

## **Department of Agriculture**

### **Program Educational Objectives (PEO)**

**Program Name: - MASTER'S OF SCIENCE (AGRONOMY)**

**Program Code:- MSAGAGR**

**The program aims are**

**PEO 1.** Provide knowledge to students about tillage and different methods to prepare field for sowing the crops in the field.

**PEO 2.** Developing the skills to grow crops according to the conditions of the area/field in different parts of the country.

**PEO 3.** To make the students understand about different intercultural methods to get maximum income from the particular areas.

**PEO 4.** Making the students recognize and understand the different techniques to the farming system.

**PEO 5.** Provide the extension knowledge to the students regarding different equipment's and modern techniques in the agriculture.

### **Program Outcomes (PO)**

**Program Name: - MASTER'S OF SCIENCE (AGRONOMY)**

**Program Code:-MSAGAGR**

**After completing master program inAgronomy, a student will be able to**

**PO 1.**Providing the different methods and objectives of irrigation in relation to plant water relationship, water management in problem soils and also to know the water resources and irrigation development in India and different states.

**PO 2.** Able to study the scope of agricultural meteorology, meteorological factors in relation to crop production, crop weather calendars, weather forecasting and also about drought and general features of dynamical & statistical modelling techniques.

**PO 3.** Able to understand the basic knowledge of hardware, software, operating system, computer languages and network along with internet and its application

**PO 4.** Able to study the origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition, quality components, handling and processing of the produce for maximum production oilseed, fiber and sugar crops.

**PO 5.** Able to explore prevailing cropping systems in the country and practices to improve their productivity and also about sustainable agriculture, crop diversification and conservation agriculture.

**Program Specific outcomes (PSO)**

**Program Name: - MASTER'S OF SCIENCE (AGRONOMY )**

**Program Code:-MSAGAGR**

**PSO 1.** To make understand the students about the harmful & beneficial effects of weeds, classification of weed, herbicides & agrochemical, weed management practices in major field & horticultural crops and also about integrated weed management and cost: benefit analysis of weed management.

**PSO 2.** To impart knowledge about soil fertility and its management and to understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency, soil fertility evaluation - biological methods, soil, plant and tissue tests and managing soil health.

**PSO 3.** To understand crop growth analysis in relation to environment, lodging effects in cereals, ideotype of plant & crop modelling for desired crop yield and also about scientific principles of crop production. To study about resource conservation technology and organic farming.

**PSO 4.** To study the scope of agricultural meteorology, meteorological factors in relation to crop production, crop weather calendars, weather forecasting and also about drought and general features of dynamical & statistical modeling techniques.

**Program Name: M. Sc. Agriculture (Agronomy)**

**Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
AGR 501	Modern concepts in crop production	To understand crop growth analysis in relation to environment, lodging effects in cereals, ideotype of plant & crop modeling for desired crop yield and also about scientific principles of crop production. To study about resource conservation technology and organic farming.
AGR 502	Principles and practices of weed management	To understand the harmful & beneficial effects of weeds, classification of weed, herbicides & agrochemical, weed management practices in major field & horticultural crops and also about integrated weed management and cost: benefit analysis of weed management.
SSC503	Soil fertility and fertilizer	To impart knowledge about soil fertility and its management and to understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency, soil fertility evaluation - biological methods, soil, plant and tissue tests and managing soil health.
STATAS - 504	Statistical methods	To gain the knowledge of signification and scope of statistics, data collection and presentation, measure of central tendency, variability and correlation & regression of statistics in agricultural science.
ENG 505	Technical writing and communication skills	To enhance the communication and writing skills of Curricula vitae, note making, report writing and vocabulary and also gain the knowledge of precise writing.
<b>Semester II</b>		
AGR-506	Agronomy of major cereals and pulses	To study the origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition, quality components, handling and processing of the produce for maximum production of rabi and kharif cereal crops, millets and pulse crops.
AGR 507	Principles and practices of water management	To provide the different methods and objectives of irrigation in relation to plant water relationship, water management in problem soils and also to know the water resources and irrigation development in

		India and different states.
AGR 508	Fundamentals of agricultural meteorology	To study the scope of agricultural meteorology, meteorological factors in relation to crop production, crop weather calendars, weather forecasting and also about drought and general features of dynamical & statistical modeling techniques.
SSC509	Analytical techniques and instrumental methods in Soil and plant analysis	To skill the students about soil sampling, commonly used instruments– their working, preparations of common analytical reagents for qualitative and quantitative analysis of both soil as well as plant samples.
STATAS 510	Experimental design	To gain the knowledge of signification and scope of statistics, test of hypothesis, analysis of variance, analysis of covariance, partitioning of degree of freedom and basic principles of design.
COMP -511	Fundamentals of information technology	To understand the basic knowledge of hardware, software, operating system, computer languages and network along with internet and its application.
<b>Semester-III</b>		
SSC512	Soil erosion and conservation	To enable students to understand various types of soil erosion and measures to be taken for controlling soil erosion to conserve soil & water and also about watershed management, water harvesting and recycling.
AGR 513	Cropping systems and sustainable agriculture	To acquaint the students about prevailing cropping systems in the country and practices to improve their productivity and also about sustainable agriculture, crop diversification and conservation agriculture.

AGR514	Agronomy of oilseed, fiber and sugar crops	To study the origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition, quality components, handling and processing of the produce for maximum production oilseed, fiber and sugar crops.
<b>Semester-IV</b>		
AGR- 515	Principles and practices of organic farming	To aware the students about organic farming in context to the use of bio-fertilizers, bio-pesticides, manures and vermicompost for the production of agricultural crops and crop residue management and also about marketing and export potential, inspection, certification, labeling & accreditation procedures of organic produce.
AGR- 516	Dryland farming and watershed management	To teach the basic concepts and practices of dry land farming, soil moisture conservation and crop planning for erratic and aberrant weather conditions.

### **Program Educational Objectives (PEO)**

**Program Name: - MASTER'S OF SCIENCE (HORTICULTURE - FRUIT SCIENCE)**

**Program Code:-MSAGFSC**

**The program aims are**

**PEO 1.** Provide knowledge to students about training and pruning of different tropical, sub tropical and temperate fruits.

**PEO 2.** Developing the skills to grow fruits crops according to the conditions of the area/field in different parts of the country.

**PEO 3.** To make the students understand about different multiplication methods to fruits crops.

**PEO 4.** Making the students recognize and understand about how to develop the orchard.

**PEO 5.** Provide the extension knowledge to the students regarding different equipment's used for intercultural operation in fruits crops.

### **Program Outcomes (PO)**

**Program Name: - MASTER'S OF SCIENCE (HORTICULTURE – FRUIT SCIENCE)**

**Program Code:-MSAGFSC**

**After completing master program in Horticulture, a student will be able to**

**PO 1.** Facilitate deeper understanding on carbohydrate, protein, lipids, fats vitamins and minerals, plant pigments, antioxidant and phyto-chemicals role in various horticultural crops.

**PO 2.** Facilitate deeper understanding on maturity, ripening, quality management, storage, packaging, drying, dehydration, utilization of fruit and vegetable processing waste and marketing and export of fresh and processed products of fruits and vegetables.

**PO3.** Understand the principles, theoretical aspects and developing skills in protected cultivation of fruit crops and to develop understanding of organic horticulture production system.

**PO 4.** Gain the knowledge of signification and scope of statistics, data collection and presentation, measure of central tendency, variability and correlation & regression of statistics in agricultural science.

**PO 5.** Impart knowledge about soil fertility and its management and to understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency, soil fertility evaluation - biological methods, soil, plant and tissue tests and managing soil health.

**PO 6.** Impart knowledge about the nutritive value of different fruit crops, nutritional disorders, evaluation of nutrient status in orchards.

### **Program Specific Outcomes (PSO)**

**Program Name: - MASTER'S OF SCIENCE (FRUIT SCIENCE)**

**Program Code:-MSAGFSC**

**PSO 1.** Facilitate deeper understanding on maturity, ripening, quality management, storage, packaging, drying, dehydration, utilization of fruit and vegetable processing waste and marketing and export of fresh and processed products of fruits and vegetables.

**PSO 2.**Facilitate deeper understanding on carbohydrate, protein, lipids, fats vitamins and minerals, plant pigments, antioxidant and phyto-chemicals role in various horticultural crops.

**PSO 3.**Educate about the scope and perspective of protected cultivation, Problem of growing fruit crops their remedies and insect, pest and disease management in protected structures.

**PSO 4.** Provide the knowledge of organic farming in context of importance, principles, perspective, concept, component of organic production of fruit crops and methods for enhancing soil health and fertility.

**PSO 5.** Provide deep knowledge of the role of genetics, breeding systems and methods, tissue culture and also biotechnological techniques and molecular breeding in relation to improvement in fruit crops.

**PSO 6.** Study about procedure for release of new varieties and different IPR acts like PPV& FR.

### **M.Sc. Agriculture (Horticulture – Fruit Science)**

#### **Outcomes**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
<b>Semester-I</b>		
<b>FSC 501</b>	Tropical fruits	To provide deep knowledge of the importance, origin, botany, taxonomy, climatic and soil requirement, improved varieties/hybrids, seed rate and seed treatment, sowing/planting time and method of fertilizer and irrigation requirement, intercultural operations and weed control, physiological disorders, plant protection measures, harvesting and post-harvest management of tropical fruit crops.
<b>FSC 502</b>	Subtropical fruits	To introduce the key concepts, practices and practical knowledge of production technology and also postharvest management of winter season vegetables crops.
<b>SSC- 503</b>	Soil fertility and fertilizer	To impart knowledge about soil fertility and its management and to understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency, soil fertility evaluation - biological methods, soil, plant and tissue tests and managing soil health.
<b>STATAS -504</b>	Statistical Methods	To gain the knowledge of signification and scope of statistics, data collection and presentation, measure of central tendency, variability and correlation & regression

		of statistics in agricultural science.
<b>ENG 505</b>	<b>TECHNICAL WRITING AND COMMUNICATION SKILLS</b>	To enhance the communication and writing skills of Curricula vitae, note making, report writing and vocabulary and also gain the knowledge of precise writing.
<b>Semester-II</b>		
<b>FSC 506</b>	Temperate fruits and nuts	To introduce the key concepts, practices and practical knowledge of production technology and also postharvest management of temperate fruit crops.
<b>FSC 507</b>	Propagation and nursery management for fruit crops	To facilitate deeper understanding on the propagation techniques, nursery raising techniques, raising virus free seedlings.
<b>FSC 508</b>	Breeding of fruit crops	To provide deep knowledge of the role of genetics, breeding systems and methods, tissue culture and also biotechnological techniques and molecular breeding in relation to improvement in fruit crops.
<b>SSC 509</b>	Analytical techniques and instrumental methods in Soil and plant analysis	To skill the students about soil sampling, commonly used instruments– their working, preparations of common analytical reagents for qualitative and quantitative analysis of both soil as well as plant samples.
<b>STATAS 510</b>	Experimental Design	To gain the knowledge of signification and scope of statistics, test of hypothesis, analysis of variance, analysis of covariance, partitioning of degree of freedom and basic principles of design.
<b>COMP -511</b>	Fundamentals of Information Technology	To understand the basic knowledge of hardware, software, operating system, computer languages and network along with internet and its application.
<b>Semester-III</b>		
<b>FSC 512</b>	Biodiversity and conservation of fruit crops	To provide deep knowledge of the principles of biodiversity and strategies in germplasm conservation of fruit crops, plant quarantine, GIS and documentation of local biodiversity.
<b>FSC 514</b>	Nutrition of fruit crops	To impart knowledge about the nutritive value of different fruit crops, nutritional disorders, evaluation of nutrient status in orchards
<b>FSC 515</b>	Orchard management	To educate about harvesting, disposal and marketing of orchard produce, theoretical aspects ,cropping systems and developing skills in orchard management of fruit crops.
<b>FBC-513</b>	Food biochemistry	To facilitate deeper understanding on carbohydrate, protein, lipids, fats vitamins and minerals, plant

		pigments, antioxidant and phyto-chemicals role in various horticultural crops.
<b>Semester-IV</b>		
PHT 516	Postharvest technology of fruit and vegetable crops	To facilitate deeper understanding on maturity, ripening, quality management, storage, packaging, drying, dehydration, utilization of fruit and vegetable processing waste and marketing and export of fresh and processed products of fruits and vegetables
FSC 517	Protected cultivation and organic horticulture	Understanding the principles, theoretical aspects and developing skills in protected cultivation of fruit crops and to develop understanding of organic horticulture production system.

### **Program Educational Objectives (PEO)**

**Program Name: - MASTER'S OF SCIENCE (GENETICS AND PLANT BREEDING)**

**Program Code:-MSAGGPB**

#### **The program aims are**

**PEO 1.** To make learn the students about different cell organelles genomic structure under the unit of cell biology and genetics. Students known about different types of lowers plants such as algae, fungi, Bryophyte pteridophyta that indicates the evolution in plants.

**PEO2.** To analyzes the historical evolution of plant breeding, knowing which have been the key scientific and technical advances that have influenced its development or accelerated it sresults.

**PEO 3.** To know the different plant reproduction systems, how they affect genetic variability and how they condition the strategies and processes of selection and breeding.

**PEO 4.** To give a deeper insight into the genetic basis supporting plant breeding, from the individual gene to the complete genome.

**PEO 5.** To familiarize with the aim of the genome analysis projects of certain model plant species and the possibilitie suffered by their comparison with the genomes of other species of agronomic interest.

**PEO6.** To Understand the importance of identifying genes, isolating them, determining their function and controlling their expression.

### **Program Outcomes (PO)**

**Program Name: - MASTER'S OF SCIENCE(GENETICS AND PLANT BREEDING)**

**Program Code:-MSAGGPB**

**After completing master program in Genetics and Plant Breeding, a student will be able to**

**PO 1.** Impart theoretical knowledge and practical skills about plant breeding objectives, modes of reproduction and genetic consequences, breeding methods for crop improvement.

**PO 2.** Gain the knowledge of signification and scope of statistics, data collection and presentation, measure of central tendency, variability and correlation & regression of statistics in agricultural science.

**PO 3.**Have an insight into structure and functions of chromosomes, chromosome mapping, polyploidy and cytogenetic aspects of crop evolution.

**PO 4.** Impart theoretical knowledge and computation skills regarding component of variation and variances, scales, mating designs and gene effects.

**PO 5.** Have knowledge in theory and practice about cell structure, organelles and their functions, molecules like proteins and nucleic acids.

**PO 6.** Apprise about various abiotic and biotic stresses influencing crop yield, mechanisms and genetics of resistance and methods to breed stress resistant varieties.

### **Program Specific Outcomes (PSO)**

**Program Name: - MASTER'S OF SCIENCE (GENETICS AND PLANT BREEDING)**

**Program Code:-MSAGGPB**

**PSO1.**Students are able to know about characteristic of various plants and classification of different plant groups to understand the different taxonomic group and evolutionary.

**PSO 2.**Determine economic in agricultural plant.

**PSO 3.**Understand the environments and basic concept of taxonomy, ecology and analysis the relationship between plant species.

**PSO 4.**Understand the plant disease, chemical properties and evolutionary relationship among taxonomic groups.

**PSO 5.**Utilize scientific methods to explore natural phenomena along with the development of a solid foundation in agricultural botany.

**PSO 6.** Develops basic laboratory skills necessary for agricultural research coupled with the knowledge in molecular biology to qualify for upper divisional study.

### **M. Sc. Agriculture (Genetics and Plant Breeding)**

#### **Outcomes**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
<b>Semester-I</b>		
GPB501	Principles of genetics	This course is aimed at understanding the basic concepts of genetics, helping students to develop their analytical, quantitative and problem solving skills from classical to molecular genetics.
GPB 502	Principles of plant breeding	To impart theoretical knowledge and practical skills about plant breeding objectives, modes of reproduction and genetic consequences, breeding methods for crop improvement.
GPB 503	Principles of cytogenetics	To provide insight into structure and functions of chromosomes, chromosome mapping, polyploidy and cytogenetic aspects of crop evolution.
STATAS -504	Statistical methods	To gain the knowledge of signification and scope of statistics, data collection and presentation, measure of central tendency, variability and correlation & regression of statistics in agricultural science.
ENG 505	TECHNICAL WRITIG AND COMMUNICATION SKILLS	To enhance the communication and writing skills of Curricula vitae, note making, report writing and vocabulary and also gain the knowledge of precise writing.
<b>Semester-II</b>		
GPB 506	Principles of quantitative genetics	To impart theoretical knowledge and computation skills regarding component of variation and variances, scales, mating designs and gene effects
GPB 507	Mutagenesis and mutation breeding	To impart the knowledge about general principles of radiation and various tests/methods for detection of radiation effects on the living cells, genetic risks involved and perspectives of advances made.
GPB 508	Cell biology and molecular genetics	To impart knowledge in theory and practice about cell structure, organelles and their functions, molecules like proteins and nucleic acids.
SST-509	Principles of seed production	To introduce the basic principles of quality seed production.
STATAS 510	Experimental design	To gain the knowledge of signification and scope of

		statistics, test of hypothesis, analysis of variance, analysis of covariance, partitioning of degree of freedom and basic principles of design.
COMP -511	Fundamentals of information technology	To understand the basic knowledge of hardware, software, operating system, computer languages and network along with internet and its application.
<b>Semester-III</b>		
GPB 512	Breeding for biotic and abiotic stress resistance	To apprise about various abiotic and biotic stresses influencing crop yield, mechanisms and genetics of resistance and methods to breed stress resistant varieties.
GPB 514	Biotechnology for crop improvement	To impart knowledge and practical skills to use biotechnological tools in crop improvement.
GPB 513	Heterosis breeding	To provide understanding about mechanisms of heterosis and its exploitation for yield improvement through conventional and biotechnological approaches.
<b>Semester-IV</b>		
GPB 515	Maintenance breeding and concepts of release varieties	To appraise the students about the variety deterioration and steps to maintain the purity of varieties & hybrids and principles of seed production in self and cross pollinated crops.
GPB 516	Breeding for quality traits	To provide insight into recent advances in improvement of quality traits in rice, millets, legumes, oilseeds and forage crops and for physiological efficiency using conventional and modern biotechnological approaches.

### **Program Educational Objectives (PEO)**

**Program Name: - MASTER'S OF SCIENCE (SOIL SCIENCE & AGRICULTURAL CHEMISTRY)**

**Program Code:-MSAGSSC**

**The program aims are**

**PEO 1.** To provide knowledge about basic structure of clay minerals and genesis of clay minerals; soil genesis in terms of factors and soil forming process, and to enable students conduct soil survey, interpret soil survey reports in terms of land use planning and knowledge about soils of India.

**PEO 2.**To impart knowledge about soil physics, physical characterization of soil, flow of water in soil; saturated and unsaturated flow, entry of water into soil and its redistribution, Soil aeration and to understand about soil physics in relation to plants.

**PEO 3.**To impart knowledge about soil fertility and its management and to understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency, soil fertility evaluation - biological methods, soil, plant and tissue tests and managing soil health.

**PEO 4.**To proficiency the students about problematic soils in the country and their management through different methods, quality of irrigation water and management.

**PEO 5.**To expertise students to understand various types of soil erosion and measures to be taken for controlling soil erosion to conserve soil and Watershed management.

### **Program Outcomes (PO)**

**Program Name: - MASTER'S OF SCIENCE (SOIL SCIENCE & AGRICULTURAL CHEMISTRY)**

**Program Code:-MSAGSSC**

**After completing master program in Soil Science & Agricultural Chemistry, a student will be able to**

**PO 1.** Familiarize with the soil biota, microbial activity, microbial transformations of nitrogen, phosphorus, sulphur, iron and manganese in the soil and their importance in sustainable crop production.

**PO 2.** Understand about the manures and fertilizers production and their importance in sustainable crop production, long term effect of manures and fertilizers on soil and integrated nutrient management.

**PO 3.** Learning deeper understanding about soil and water resources, pollution and its impact on agricultural crops and management of soil and water pollution; physical, chemical and biological remediation of soil and water pollution, waste water treatment.

**PO 4.** Gain the knowledge of signification and scope of statistics, test of hypothesis, analysis of variance, analysis of covariance, partitioning of degree of freedom and basic principles of design.

**PO 5.**Make the students skilled about soil sampling, commonly used instruments– their working, preparations of common analytical reagents for qualitative and quantitative analysis of both soil as well as plant samples.

**PO 6.** Make the students proficient about problematic soils in the country and their management through different methods, quality of irrigation water and management.

### **Program Specific Outcomes (PSO)**

**Program Name: - MASTER'S OF SCIENCE (Soil Science & Agricultural Chemistry)**

**Program Code :- MSAGSSC**

**PSO 1.** Expertise the students to understand various types of soil erosion and measures to be taken for controlling soil erosion to conserve soil and watershed management.

**PSO 2.** Learning of deeper understanding about soil and water resources, pollution and its impact on agricultural crops and management of soil and water pollution.

**PSO 3.** Familiarization with the physical, chemical and biological remediation of soil and water pollution, waste water treatment.

**PSO 4.** Familiarity with the soil biota, microbial activity, microbial transformations of Nitrogen, Phosphorus, Sulphur and Iron.

**PSO 5.** Awareness regarding the importance of manganese in the soil and their importance in sustainable crop production. Also the awareness about the manures and fertilizers production.

**PSO 6.** Importance in sustainable crop production, long term effect of manures and fertilizers on soil and integrated nutrient management.

### **M.Sc Ag. Soil Science & Agricultural Chemistry**

#### **Outcomes**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
<b>Semester I</b>		
SSC- 501	Soil Mineralogy, Genesis, Classification and Survey	To provide knowledge about basic structure of clay minerals and genesis of clay minerals; soil genesis in terms of factors and soil forming process, and to enable students conduct soil survey, interpret soil survey reports in terms of land use planning and knowledge about soils of India.
SSC- 502	Fundamentals of soil physics	To impart knowledge about soil physics, physical characterization of soil, flow of water in soil; saturated and

		unsaturated flow, entry of water into soil and its redistribution, Soil aeration and to understand about soil physics in relation to plants.
SSC- 503	Soil fertility and fertilizer	To impart knowledge about soil fertility and its management and to understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency, soil fertility evaluation - biological methods, soil, plant and tissue tests and managing soil health.
STATAS - 504	Statistical methods	To gain the knowledge of signification and scope of statistics, data collection and presentation, measure of central tendency, variability and correlation & regression of statistics in agricultural science.
ENG- 505	TECHNICAL WRITING AND COMMUNICATION SKILLS	To enhance the communication and writing skills of Curricula vitae, note making, report writing and vocabulary and also gain the knowledge of precise writing.
<b>Semester II</b>		
AGR-506	Agronomy of major cereals and pulses	To provide knowledge about the Origin and history, area and production, classification, improved varieties, adaptability, climate, soil, water and cultural requirements, nutrition, quality components, handling and processing of cereals and pulse crops.
SSC- 507	Soil chemistry	To impart knowledge about the soil chemistry, elemental composition of the earth's crust and soils, soil colloids, Ion exchange processes in soil and its relation to plant growth and development.
SSC- 508	Management of problem soils and water	To proficiency the students about problematic soils in the country and their management through different methods, quality of irrigation water and management.
SSC- 509	Analytical techniques and instrumental methods in Soil and plant analysis	To skill the students about soil sampling, commonly used instruments– their working, preparations of common analytical reagents for qualitative and quantitative analysis of both soil as well as plant samples.
STATAS 510	Experimental design	To gain the knowledge of signification and scope of statistics, test of hypothesis, analysis of variance, analysis of covariance, partitioning of degree of freedom and basic principles of design.
COMP- 511	Fundamentals of information technology	To understand the basic knowledge of hardware, software, operating system, computer languages and network along with internet and its application.
<b>Semester III</b>		
SSC- 512	Soil Erosion and	To expertise students to understand various types of soil

	Conservation	erosion and measures to be taken for controlling soil erosion to conserve soil and Watershed management.
SSC- 513	Soil and water pollution	To learning deeper understanding about soil and water resources, pollution and its impact on agricultural crops and management of soil and water pollution; Physical, chemical and biological remediation of soil and water pollution, waste water treatment.
SSC- 514	Agronomy of oil seed, fibre and sugar crops	To teach the Origin and history, area and production, classification, improved varieties, adaptability, climatic, soil, nutrient, water, cultural requirements, weed management, quality components, handling and processing of oilseed, fiber and sugar crops.
<b>Semester IV</b>		
SSC- 515	Soil microbiology	To familiarity the soil biota, microbial activity, microbial transformations of nitrogen, phosphorus, sulphur, iron and manganese in the soil and their importance in sustainable crop production.
SSC- 516	Manures and fertilizers	To awareness about the manures and fertilizers production and their importance in sustainable crop production, long term effect of manures and fertilizers on soil and integrated nutrient management.

### **Program Educational Objectives (PEO)**

**Program Name: - MASTER'S OF SCIENCE (HORTICULTURE - VEGETABLE SCIENCE)**

**Program Code:-MSAGVSC**

**The program aims are**

**PEO1.**To introduce learners the key concepts, practices and practical knowledge of production technology and also postharvest management of winter season vegetables crops.

**PEO 2.** To pioneer student the explanation of the concept and physiology of growth and development of vegetable crops and also Plant growth regulators in relation to vegetable production.

**PEO 3.** To teach morphological, cytological and molecular taxonomy of different families, genera and species of vegetable crops.

**PEO 4.** To impart knowledge about soil fertility and its management and to understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency, soil fertility evaluation - biological methods, soil, plant and tissue tests and managing soil health.

**PEO 5.** To introduce the key concepts, practices and practical knowledge of production technology and also postharvest management of winter season vegetables crops

### **Program Outcomes (PO)**

**Program Name: - MASTER'S OF SCIENCE (HORTICULTURE - VEGETABLE SCIENCE)**

**Program Code:-MSAGVSC**

**After completing master program in Horticulture, a student will be able to**

**PO 1.** Introduction of learners to the key concepts, practices and practical knowledge of production technology and also postharvest management of winter season vegetable crops.

**PO 2.** The students pioneered the explanation of the concept and physiology of growth and development of vegetable crops and also Plant growth regulators in relation to vegetable production.

**PO 3.** Able to understand the morphological, cytological and molecular taxonomy of different families, genera and species of vegetable crops.

**PO 4.** Able to gain the knowledge of signification and scope of statistics, data collection and presentation, measure of central tendency, variability and correlation & regression of statistics in agricultural science.

**PO 5.** Introduction of students to the knowledge about soil fertility and its management and to understand the role of fertilizers and manures in supplying nutrients .

**PO 6.** Enable the learners about the importance, principles, methods of quality seed and planting material production in vegetable crops and the recent trends in the certification, processing and storage of vegetable crops.

### **Program Specific Outcomes (PSO)**

**Program Name: - MASTER'S OF SCIENCE (VEGETABLE SCIENCE)**

**Program Code:-MSAGVSC**

**PSO 1.** Facilitate deeper understanding on maturity, ripening, quality management, storage, packaging, drying, dehydration, utilization of fruit and vegetable processing waste and marketing and export of fresh and processed products of fruits and vegetables.

**PSO 2.** Facilitate deeper understanding on carbohydrate, protein, lipids, fats vitamins and minerals, plant pigments, antioxidant and phyto-chemicals role in various horticultural crops.

**PSO 3.** Educate about the scope and perspective of protected cultivation, Problem of growing vegetable crops their remedies and insect, pest and disease management in protected structures.

**PSO 4.** Provide the knowledge of organic farming in context of importance, principles, perspective, concept, component of organic production of vegetable crops and methods for enhancing soil health and fertility.

**PSO 5.** Provide deep knowledge of the role of genetics, breeding systems and methods, tissue culture and also biotechnological techniques and molecular breeding in relation to improvement in vegetable crops.

**PSO 6.** Study about procedure for release of new varieties and different IPR acts like PPV& FR.

### **M. Sc. Agriculture (Horticulture - Vegetable Science)**

**Outcomes**

Course Code	Course	Course Outcome
<b>Semester I</b>		
VSC-501	Production technology of winter season vegetable crops	To introduce learners the key concepts, practices and practical knowledge of production technology and also postharvest management of winter season vegetables crops.
VSC-502	Growth and development of vegetable crops	To pioneer student the explanation of the concept and physiology of growth and development of vegetable crops and also Plant growth regulators in relation to vegetable production.
VSC-506	Systematic of vegetable crops	To teach morphological, cytological and molecular taxonomy of different families, genera and species of vegetable crops.
SSC- 503	Soil fertility and fertilizer	To impart knowledge about soil fertility and its management and to understand the role of fertilizers and manures in supplying nutrients to plants so as to achieve high fertilizer use efficiency, soil fertility evaluation - biological methods, soil, plant and tissue tests and managing soil health.
STATAS - 504	Statistical Methods	To gain the knowledge of signification and scope of statistics, data collection and presentation, measure of central tendency, variability and correlation & regression of statistics in agricultural science.
ENG- 505	TECHNICAL WRITIG AND COMMUNICATION SKILLS	To enhance the communication and writing skills of Curricula vitae, note making, report writing and vocabulary and also gain the knowledge of precise writing.
<b>Semester II</b>		

VSC-507	Production technology of summer season vegetable crops	To introduce the key concepts, practices and practical knowledge of production technology and also postharvest management of winter season vegetables crops
VSC-508	Breeding of vegetable crops	To provide deep knowledge of the role of genetics, breeding systems and methods, tissue culture and also biotechnological techniques and molecular breeding in relation to improvement in vegetable crops and also to study about procedure for release of new varieties and different IPR acts like PPV& FR
VSC-512	Seed production technology of vegetable crops	To give notice the students about importance, principles, methods of quality seed and planting material production in vegetable crops and the recent trends in the certification, processing and storage of vegetable crops
SSC- 509	Analytical techniques and instrumental methods in Soil and plant analysis	To skill the students about soil sampling, commonly used instruments– their working, preparations of common analytical reagents for qualitative and quantitative analysis of both soil as well as plant samples.
STATAS 510	Experimental Design	To gain the knowledge of signification and scope of statistics, test of hypothesis, analysis of variance, analysis of covariance, partitioning of degree of freedom and basic principles of design.
COMP-511	Fundamentals of Information Technology	To understand the basic knowledge of hardware, software, operating system, computer languages and network along with internet and its application
<b>Semester III</b>		
VSC-515	Production technology of under exploited and underutilized vegetable crops	To provide deep knowledge of the importance, origin, botany, taxonomy, climatic and soil requirement, improved varieties/hybrids, seed rate and seed treatment, sowing/planting time and method of fertilizer and irrigation requirement, intercultural operations and weed control, physiological disorders, plant protection measures, harvesting and post-harvest management of under exploited and underutilized vegetable crops
VSC-514	Forcing techniques and organic vegetable production technology	To educate the scope and perspective of protected cultivation, Problem of growing vegetable crops their remedies and insect, pest and disease management in protected structures and also provide the knowledge of organic farming in context of importance, principles, perspective, concept, component of organic production of vegetable crops and methods for enhancing soil health and

		fertility
FBC-513	Food Biochemistry	To facilitate deeper understanding on carbohydrate, protein, lipids, fats vitamins and minerals, plant pigments, antioxidant and phyto-chemicals role in various horticultural crops.
<b>Semester IV</b>		
VPHT 516	Postharvest technology of fruit and vegetable crops	To facilitate deeper understanding on maturity, ripening, quality management, storage, packaging, drying, dehydration, utilization of fruit and vegetable processing waste and marketing and export of fresh and processed products of fruits and vegetables

## **B.Sc. (Hons) Agriculture**

### **Under Graduate Program**

#### **Program Educational Objectives (PEO)**

**Program Name: - BACHELOR OF SCIENCE (Hons.) AGRICULTURE**

**Program Code:- BSHAG**

The program aims are

- PEO1:** B.Sc. (Hons.) Agriculture programmes aim towards: Imparting detailed knowledge of Agriculture and its allied branches
- PEO2:** To impart quality education in rural and urban area of India and Punjab.
- PEO3:** Development of technical manpower in the field of agriculture to cater the need of government, corporate, NGOs research organizations, etc. both in India and abroad.
- PEO4:** Exposure of the students to new/innovative techniques used in the field of Agriculture.
- PEO5:** Students will demonstrate an understanding of and appreciation for the importance of the impact of globalization and diversity in modern agriculture organizations.

#### **Program Outcomes (PO) For Under Graduate Program**

**Program Name: - BACHELOR OF SCIENCE (Hons.) AGRICULTURE**

**Program Code:- BSHAG**

After completing undergraduate program in agriculture studies, a student will be able to-

- PO1:** Facilitating detailed study of various agriculture forestry, Livestock and other allied branches
- PO2:** Required to raise the income of farmers providing detailed knowledge of agriculture in India and Indian farmers income generating

- PO3:** Enterprises Knowledge dissemination regarding various technique of farming and farming system in India
- PO4:** Study of market and marketing of agricultural produce.
- PO5:** Achieve higher levels of verbal and non-verbal communication and presentation skills in the agriculture sector.
- PO6:** Gain demonstrates critical thinking and problem solving skills as they apply to a variety of animal and or plant production systems.
- PO7:** Develop a foundation for pursuing higher education in the field of Agriculture

### **Program Specific Objectives (PSO)**

**Program Name: - BACHELOR OF SCIENCE (Hons.) AGRICULTURE**

**Program Code:- BSHAG**

- PSO1:** To know about basic knowledge of agriculture related to revolution, institutes and new technology. Diversification in crop production, impact of climatic factors and weather hazards on crops, livestock distribution and production & to study the agronomical practices of field crops and forage crops.
- PSO2:** To learn about elementary knowledge of soil composition, soil forming factors, soil profile, soil physical properties, taxonomical classification, different methods and objectives of irrigation in relation to plant water relationship, application of essential plant nutrient, deficiency and their toxicity symptoms & to study the different soil testing methods and reclamation techniques of problematic soils.
- PSO3:** To enhance the knowledge of principles and laws of economics in the field of agriculture in relation to study the behaviour of consumer and producer in competitive firms of agriculture marketing & to aware the students about the importance of Agribusiness in the Indian Economy.
- PSO4:** To provide basic knowledge of horticultural branches and their scope, about importance, horticultural divisions, agro-climatic zones, planting systems, propagation methods and cultivation practices of major and minor fruit crops along with the practical knowledge of training and pruning methods & to provide knowledge about importance, harvesting and processing of ornamental plants, medicinal and aromatic crops.
- PSO5:** To extend the scientific knowledge of researcher to the farmers through different extension programs (Visits, training and seminars) organized by different government and non-governmental organization, knowledge of social groups, stratification, social institution,

social chain and significance of rural sociology in agricultural extension & knowledge about leadership, attitude and roll of psychology in management of stress and farmer suicide.

**PSO6:** To understand the importance of physiological and harvestable maturity of seeds, seed structures, morphological and biochemical changes occurring during seed development.

**PSO7:** To understand the morphology, taxonomic classification and anatomy of insect-pest & about introduction of insect ecology, their biotic potential, environmental resistance and causes of pest outbreaks along with pest surveillance, forecasting and control measures & to study about the integrated management of diseases of horticultural crops.

**PSO8:** To study the concept of silviculture, forestry, Role of forests, forest types, regeneration of forests, agro-forestry, classification of agro-forestry & social forestry system.

**PSO9:** To provide knowledge about Plant Tissue Culture, Plant Genetic Engineering, Somatic embryogenesis and synthetic seed. To provide primary knowledge of the role of gene/DNA in agriculture crops through studying basic principles of Mendel's laws.

**PSO10:** To aware the students about organic farming in context to the use of bio-fertilizers, bio-pesticides, manures and vermicompost for the production of agricultural crops. Organic produce quality considerations, certification, labelling, accreditation process and marketing of agricultural produce.

### Learning outcomes for the agriculture undergraduate program

Course Code	Course	Course Outcome
<b>Semester-I</b>		
AGR-111	Introductory Agriculture	To know about basic knowledge of agriculture related revolution, institutes and new technology.
AGM-112	Introductory Agro-meteorology	To study the impact of climatic factors and weather hazards on crops, livestock distribution and production.
MBL-113	Elementary Microbiology	To study the history, application, discovery and role of different micro-organism in agriculture and also to study the role of microbes C, N, P and S cycles.
SSC-114	Introduction to Soil Science	To learn about elementary knowledge of soil composition, soil forming factors, soil profile, soil physical properties and taxonomical classification in relation to soils of Punjab and Indian context.
AGE-115	Principles Agricultural	To enhance the knowledge of principles and laws

	Economics	of economics in the field of agriculture in relation to study the behaviour of consumer and producer in competitive firms of agriculture marketing.
BOT-116	Basic Botany	To study the systematic and taxonomical classification of different plant kingdom along with their morphological and anatomical characteristics.
MAT - 116	Basic Mathematics	To gain the knowledge of complex number, sequence & series, arithmetic & geometric mean also learn about binomial theorem and trigonometry.
ENG -117	English Communication Skills	To enhance the communication and writing skills of Curricula vitae, note making, report writing and vocabulary and also gain the knowledge of poetry and prose section.
FSC-119	Fundamentals of Horticulture	To provide basic knowledge of horticultural branches and their scope and also enhance the knowledge about horticultural and botanical classification, different zones, propagation methods, irrigation and fertigation application in relation to horticultural crops.
GPB-118 / BPB-118	Basic Punjabi/ Compulsory Punjabi	To keep in touch the students of Punjab and other states with the basic knowledge of Punjabi language (Mother tongue of Punjab)
<b>Semester-II</b>		
AGR- 121	Water Management and Micro Irrigation	To provide the different methods and objectives of irrigation in relation to plant water relationship and also to know the water resources and irrigation development in India and Punjab.
EXT-122	Dimensions of Agricultural Extension	To extend the scientific knowledge of researcher to the farmers through different extension programs (Visits, training and seminars) organized by different government and non-governmental organization.
PBG-123	Principles of Genetics	To provide primary knowledge of the role of gene/DNA in agriculture crops through studying basic principles of Medals, cell structure, chromosomal structure, DNA structure, gene expression and chromosomal aberrations.
SSC-124	Soil Chemistry, Soil Fertility and Nutrient Management	To ponder about the question related to application of essential plant nutrient, deficiency and their toxicity symptoms and to study the different soil testing methods and reclamation

		techniques of problematic soils.
VSC-125	Vegetable Production Technology	To know the origin, classification, area, production, nursery raising and cultivation practices of various vegetable crops.
MAT - 127	Basic Mathematics-II	To gain the knowledge of function, evaluation of algebraic limits, continuity, integration and derivatives.
ZOO -127	Basic Zoology	To study about the prokaryotic and eukaryotic cell, tissue and binomial nomenclature, classification and general survey of animal kingdom.
GPB-128/ BPB-128	Basic Punjabi/ Compulsory Punjabi	To keep in touch the students of Punjab and other states with the basic knowledge of Punjabi language (Mother tongue of Punjab)
ICA -126	Introduction to Computer application	To understand the basic knowledge of hardware, software, operating system, computer languages and network along with internet and its application.
EVS -129	Environment and Road Safety Awareness	To impart the knowledge about natural resources, ecosystem, biodiversity, various types of environmental pollution, road safety awareness and stubble burning.
DAS -130	Drug Abuse: Problem, Management and Prevention	To impart knowledge about different problems, effects, symptoms, causes, consequences, management and prevention of drug abuse.
<b>Semester-III</b>		
AGR- 211	Principles of Agronomy (Kharif Crops)	To study the agronomical practices of cereal crops, millets, pulse crops, fibre crops, oilseed crops and forage crops and to know about the scope and importance of agronomy, tillage practice, cropping systems and planting geometry.
BOT-212	Crop Physiology	To understand the importance of physiological and harvestable maturity of seeds, seed structures and morphological and biochemical changes occurring during seed development along with the basic physiological processes of C <sub>3</sub> , C <sub>4</sub> and CAM plants.
ENT-213	Insect Morphology and Systematics	To understand the morphology, taxonomic classification and anatomy of insect-pest and to study the modification and function of different parts of insect.
EXT-214	Extension Methodologies and Communication Skills	To study the principles and programme development process of extension programmes with innovative information sources and audio visual aids and scope

	for Transfer of Technology	and importance of journalism.
AEN-215	Farm Power and Machinery	To gain the knowledge different farm resources, working principles of two stroke /four stroke engine, tractor, pumps and farm implements.
SSC-216	Manures and Fertilizers	To study the concept of essential plant nutrients, classification and manufacturing of manures and fertilizers along with the merits and demerits of bio-fertilizers.
FSC-217	Production technology of fruit crops	To provide knowledge about importance, horticultural divisions, agro-climatic zones, planting systems, propagation methods and cultivation practices of major and minor fruit crops.
SSC-218	Soil physics and erosion management	To study about the soil water potential, water table, soil- plant-atmosphere continuum, plant water indices, soil moisture, erosion and conservation measures.
PPL-219	Plant pathogens and principles of plant pathology	To understand the importance and general characters of fungi, bacteria, viruses, algae and protozoa in context to the plant diseases and their management.
<b>Semester-IV</b>		
AGR-221	Principles of Agronomy-II (Rabi Crops)	To study the origin, geographic distribution, botanical description, economic importance, soil and climatic requirement, varieties, cultural practices, yield, major insect pest and diseases of rabi crops.
AGE-222	Production Economics, Farm Management and Agricultural Finance	To introduce the students issues related with agricultural finance, markets, food security and international trade in agricultural commodities and also extend the knowledge of recent development in Indian agriculture.
ENT-223	Insect Ecology and Integrated Pest Management	To study focus on introduction of insect ecology, their biotic potential environmental resistance and causes of pest outbreaks along with pest surveillance, forecasting and control measures.
LPM-224	Livestock Production and Management	To provide knowledge regarding breeds of cattle, buffalo, sheep, goat and swine in India and also to study the measures and factors affecting fertility in Livestock.
BOT-225	Principles of Seed Technology	To aware the students about the importance of seed production, different techniques, maintenance of genetic purity and seed certification along with the intellectual property rights.
EXT-226	Rural Sociology and	To provide the knowledge of social groups,

	Education Psychology	stratification, social institution, social chain and significance of rural sociology in agricultural extension.
PPL-227	Diseases of Field Crops and their Management	To study about the economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of field crops.
SSC-228	Organic Farming	To aware the students about organic farming in context to the use of bio-fertilizers, bio- pesticides, manures and vermicompost for the production of agricultural crops.
SSC-229	Fundamental of Soil and Water Conservation Engineering	To provide knowledge regarding surveying, levelling equipments, water harvesting, irrigation projects and conservation of soil and water.
<b>Semester-V</b>		
ZOO -501	Dairy Technology	To provide the knowledge of milk, composition of milk, physical, chemical and nutritive properties, bacteriology of milk and also to study about adulteration of milk and its detection.
STAT -502	Basic Statistics	To gain the knowledge of signification and scope of statistics, data collection and presentation, measure of central tendency, variability and correlation & regression of statistics in agricultural science.
GPB-503	Introduction to Plant Breeding	To provide primary knowledge of the role of genetics, breeding methods, tissue culture techniques in relation to crop improvement and also to study about procedure for release of new varieties.
ZOO-504	Economic Zoology and Fish Culture	To understand the importance and general characters of animals, ticks, mites, birds wild boar, bat, rodents, fish and earthworm with special references to Punjab and also to study the rearing and breeding techniques in fish farming.
AGRON-505	Rainfed Agriculture	To provide knowledge regarding drought, tolerance and management practices, selection of suitable crops, moisture conservation techniques and water shed management practices in Rainfed areas.
HORT-506	Medicinal and Aromatic Crops	To provide knowledge about importance, origin, distribution, climate and soil requirement, propagation and nursery technique, planting, cultural practices, nutritional and water requirement, plant protection, harvesting and processing of medicinal and aromatic crops.
PATH- 507	Mushroom Cultivation	To aware the students about mushroom cultivation in

		context to Morphological features, taxonomy and identification of poisonous, Hallucinogenic and medicinal mushrooms. Preparation of pure culture, spawn, substrate and storage of spawn and also to study about post harvest treatments and preservation of mushroom.
AGRON- 508	Weed Management	To understand the harmful & beneficial effects of weeds, classification of weed, herbicides and agrochemical and also to study the weed management practices in major field and horticultural crops.
<b>Semester-VI</b>		
HORT- 601	Spices and plantation crops	To provide knowledge about origin, distribution, area, production, botany, variety, climate, soil, propagation, nursery management, site selection, layout, planting, crop management, harvesting and yield of Spices and plantation crops.
HORT- 602	Post Harvest Technology of Horticultural Crops	To aware the students about the importance, scope and causes of postharvest losses and also to study the pre and post harvest factor to affect the quality of horticultural crops. Preparation of Jam, jelly, marmalade, preserve, candy, Fermented and non-fermented beverages.
PATH- 603	Diseases of fruit and vegetables crops	To study about the economic importance, symptoms, causal organism, epidemiology, disease cycle and integrated management of diseases of horticultural crops.
HORT- 604	Protected Cultivation of Horticultural Crops	To provide knowledge about greenhouse, basics of greenhouse design, different types of structures, interaction of light, temperature, humidity and CO <sub>2</sub> on crop regulation, heating, cooling, ventilation and shading in poly house and also to study the cultivation of commercial horticultural crops.
HORT-605	Landscaping and ornamental horticulture	To provide primary knowledge of the landscape, garden, edges and hedges, climbers and creepers, cacti and succulents, herbs, annuals, flower borders and beds, ground covers, carpet beds, bamboo groves, lawn, bio-aesthetic planning, eco-tourism, theme parks and indoor gardening.
ENTO-606	Agricultural Pest Management	To study about the systematic position, identification, distribution, host range, bionomics and seasonal abundance, nature and extent of damage and management of insect pest of various

		field and horticultural crops.
AGRON- 607	Farming system and Sustainable Agriculture	To aware the students about farming system, Crop diversification, Sustainable agriculture, land degradation and conservators of natural resources and visit to an organic farm to study various components and its utilization in agriculture field.
AGRON -608	Silviculture and Agro-forestry	To study the concept of silviculture, forestry, Role of forests, forest types, regeneration of forests, agro-forestry, classification of agro-forestry & social forestry system and also to provide the knowledge about cultivation of teak, sal, eucalyptus and poplar trees.
<b>Semester-VII</b>		
GEN-701	Principles of plant biotechnology	To provide knowledge about Plant Tissue Culture, Plant Genetic Engineering, Somatic embryogenesis and synthetic seed also about Blotting techniques, DNA finger printing, DNA based markers and its application in crop improvement.
GEN-702	Fundamentals of farm business management	To aware the students about the importance of Agribusiness in the Indian Economy, Agricultural Policy, Financial Management of Agribusiness, Marketing Management and also about various activities in agriculture and allied sectors: Dairying, poultry, fisheries and agro-industries.
HORT-701	Introductory horticulture	To provide basic knowledge of horticultural branches and their scope and also enhance the knowledge about horticultural and botanical classification, different zones, propagation methods, kitchen gardening, plant growth regulators, irrigation and fertigation application in relation to horticultural crops also about export and marketing of horticultural produce.
HORT-702	Protected cultivation of horticultural crops	To provide knowledge about greenhouse, basics of greenhouse design, different types of structures, interaction of light, temperature, humidity and CO <sub>2</sub> on crop regulation, heating, cooling, ventilation and shading in poly house and also to study the cultivation of commercial horticultural crops.
GPB -701	Principles of genetics	To provide knowledge of laws of Mendel, DNA structure, gene expression, linkage, extra chromosomal inheritance and fine structure of gene.
GPB- 702	Principles of plant breeding	To provide primary knowledge of principles and objectives of plant breeding, breeding methods,

		Evolution patterns in crop plants, pure line theory, pure line selection and mass selection and also to study about procedure for release of new varieties and concept of plant ideotype and its role in crop improvement.
AGRON- 701	Principles of agronomy	To study the concept of agronomy, classification, factors affecting crop production, role of manures and fertilizers, tillage and irrigation in crop production and also about zones of India and Punjab and integrated farming system.
AGRON- 703	Modern concepts in crop production	To understand crop growth analysis in relation to environment, lodging effects in cereals, ideotype of plant & crop modelling for desired crop yield and also about scientific principles of crop production.
SSC-701	Introduction to soil	To learn about elementary knowledge of soil composition, soil forming factors, soil profile, soil physical properties and classification soil structures, movement of soil water, thermal properties of soils and also about features of of problematic soils and their reclamation .
SSC-.702	Management of problematic soil and water	To study of area and distribution, morphological features of of problem soils and also about the reclamation of problematic soils.
<b>Semester-VIII</b>		
HORT-703	Post harvest technology of fruits, vegetables and flower crops	To aware the students about the importance, scope and causes of postharvest losses and also to study the pre and post harvest factor to affect the quality of horticultural crops. Preparation of Jam, jelly, marmalade, preserve, candy, Fermented and non-fermented beverages and also about utilization of fruit and vegetable processing waste, drying and dehydration of fruits, vegetables and flowers.
HORT-704	Propagation and nursery management	To aware the students about nursery management, principles and factors influencing seed germination of horticultural crops, propagation methods and also about types, structures, components, planning and layout of nursery and nursery certification procedure.
GPB-703	Principles of cytogenetics	To study about the architecture of chromosome in prokaryotes and eukaryotes, special types of chromosomes, role of polyploidy & aneuploids in

		crop breeding, structural & numerical variations of chromosomes and their implications.
GPB- 704	Fundamental of seed technology	To aware the students about the importance of variety development & maintenance quality, and seed production technology of self and cross-pollinated crop varieties viz. cereals & millets, pulses, oilseeds, fibres and vegetables.
AGRON-704	Dryland farming and watershed management	To provide knowledge regarding drought, tolerance and management practices, selection of suitable crops, tillage, moisture conservation techniques and water shed management practices in dryland areas.
AGRON-.703	Organic farming and soil health	To aware the students about organic farming in context to the use of bio-fertilizers, bio- pesticides, manures and vermicompost for the production of agricultural crops. Soil health – concept and Soil Health Card, harmful effect of non judicious chemical fertilization. organic produce quality considerations, certification, labelling, accreditation process and marketing.
SOIL-703	Soil and plant analysis	To understand the methods of soil and plant sampling and processing for analysis and Principles of working of pH meter, electrical conductivity meter, spectrophotometer, flame photometer and atomic absorption spectrophotometer used for soil analysis.
SOIL704	Organic farming and soil health	To aware the students about organic farming in context to the use of bio-fertilizers, bio- pesticides, manures and vermicompost for the production of agricultural crops. Soil health – concept and Soil Health Card, harmful effect of non judicious chemical fertilization. organic produce quality considerations, certification, labelling, accreditation process and marketing.

## **Programme Name : Bachelor of Commerce (B.Com)**

### **Program Educational Objectives (PEO)**

**Program Name: BACHELOR OF COMMERCE**

**Program Code: BCOM**

#### **The program aims are**

- PEO1** Inculcation of Basic Concepts of Different aspects of Commerce by associating to their known surroundings.
- PEO2** Possess wide spectrum of managerial skills alongwith competency building qualities in specific areas of business studies.
- PEO3** Exercising Professionalskills,values ,team spirit, and high leadership the Industry and Academics.
- PEO4** Excelin contemporary knowledge of business and developing inclination towards life long learning
- PEO5** Possess wide spectrum of managerial skills alongwith competency building qualities in specific areas of business studies. Alternate Solutions must be ready to solve any Problem in Practical to be faced in future course of actions.

### **Program Outcomes (PO) For Under Graduate Program**

**Program Name: BACHELOR OF COMMERCE**

**Program Code: BCOM**

After completing under graduate program in commerce, a student will be able to

- PO1** Have comprehensive knowledge of Finance, Accounting, Taxation and Business laws.
- PO2** Equip with professional, interpersonal and entrepreneurial skills.
- PO3** Gearup with updated knowledge in implementing business practices
- PO4** Prepare for postgraduate studies and to achieve success in their professional careers.
- PO5** To evaluate everything from the perspective of making a career for getting Industry ready.

### **Program Specific Outcomes (PSO)**

**Program Name: BACHELOR OF COMMERCE**

**Program Code: BCOM**

- PSO1** To cater to the manpower needs of companies in Accounting, Taxation, Business Law Auditing, Financial analysis and Management.

- PSO2** To enrich communication, ethical values, team work, professional and leadership skill set of students.
- PSO3** To inculcate entrepreneurship and managerial skills in students so as to enable them to establish and manage their business effectively
- PSO4** To integrate knowledge, skill and attitude that will sustain an environment to learning and creativity among the students with an assurance for good careers.
- PSO5** To Apply knowledge to develop how to cater day to day activities and their problems with logical and appropriate manner.

### Course outcome

Course Code	Course	Course Outcome
BC 101	Environmental and Road Safety Awareness	Creating awareness regarding Environmental and Road Safety issues
BC 102	Financial Accounting	Developing basic skills to maintain Accounts
BC 103	Business organisation and Management	To provide Basic knowledge about organization and management of business enterprises
BC 104/104 A	Punjabi / basic Punjabi	Basic knowledge of Regional Language and its use in Business Advertisement and Correspondence
BC 105	English	To develop various skills of Business Communication (Business letters, Report Writing and Basic Vocabulary)
BC 201	English	To develop various skills of Business Communication (Business letters, Report Writing and Basic Vocabulary )
BC 202	Business law	Creating awareness about various Business Laws (Mainly Indian Contract Act , Sale of Goods Act, Partnership Act and Negotiable Instruments Act)
BC 203	Business Mathematics and Statistics	Introduction with various tools used for a Statistical Analysis
BC 204 / 204 A	Punjabi / Basic Punjabi	Basic knowledge of Regional Language and its use in Business Advertisement and Correspondence
BC 301	Company Law	Making clarity of Company rules and regulations
BC 302	Income Tax law and Practice	Creating knowledge of basics of Income Tax their Heads and computation of Tax
BC 303/ 303 A	Punjabi / basic Punjabi	To give knowledge of Regional language through Text book and developing skill of Paragraph writing
BC 304	Computer Applications in	Enhancement of skills needed for Computerized Accounting System

	Business	
BC 401	Business Communication	To develop usage of Language and making English Language as a communication tool
BC 402	Corporate Accounting	Developing skills to prepare Company Accounts
BC 403	Cost Accounting	To acquaint the students with basic concepts use3d in cost Accounting, Various methods involved in cost ascertainment
BC 404	E- Commerce	To familiarize with mechanism for conducting business transactions through electronic means
BC 405/405A	Punjabi / Basic Punjabi	To give knowledge of Regional language through Text book and developing skill of Paragraph writing
BC 406	Computerized Accounting System	Enhancement of skills needed for Computerized Accounting System
BC 501 a	Human Resource Management	To Acquaint students with the techniques and principles to manage human resource of an organisation
BC 501 b	Principles of Marketing	To provide basic knowledge of Concepts, Principles, tools and Techniques of Marketing
BC 501 c	Auditing & Corporate Governance	To provide knowledge of Auditing Principles, Procedures and techniques in accordance with current legal requirements and overview of Corporate governance
BC 502 a	Fundamentals of Financial Management	To familiarize the students with principles and practices of Financial Management
BC 502 b	Indirect Tax Law	To provide practical skill related to GST, Input Tax Credit and other provisions
BC 503	Entrepreneurship	To familiarize with different Investment alternatives, framework and role of Investor protection
BC 504	Principles of Micro Economics	To culminate basic concepts / Principles of Micro economic Theory
BC 505 /505 A	Punjabi / Basic Punjabi	Basic knowledge of Punjabi and letter writing skill development
BC 601 a	Corporate Tax Planning	To provide Basic knowledge of Corporate Tax planning and its impact on decision making
BC 601 b	Money & Financial Institutions	To provide basic knowledge about role of money and Financial Institutions
BC 601 c	Management Accounting	To impart knowledge about use of Financial, Cost and other data for Managerial planning, Control and decision making
BC 601 d	E- Commerce	To familiarize with mechanism for conducting business transactions through electronic means
BC 602 a	International Business	To give knowledge of Concepts, Importance and dynamics of International Business and

		India's role and involvement in global business
BC 602 b	Office Management and Secretarial Practices	To create awareness regarding Activities in Modern Office, Facilities and Working Environment for smooth official Working
BC 602 c	Fundamentals of Investment	To familiarize with different Investment alternatives , valuation to understand role of Investor Protection.
BC 602 d	Consumer Protection	To understand Rights of Consumer, and legal framework of Protection of Consumer Rights
BC 603	Personal Selling and Salesmanship	Practical skill development to understand fundamentals of Personal Selling and Selling Process
BC 604	Indian Economy	To enable in understanding major economic problems in India and their solutions along with knowledge of modern tools of Macroeconomic analysis and policy framework
BC 605 / 605 A	Punjabi/ Basic Punjabi	Basic knowledge of Punjabi and letter writing skill development

### **Programme Name : Bachelor of Commerce (Honours) (B.Com (Hons))**

#### **Program Educational Objectives (PEO)**

**Program Name: BACHELOR OF COMMERCE (HONOURS)**

**Program Code: BCOMH**

#### **Program Educational Objectives (PEO)**

**Program Name: BACHELOR OF COMMERCE (HONOURS)**

**Program Code: BCOMH**

#### **The program aims are**

- PEO1 Inculcation of Basic Concepts of Different aspects of Commerce by associating to their known surroundings.
- PEO2 Apply the practical knowledge gained over the years in the field of auditing, tax filing, share market and other finance related services.
- PEO3 Work with the wide domain knowledge for a successful career with effective communication skills, teamwork, leadership qualities and work with value.
- PEO4 Enable to solve the issues of social relevance and to introduce them the professional ethics and practice.
- PEO5 Become the full-fledged accounting and finance professionals.

## Program Outcomes (PO) For Under Graduate Program

**Program Name: BACHELOR OF COMMERCE (HONOURS)**

**Program Code: BCOMH**

After completing under graduate program in commerce, a student will be able to

- PO1** To remain and understand the knowledge related to core discipline of professional accounting.
- PO2** To analyze the routine accounting procedures
- PO3** To apply the knowledge of accounting and technical skills in the core courses
- PO4** To promote independent learning and reflecting practice through acquisition of skills
- PO5** To encourage team work, and skills for effective collaboration to Adhoc diverse purposes
- PO6** To evaluate everything from the perspective of making a career for getting Industry ready.

### Program Specific Outcomes (PSO)

**Program Name: BACHELOR OF COMMERCE (HONOURS)**

**Program Code: BCOMH**

- PSO1** Develop Communication Skills both oral and written Communication
- PSO2** Sharpen the students' abilities to go for situational decision making
- PSO3** Aid students to acquire skills of competence that would enable them to become top class and highly talented business executives.
- PSO4** Creating ability to understand manner and different techniques to provide appropriate solutions to day to day activities of Business and different commercial enterprises.
- PSO5** Developing Managerial ability to control different types of Enterprises and handling all tasks in .

### Course outcome

Course Code	Course	Course Outcome
BCH 101	Environmental and Road Safety Awareness	Creating awareness regarding Environmental and Road Safety issues
BCH 102	Financial Accounting	Developing basic skills to maintain Accounts
BCH 103	Business law	To provide knowledge of Contract Act

		to students
BCH 104	Micro Economic	Basics of Micro level Economics , Concepts, Theories and Applications in business
BCH 105/ 105 A	Punjabi / Basic Punjabi	To develop basic skill of Regional language through Literature, grammar to use it in official correspondence
BCH 201	Business (Communication skills)	To develop effective communication skills and methods of preparing various types of Business correspondence
BCH 202	Corporate Law	To impart knowledge of Company regulations
BCH 203	Corporate Accounting	Develop the skill of Preparation of Accounts of Various Companies and getting job opportunities in corporate world
BCH 204	Macro Economics	Introducing with various issues of Macro level economics, Theories and important functions of Consumption, Investment
BCH 205/ 205 A	Punjabi / Basic Punjabi	To develop basic skill of Regional language through Literature, grammar to use it in official correspondence
BCH 3.1	Human Resource Management	Developing Knowledge of different aspects of Human Resource and its Management
BCH 3.2	Income Tax Law and Practice	Basic knowledge of Residential Status, Different Heads of Income Deductions and Computation of Tax
BCH 3.3	Management Principles and Applications	To understand basic Management Concepts and principles for better administration
BCH 3.4	Business Statistics	To make aware of statistical tools for analysis of quantitative data
BCH 3.5	E- Commerce	Understanding of Electronic usage in Business activities
BCH 4.1	Cost Accounting	To acquaint the students with basic concepts used in cost Accounting, Various methods involved in cost ascertainment
BCH 4.2	Business Mathematics	To develop practical knowledge of mathematical techniques used in Business analysis by Matrix, Interest valuation, Linear programming, Transportation and Assignment Problems techniques
BCH 4.3	Computer Applications in	Skill development in using various computer tools for Business purpose

	Business	like Word processing, Spreadsheet, Methods of presentation preparation
BCH 4.4	Indian Economy	Awareness of various issues of Indian Economy like its' sectors, stages, trends, changes, Policy implications and role in global scenario
BCH 4.5	Entrepreneurship	To make students aware about different aspects of entrepreneurship qualities, factors, starting , documentation and various issues regarding entrepreneurship development
BCH 4.6	Seminar on CSR and Business Ethics	Value inculcation in students of commerce to understand their responsibility toward society and develop Ethics in their Applications
BCH 5.1	Principles of Marketing	Understanding of various aspects of marketing and factors affecting Consumer behaviour
BCH 5.2	Fundamentals of Financial Management	Providing Concept knowledge of financial Analysis in management through various tools
BCH 5.3 (a)	Management Accounting	Imparting Knowledge of Management Accounting Tools like Financial Statement Analysis, Ratio analysis
BCH 5.3 (b)	Corporate Tax Planning	Introducing with Tax Management through various tools of Financial Management
BCH 5.3 (c)	Advertising	To provide knowledge of different aspects of Advertising
BCH 5.3 (d)	Banking And Insurance	To understand concepts working and theories of Banking and Insurance sector
BCH 5.3 (e)	Computerised Accounting System	To create ability in preparation of Computerised Accounts
BCH 5.3 (f)	Financial Markets, Institutions and Financial Services	To provide overview of Financial markets and SEBI functions and regulatory aspects
BCH 6.1	Auditing and Corporate Governance	Creating skills in Auditing and Corporate Governance
BCH 6.2	Indirect Tax Laws	Understanding of GST, Input Tax Credit Authorities, Penalties and Appeals under GST
BCH 6.3 (a)	Fundamentals of	To familiarize with different Investment

	Investment	alternatives, valuation to understand role of Investor Protection.
BCH 6.3 (b)	Consumer Affairs and Customer care	Understanding different Rights and Protection of Consumers
BCH 6.3 (c)	Business Tax Procedure and Management	Making capable in Tax computation and Tax Planning
BCH 6.3 (d)	International Business	Make acquaint with International business environment
BCH 6.3 (e)	Industrial relations and labour laws	Knowledge of Industrial regulatory framework
BCH 6.3 (f)	Business Research Methods and Project Work	To provide Research aptitude for analysis of Business activities

**Programme Name : Bachelor of Commerce  
(Accounting and Finance )  
( B.Com (A & F)**

**Program Educational Objectives (PEO)**

**Program Name: BACHELOR OF COMMERCE (ACCOUNTING & FINANCE)**

**Program Code: BAF**

The program aims are

- PEO1** Inculcation of Basic Concepts of Different aspects of Accountancy and Finance by associating to their known surroundings.
- PEO2** To demonstrate professional expertise in financial planning, analysis, control, Decision support and professional ethics with the employees
- PEO3** Successfully practice the accounting, taxation, reporting and compliance knowledge in accounting firms, KPOs and the hard core finance and account profile
- PEO4** Apply the multidisciplinary knowledge through projects and industrial training and providing a sustainable competitive edge in meeting the industry needs
- PEO5** Able to appear for Integrated Professional Competence Course (IPCC) and subsequently complete apprenticeship , so as to enable to go for final CA

## Program Outcomes (PO) For Under Graduate Program

**Program Name: BACHELOR OF COMMERCE (ACCOUNTING & FINANCE)**

**Program Code: BAF**

After completing under graduate program in commerce, a student will be able to

- PO1** Use knowledge and skills of accounting and finance in all areas of business operations
- PO2** Employ the knowledge of accounting fundamentals and accounting specialization to find solutions to complex problems in business enterprises.
- PO3** Identify, evaluate and resolve real-time business problems with the specialized knowledge developed through practical training.
- PO4** Use the comprehensive subject knowledge in solving issues related to business.
- PO5** Get prepared to become as Chartered Accountant/ Cost and Management Accountant/ Company Secretary.

## Program Specific Outcomes (PSO)

**Program Name: BACHELOR OF COMMERCE (ACCOUNTING & FINANCE)**

**Program Code: BAF**

- PSO1** Understand the concepts of basic accounting and business operations.
- PSO2** Appraise the multidimensional business situations and assess the financial health of companies.
- PSO3** Apply the knowledge of the business policies, auditing, finance etc., both at the macro and micro level
- PSO4** Analyze the economic, social and environmental issues related to business
- PSO5** Development of Ability to cope different cases to be handled in different enterprises.

### Course outcome

Course Code	Course Name	Course Outcome
BAF 101/101A	Functional Punjabi I / Punjabi Compulsory I	To make efficient in regional language to do Business correspondence in better way
BAF 102	Foundations of	To equip with skill of recording

	Accounting I	Financial Transaction
BAF 103	Fundamentals of Computer Applications	Enhancement of skills needed for Computerized Accounting System
BAF 104	Business Regulatory Framework I	Creating awareness about various Business Laws (Mainly Indian Contract Act , Sale of Goods Act, Partnership Act and Negotiable Instruments Act)
BAF 105	Micro Economics	To enhance knowledge of basic Micro Economics concepts and Theories
BAF 201	Functional English	To develop usage of Language and making English Language as a communication tool
BAF 202	Foundations of Accounting II	Creating skills to prepare Partnership Account and Computerised Accounting
BAF 203	Management Principles	Making awareness regarding Management Concepts, Functions and Techniques
BAF 204	Business Regulatory Framework II	To develop knowledge of Negotiable Instrument Act, Consumer Protection Act, RTI and Intellectual Property Rights Act
BAF 205	Macro Economics	To enhance knowledge of basic Macro Economics concepts and Theories
BAF 206/206A	Functional Punjabi II / Punjabi Compulsory II	To make efficient in regional language to do Business correspondence in better way
BAF 301	Corporate Accounting	To develop practical skills to maintain various Company Accounts
BAF 302	Income Tax Law	To enhance knowledge of Income Tax regulations
BAF 303	Financial Management	To provide analytical ability to judge Financial Decision and their outcomes
BAF 304	E- Commerce	Understanding of various E-commerce techniques, issues, systems, security and encryptions issues
BAF 305	Seminar (Based on Summer Training)	Development of practical skill to prepare various reports required by corporate sector
BAF 401	Accounting Theory	Fundamentals of Accounting, Standards, IFRS knowledge will be enhanced
BAF 402	Indirect Tax Laws	Understanding of GST, Input Tax Credit Authorities, Penalties and Appeals under GST

BAF 403	Indian Financial System	Different financial Institutions working role and importance in economy will be understood
BAF 404	Accounting for Management	Management decision making with accounting knowledge will be enhanced
BAF 405	Business Mathematics and Statistics	Tools of Derivatives, Maxima Minima, Matrices and different statistical tools will be used in analytical decision making
BAF 406	Viva – voce	Communication skill and Understanding Practical knowledge of commercial aspects will be developed
BAF 5.1	Cost Accounting	Understanding of various Costing Techniques with which cost control is possible
BAF 5.2/BAF 5.3/BAF5.4 (1)	Indirect Tax	Understanding of GST, Input Tax Credit Authorities, Penalties and Appeals under GST
(2)	Financial Management	Providing Concept knowledge of financial Analysis in management through various tools
(3)	Business Environment	To acquaint students with role of Business Environment components
(4)	Money & Financial Institutions	To equip with concepts of Money, Banks, Institutional Credit and Interest rates and their Administration
(5)	Financial Markets & Operations	To provide overview of Financial markets and SEBI functions and regulatory aspects
(6)	Project Planning & Control	Imparting understanding of Project planning ,Formulation environment along with Cost Management techniques
BAF 6.1	Cost Analysis for Decision making	To provide knowledge of Costing techniques for controlling Business activities
BAF 6.2/BAF 6.3/BAF 6.4 (1)	Corporate Tax Planning	Introducing with Tax Management through various tools of Financial Management
(2)	Security Analysis & Portfolio Management	To give knowledge of Investment and Portfolio Management with concept clearance and theoretical knowledge
(3)	Strategic Cost Accounting	Providing understanding of Costing System through various costing techniques
(4)	Contemporary Accounting	Concept clearance of IFRS, AS, Accounting Thoughts, Corporate Reporting, Price level Accounting, HRA, Social Accounting

(5)	Corporate Financial Accounting	Practical skill to prepare Accounts of Various Companies
(6)	Financial Services	Understanding of Financial Services ,Leasing, Factoring, Venture Capital and Credit rating services

## **Programme Name : Master of Commerce (M. Com)**

### **Program Educational Objectives (PEO)**

#### **Program Name: MASTER OF COMMERCE**

#### **Program Code: MCOM**

The program aims are

- PEO1 To enhance the ability understanding the Concepts of Various aspects of Commerce to get Mastery over these concepts in detail to be applied in future course of actions.
- PEO2 Integrates cognitive and analytical skills to manage financial aspects
- PEO3 Sensitizing Professional ethics and societal needs with the irholistic development
- PEO4 Make a foundation to pursue career in teaching and for advance studies
- PEO1 BecomesuccessfulentrepreneursandfinanceprofessionalsinthefieldofBanking,Insurance,ManufacturingindustriesandIT sectors.

### **Program Outcomes (PO) For Under Graduate Program**

#### **Program Name: MASTER OF COMMERCE**

#### **Program Code: MCOM**

After completing under graduate program in commerce, a student will be able to

- PO1** Apply relevant financial tools in Manufacturing and Service operations.
- PO2** Apply research technique for decision making
- PO3** Ability to use accounting software
- PO4** Acquire Technical and decision making skills (in the area of Accounting, Taxation, Portfolio analysis and and E Commerce
- PO5** Develop creativity in the area of Marketing

## Program Specific Outcomes (PSO)

**Program Name: MASTER OF COMMERCE**

**Program Code: MCOM**

- PSO1** Application of financial tools in Projects and in real time Business helps in Decision making
- PSO2** Using statistical tools in Behavioural research for business decision making
- PSO3** Adapt to recent changes in Marketing, Human Resource, Taxation, Environment and investment of securities
- PSO4** Analyse and evaluate the operation of the business related issues.
- PSO5** Analyze the economic, social and environmental issues related to business

### Course outcome

Course Code	Course Name	Course Outcome
MC101	Management Concepts & Organisational Behaviour	Obtaining knowledge of Organisation Behaviour / Culture and Conflicts resolution techniques
MC 102	Accounting for Managerial Decisions	Practical skill of maintain Company Accounts at various levels
MC 103	Business Economics	Knowledge of Economics tools like Demand, Production Price determination
MC 104	E- Commerce	Application of Computer in Business activities, Reporting and practices
MC 105(i)	Financial Management	Knowledge of Capital budgeting, cost of capital, Capital structure and Dividend Policy formation
MC 105(ii)	International Accounting	Making aware about International reporting techniques used in different countries.
MC 105(iii)	Database Management system	Practical knowledge of Data Base Management system and its application in Business recording and reporting system
MC 105 (iv)	Entrepreneurship Development and Project Management	Development of Entrepreneurship skills among youth of nation and making awareness among students to develop management skills to handle Project successfully
MC 201	Accounting for Managerial decision	Imparting Knowledge of Management Accounting Tools like Financial Statement Analysis, Ratio analysis
MC 202	Business Environment	To acquaint students with role of

		Business Environment components
MC 203	Research Methodology & Statistical Techniques	To develop Research aptitude amongst students
MC 204	Seminar based upon Current Issues to commerce	To develop current knowledge of commerce related issues
MC 205 (i)	Financial Institutes and markets	Knowledge of Different institutions working for Financial and development program in Business world
MC 205 (ii)	Micro- Finance	Basic knowledge of Micro Finance tools, challenges and Institutions
MC 205 (iii)	Corporate Governance and Business Ethics	Concept building of Corporate governance and Business ethics to be applied in practical
MC 205(iv)	International Business	Knowledge of International Business Concepts and related issues
MC 301	Strategic Cost Management	Understanding of Cost Management System , Theories, and different Costing techniques to measure and control productivity
MC 302	Stock Market Operations	Knowledge of Indian Stock markets and their functions and operations
MC 303	Corporate Tax planning	Technical skill of Tax management, Planning and knowledge of different provisions related to Taxation
MC 304	Marketing Management	Understanding of Marketing, Its different P's and Marketing Research and its importance
MC 305(i)	Management of Financial Services	SEBI its functions, Mutual funds and Regulations and guidelines to better stock market activities
MC 305(ii)	Advanced Auditing	Role of Auditing, Relevance, Requirements for Audit Planning and different types of Auditing used in checking proper Accounting procedures
MC 305(iii)	Operations Research	Developing Practical skills of Various techniques of Operation Research like LPP, PERT, CPM, Transportation. Assignment Problems and Game Theory
MC 305(iv)	International Trade and Environment	Concept and Theoretical clarity of International Trade and working of International institutions like WTO, IMF, UNCTS, ADB, SAARC, BRICS
MC 401	Human resource management	Developing Knowledge of different aspects of Human Resource and its

		Management
MC 402	Security Analysis and Portfolio management	Imparting basics and analytical view of securities and Portfolios by building strong Theoretical knowledge
MC 403	International Finance	Knowledge of Fundamentals of International finance FDI, MNC Foreign Exchange Markets
MC 404	Banking and Insurance Services	Knowledge of all aspects of Banking and Insurance sector
MC 405	Viva –Voce	To make technically strong in facing curriculum based query
MC 406 (i)	Modern Accounting Theory & Reporting Practices	Standards, Fundamentals and Reporting norms of Accounting Like IFRS will be understood
MC 406 (ii)	Financial Derivatives	Practical knowledge of Derivatives, Options, Swaps used in Financial Markets
MC 406 (iii)	Strategic management	Strategies Formulation, Functional Strategies and structure will be developed
MC 406(iv)	Production and Material management	Different methods of Inventory Management PERT and CPM techniques will be gained

### **PG Department of Economics**

#### **The Program Specific Outcomes and Course Outcomes of all the Programmes**

##### **Program Name: B A Hons. Economics**

##### **Program Educational Objectives (PEO)**

##### **Program Name: - BACHELOR OF ARTS HONOURS (ECONOMICS)**

##### **Program Code: - BAHECO**

The program aims are

**PEO 1.** To provide deep insight about various concepts of economics and areas where they are being practically used.

**PEO 2.** To enhance the knowledge of the economic variables which will help the students in their professional life.

**PEO 3.** To aware the students about various social and environmental issues which make them more responsible in the every field of life.

**PEO 4.** Making the students recognize and understand the ever changing economic environment (both national and international) and making them efficient to adapt accordingly.

**PEO 5.** Developing analytical approach among students so that they can analyze and find solution to different economic problems.

### **Program Outcomes (PO) For Under Graduate Program**

**Program Name: - BACHELOR OF ARTS HONOURS (ECONOMICS)**

**Program Code: - BAHECO**

After completing undergraduate program in Economics, a student will be able to

**PO 1.** Apply knowledge and skill in the field of Economics and statistics and will be able to have employability in these areas.

**PO 2.** Compete easily for different jobs like economic services, insurance sector, banking and other private jobs.

**PO 3.** Acquire skills in Critical Thinking, Quantitative Reasoning, Problem Solving and Communication.

**PO 4.** Able to understand various social issues and economic problems.

### **Program Specific Outcomes (PSO)**

**Program Name: - BACHELOR OF ARTS HONOURS (ECONOMICS)**

**Program Code: - BAHECO**

**PSO 1.** To provide deep insight knowledge to students so that they can understand the ever changing economic environment.

**PSO 2.** To inculcate basic and practical knowledge of different fields of economics.

**PSO 3.** To equip the students with theoretical knowledge of subject which help them to understand economics of different countries.

**PSO 4.** To develop conceptual and analytical abilities required to understand the dynamic economic problems.

**PSO 5.** The program intends to train the students and enhancing their skills so that they can become successful professionals.

**PSO 6.** To aware the students about their social responsibility so that they can become better human beings.

<b>Course Code</b>	<b>Subject</b>	<b>Outcomes</b>
BEH- 101 C1	INTRODUCTORY MICRO ECONOMICS	Enhancement in the knowledge of the student about various basic or introductory aspects of microeconomic theory.

BEH- 102 C2	INDIAN ECONOMY I	Improvement in the understanding of the student about the performance of different sectors of the Indian economy by providing an insight into the past, present and future functioning of the Indian economy.
BEH- 103 AECC-I	PUNJABI/ BASIC PUNJABI	Basic knowledge of Regional Punjabi Language.
BEH- 104 GE- I	PUBLIC FINANCE	Provides the knowledge about role and working of Government in an economy along with introducing the student to Public Finances, Public Expenditure, Public Debt as well as the Taxation.
BEH- 201 C3	INTRODUCTORY MACRO ECONOMICS	Introduces the students to formal modeling of a macro-economy in terms of analytical tools. It discusses basic macroeconomic aspects such as National Income, Employment, Consumption and Investment Functions.
BEH- 202 C4	INDIAN ECONOMY II	provides the students with the performance of different sectors of the Indian economy such as Indian Agriculture, Indian Foreign Trade, Indian Industrial Development along with the analysis of Balance of Payment.
BEH-203 AECC-II	ENVIRONMENTAL SCIENCES	Creates awareness regarding Environmental and Road Safety Issues
BEH-204 GE- II	MONEY AND BANKING	Enable students to understand the concept of Money Supply along with the study of various Financial Systems including Money and Capital Markets, Banking System and the Fiscal and Monetary Policy
BEH-301 C5	INTERMEDIATE MICRO ECONOMICS I	Provides a sound training about Consumer Theory, Theory of Demand, Production, Cost and Distribution With special reference to the Input Markets.
BEH-302 C6	INTERMEDIATE MACRO ECONOMICS I	Provides deeper insight about the Money, Rate of Interest, Inflation, Banking Structure, Trade Cycles as well as Monetary and Fiscal Policies
BEH-303 C7	STATISTICAL METHODS FOR ECONOMICS	Makes students familiar with the use of statistical tools in analyzing economic problems.
BEH-304SEC- I	TECHNICAL WRITING COMMUNICATION SKILLS	Assists the students in developing Technical Writing as well as

		Communication Skills
BEH-305GE-3	ECONOMIC HISTORY OF INDIA	Provides deeper insight about the various key aspects of Indian Economic development during the second half of British colonial rule.
BEH-401 C8	INTERMEDIATE MICRO ECONOMICS II	It emphasizes the conceptual clarity to the student about the microeconomic concepts coupled with the use of mathematical tools and reasoning by covering the detailed analysis of General Equilibrium and Welfare, Game Theory, Externalities and Public Goods.
BEH-402 C9	INTERMEDIATE MACRO ECONOMICS II	Enables the students to formal modeling of a macro-economy in terms of analytical tools. It provides detailed information about various alternative approaches to National Income accounting, Balance of Payment, Consumption Function, IS-LM Framework and the Philips Curve.
BEH-403 C10	INTRODUCTORY ECONOMETRICS	to equip the students with basic theory of econometrics and relevant applications of the econometric methods.
BEH-404SEC-2	COMPUTER FUNDAMENTALS	Provides basic knowledge of Computer Fundamentals and their use in the field of economic studies.
BEH-405 GE-4	ENVIRONMENTAL ECONOMICS	It enables the students to understand the importance of maintaining balance between economic development and environmental quality.
C 9	INTERMEDIATE MICROECONOMICS-II	It emphasizes the conceptual clarity to the student about the microeconomic concepts coupled with the use of mathematical tools and reasoning by covering the detailed analysis of General Equilibrium and Welfare, Game Theory, Externalities and Public Goods.
C 10	INTERMEDIATE MACROECONOMICS-II	Enables the students to formal modeling of a macro-economy in terms of analytical tools. It provides detailed information about various alternative approaches to National Income accounting, Balance of Payment, Consumption Function, IS-LM Framework and the Philips Curve.
C 11	MATHEMATICAL METHODS FOR ECONOMICS I	Helps students to understand the economic concepts and theories by using mathematical tools and techniques to refine the verbal logic.

DSE I	ECONOMICS OF HEALTH AND EDUCATION	This course provides a framework to analyze, among other thing, individual choice in the demand for health and education, government intervention and aspects of inequity and discrimination in both sectors.
DSE II	ENVIRONMENTAL ECONOMICS	It enables the students to understand the importance of maintaining balance between economic development and environmental quality.
C 12	MATHEMATICAL METHODS FOR ECONOMICS II	Helps students in understanding the concept and applications of Derivatives, Maxima-Minima Matrices and Linear Programming and in Economic Analysis.
C 13	INTRODUCTORY ECONOMETRICS	Provides the knowledge of basic econometrics to the students.
C 14	MONEY AND BANKING	Enable students to understand the concept of Money Supply along with the study of various Financial Systems including Money and Capital Markets, Banking System and the Fiscal and Monetary Policy
DSE III	ECONOMICS OF AGRICULTURE	To introduce to students to issues associated with Agriculture economics including system of farming and approaches to agricultural development, concepts of production, Risk and Uncertainty in Agriculture, Farm-Size and productivity relationship in Indian Agriculture, Agriculture Marketing and Pricing and Marketable Surplus.
DSE IV	ECONOMICS OF INDUSTRY	It makes students familiar with the basic concepts of industry, industrial capacity, concept of diversification, Organizational forms and theories of Firm, profit maximization modes by O. Williamson, R. Marris, Cyret and March, Location of Economic Activities and Current Problems of Industrial Sector.
DSE V	PROJECT	Provides practical knowledge to the students to analyze the economic problems thereby enabling them to enter in the field of advanced research.

## **PG Department of Economics**

### **The Program Specific Outcomes and Course Outcomes of all the Programmes**

**Program Name: MA Economics**

#### **Program Educational Objectives (PEO)**

**Program Name: - MASTER OF ARTS (ECONOMICS)**

**Program Code: - MAECO**

The program aims are

**PEO 1.** To enhance the conceptual knowledge of the students and provide deep insight about the key indicators of economics.

**PEO 2.** To teach the latest developments in the principles of economic theory and applications of theories in analyzing current economic problems.

**PEO 3.** Students can acquire the knowledge which can be used to help promote a better society.

**PEO 4.** To help the students to know about the functioning of production sector viz. agriculture, industry and services and their effect on household sector.

**PEO 5.** To equip the students with knowledge to make them more logical and realistic.

#### **Program Outcomes (PO) Post Graduate Program (PG)**

**Program Name: - MASTER OF ARTS (ECONOMICS)**

**Program Code: - MAECO**

After completing Post graduate program in Economics, a student will be

**PO 1.** Able to develop a realistic view which makes them competitive globally.

**PO 2.** Enhancing his/her overall knowledge and will be able to fetch jobs both in public and private domain.

**PO 3.** Able to equip more knowledge about business environment and to start their own venture and help them self-employment.

**PO 4.** Able to have good knowledge of Economics which open up research opportunities in the national level premier Educational Institutes.

**PO 5.** Able to nurture rational thinking.

#### **Program Specific Outcomes (PSO)**

**Program Name: - MASTER OF ARTS (ECONOMICS)**

**Program Code: - MAECO**

**PSO 1.** To equip students with a set of tools, which would help them to solve real world problems.

**PSO 2.** To prepare students to be full-time academicians, with specialized knowledge in international economics and finance.

**PSO 3.** The program also prepares the academically oriented student to excel in PhD studies.

**PSO 4.** To enhance the skills of students and making them a better decision maker.

**PSO 5.** To sensitize the students regarding social issues so that they can contribute for the betterment of the society.

<b>Course code</b>	<b>Subject</b>	<b>Outcomes</b>
ECO-101	MICRO ECONOMIC ANALYSIS-I	To introduce the students to the basic Microeconomics concepts like deductive and inductive methods of analysis, static and dynamic equilibrium, demand, recent development in demand analysis, Theory of Production and Cost and forms of markets. To enable the students to apply the theories in analyzing real world Micro issues.
ECO-102	MACRO ECONOMIC ANALYSIS-I	: It provides the knowledge to the students for the basic models of macroeconomics are introduced to analyse the economic fluctuations. The functioning of the economy as a whole is analyzed from the point of view of competing schools of Macroeconomic thoughts. To introduce the students to the basic Macroeconomics concepts like National income and Theories of full employment, Theories of Consumption and Investment, Money, Interest and Income and Theories of Inflation.
ECO-103	BASIC QUANTITATIVE METHODS-I	It makes students familiar with the use of statistical tools in analyzing Economics problems and provides deeper insight about the Matrices, concept of determinant, concepts of Geometric mean, Correlation and Regression.
ECO-104-A (i)	ECONOMICS OF AGRICULTURE	To introduce to students to issues associated with Agriculture economics including system of farming and approaches to agricultural development, concepts of production, Risk and Uncertainty in Agriculture, Farm-Size and productivity relationship in Indian

		Agriculture, Agriculture Marketing and Pricing and Marketable Surplus.
ECO-104-A (ii)	COMPUTER APPLICATIONS FOR ECONOMISTS-I	By learning the subject students are able to solve their research problems by using the economics tools in various computer software. They will become good analyst of their research.
ECO-104-A (iii)	ECONOMICS OF POPULATION	By learning the course it will enhance knowledge to explain demographic changes in the world and their major determinants. The students can evaluate the use of demographic concepts and population theories to understand contemporary socio-economic issues and current affairs. It also assesses the relationship between demographic change and policy.
ECO-105-B (i)	MATHEMATICAL ECONOMICS- I	students become able to measure the effect of change and discover techniques to improve their decision making process. They can make economic dynamics and solve problems through adjustment with time and a new dimension of scientific, logical and critical thinking, that will assist their mind to solve personal, professional and social problems and guide them to take decisions.
ECO-105-B (ii)	ECONOMICS OF GROWTH AND DEVELOPMENT-I	It provides the framework to understand the society or an economy's Growth, Development and Under-development, Economic Development and Institutions, Resources for Development, Theory of Growth.
ECO-104-B (iii)	ECONOMICS OF INFRASTRUCTURE	On completion of this course student should understand key issues and problems with respect to regulation, governance and policies for infrastructure sector. They will be able to apply key principles, concepts and tools relevant to the economic regulations of infrastructure industries.
ECO- 201	MICRO ECONOMIC ANALYSIS-II	To introduce the students to the basic Microeconomics concepts like demand, elasticity, utility and recent developments in the theory of demand. To enable the students to apply the theories in analysing real world Micro issues. To introduce the

		students to the Microeconomics concepts like Price and Output Determination, Alternative Theories of the Firm, Distribution and Welfare Economics.
ECO-202	MACRO ECONOMIC ANALYSIS-II	It provides the knowledge to the students for the basic models of macro economics are introduced to analyse the economic fluctuations. The functioning of the economy as a whole is analyzed from the point of view of competing schools of Macroeconomic thoughts. To introduce the students to the Macroeconomics concepts like Micro-foundation of macro-economics, macro-economic policy for stabilization and growth, open economy macro-economic and inflation and monetary policy.
ECO-203	BASIC QUANTITATIVE METHODS-II	It makes students familiar with the use of statistical tools in analyzing Economics problems and provides deeper insight about the Calculus, Applications of Derivatives in economics, Interpolation, Arithmetic and Geometric Progression, Linear Programming, Index Numbers and Time series Analysis.
ECO-204-A (i)	ECONOMICS OF INDUSTRY	It makes students familiar with the basic concepts of industry, industrial capacity, concept of diversification, Organizational forms and theories of Firm, profit maximization modes by O. Williamson, R. Marris, Cyret and March, Location of Economic Activities and Current Problems of Industrial Sector.
ECO-204-A (ii)	COMPUTER APPLICATIONS FOR ECONOMISTS-II	By learning the subject students are able to solve their research problems by using the economics tools in various computer software. They will become good analyst of their research.
ECO-204-A (iii)	ECONOMICS OF ENVIRONMENT	It enables the students to understand the importance of maintaining balance between economic development and environmental quality.
ECO-205-B (i)	MATHEMATICAL ECONOMICS-II	students become able to measure the effect of change and discover techniques to improve their decision making process. They can make economic dynamics and solve problems through adjustment with

		time and a new dimension of scientific, logical and critical thinking, that will assist their mind to solve personal, professional and social problems and guide their to take decisions.
ECO-205-B (ii)	ECONOMICS OF GROWTH AND DEVELOPMENT-II	It provides the framework to understand the society or Endogenous models of growth by Lucas and Romer, theory of convergence and divergence, Development and migration, resource allocation, human capital, Growth, poverty and inequality and Environment and Development
ECO-205-B (iii)	ECONOMIC ADMINISTRATION WITH SPECIAL REFERENCE TO INDIA	At the completion of the course the students will be able to Analyze the basic concepts in economic administration, process of new economic policy and also Understand how planning takes place at the national, state and local levels along with the various institutions involved in the process of planning. They can describe the factors of public undertakings, Industrial policy resolutions and the impact of new economic policy.
ECO-301	EVOLUTION AND STRUCTURE OF INDIAN ECONOMY-I	Improvement in the understanding of the student about the performance of different sectors of the Indian economy by providing an insight into the past, present and future functioning of the Indian economy
ECO-302	PUBLIC ECONOMICS-I	Students are provided with the understanding of the functions of government, including taxation, public expenditure, regulation and social service delivery, and touches upon economic, social, political and administrative aspects of government's involved in economy.
ECO-303	INTERNATIONAL ECONOMICS-I	Provides a deep understanding about the broad principles and theories, which tend to govern the free flow of trade in goods, services and capital – both short-term and long-term – at the global level.
ECO-304-A(i)	THEORY OF STATISTICS-I	Trains the students in the use of statistical tools in analyzing economic problems by simple statistical tools and techniques.
ECO-304-A (ii)	PUNJAB ECONOMY	Provides the highlights of the situation and economic conditions of the state Punjab.

ECO-304-A (iii)	COMPARATIVE ECONOMIC SYSTEM-I	enhances the knowledge domain of students by providing a deep understanding about the broad principles and theories relating to different economic systems, working strategies as well as operational difference among the economies under same economic system.
ECO-305-B (i)	ECONOMETRICS-I	Provides the knowledge of basic econometrics to the students.
ECO-305-B (ii)	MATHEMATICAL ECONOMICS-I	Improves the understanding of the students by providing them with a practical approach towards Consumer behaviour, production analysis and market equilibrium.
ECO-305-B (iii)	MONEY AND BANKING	Enhances the knowledge of students for the operations of money and banking and their interaction with the rest of the economy by using the concepts of terms and evolution of money, banking reforms and international banking.
ECO-401	EVOLUTION AND STRUCTURE OF INDIAN ECONOMY-II	Makes the students of Economics understand the prevailing condition about infrastructure, capital formation and role of foreign capital in context to Indian Economy
ECO-402	PUBLIC ECONOMICS-II	Enhances the skills to know the fiscal institutions-tax systems, expenditure programmes, budgetary procedures, stabilization instruments,
ECO-403	INTERNATIONAL ECONOMICS-II	Intends to provide a deep understanding about the broad principles and theories, balance of payments, international exchanges, and international capital movement.
ECO-404-A (i)	THEORY OF STATISTICS-II	Provides detailed knowledge about the use of statistical tools for estimation and analysis in the field of Research.
ECO-404-A (ii)	POLITICAL ECONOMY OF DEVELOPMENT	Enhances the knowledge of the students in the socio-political domain by highlighting the social formation and transition of economic and political structures especially in the case of Third World.
ECO-404-A (iii)	COMPARATIVE ECONOMICS SYSTEM-II	Equips the student with the knowledge of market mechanism and planning, economic problems, class division along with convergence of capitalism and

		socialism.
ECO-405-B (i)	ECONOMETRICS-II	Expands the knowledge of students with the detailed analysis of econometric techniques such as distributed lagged models, simultaneous equation models, linear probability models and techniques of penal data analysis.
ECO-405-B (ii)	MATHEMATICAL ECONOMICS-II	Advances the knowledge of students with applicability of linear programming and input output analysis in different economic domains along with explanation to the Game Theory.
ECO-405-B (iii)	RESEARCH METHODOLOGY	Enhances the Research skills of the students by providing the thorough and step by step detail about research methods, sampling techniques and data analysis in solving various socio-economic problems.

### **Program Educational Objective (PEO)**

**Program Name: BACHELOR OF VOCATION (FOOD PROCESSING)**

**Program Code: BVFP**

#### **The Program aims are**

**PEO1.** The students will have in-depth knowledge about various food processing concepts

**PEO2.** To inculcate innovative ideas and project management skills in order to make them capable to grow as an entrepreneur

**PEO3.** To create competent graduates who shall pursue careers in the field of food processing, quality control, product development and techno-marketing

**PEO4.** To organize graduates who will apply the technical knowledge and know-how to solve the problems related to food processing and preservation for the benefit of the society

**PEO5.** To understand food composition and its physicochemical, nutritional, microbiological and sensory aspects

**PEO6.** To develop the ability to communicate proficiently and work in a multidisciplinary team and competitive environment

**PEO7.** To build up the knowledge of current issues and capability to engage in life-long learning process and enable the students in totality to start-up their own business organizations or work as leaders in food industries

**PEO8.** To develop conceptual knowledge and skill set required as per national occupational standards (NOS) of food processing sector

**Program Outcome (PO) Bachelor of Vocation Program (B.VOC)**

**Program Name: BACHELOR OF VOCATION (FOOD PROCESSING)**

**Program Code: BVFP**

After completing undergraduate program in food processing, a student will be able to

**PO 1:** Enhance capability to formulate healthy foods with much emphasis on functional food concept and understand various processing methods involved in food sector

**PO 2:** To learn about various testing methods as well as preservation technologies and get full fledged knowledge about cleaning and sanitation in food plant sector

**PO 3:** Can differentiate between different packaging materials and their usage in packaging of numerous food products also get knowledge about rules and regulations with respect to coding and labeling which is beneficial while perusing job in food industry

**PO 4:** To understand quality control and assurance system in food industry and understand risk assessments procedure for food sector

**PO 5:** To prepares the students for specific job role in various sectors in food processing industries and Professional organization

**Program Specific Outcomes (PSO)**

**Program Name: BACHELOR OF VOCATION (FOOD PROCESSING)**

**Program Code: BVFP**

**PSO 1:** Apply knowledge of general education subjects and skill development subjects to the conceptualization of food processing technologies

**PSO 2:** Conduct and undertake investigations of problems of including design of processing technology for various type food, food analysis, food quality and safety aspects and interpretation of data in order to provide valid conclusions

**PSO 3:** Designing and formulation of new food products on the basis of consumers demands, development of technologies of food processing, design that meet solutions needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations

**PSO 4:** Demonstrate understanding of the social, health, safety, legal and cultural issues and the consequent responsibilities relevant to Food processing

**PSO 5:** Create, select and apply appropriate processing technology/techniques, resources, modern processing tools in order to improve the quality, safety and the shelf life fresh and process food

**PSO 6:** Understand and commit to professional ethics and responsibilities and norms/regulation for manufacturing of process food and its effects on health

**Course Outcomes:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcomes</b>
BVFP-112	Introductory Food Microbiology	<ol style="list-style-type: none"> <li>1. Students at this stage are able to learn handling of microflora and identification of food pathogens</li> <li>2. They also familiar with various inoculation and media preparation techniques</li> <li>3. This course enrich students to grab job opportunities as microbiologist in food industries</li> </ol>
BVFP-113	Introductory Food Biochemistry	<ol style="list-style-type: none"> <li>1. Present course values in-depth knowledge for nutritional values of food molecules in human diet.</li> <li>2. Enhance capability to formulate healthy foods with much emphasis on functional food concept</li> </ol>
BVFP-114	Fruits and Vegetables Processing	<ol style="list-style-type: none"> <li>1. The students will be able to understand various processing methods involved in fruits and vegetable preservation</li> <li>2. Student itself can prepare different beverages as well as vegetable products at household level</li> </ol>
BVFP-115	Basics of Dairy Processing	<ol style="list-style-type: none"> <li>1. Students learn about various testing methods as well as preservation technologies of milk</li> <li>2. Get full fledge knowledge about cleaning and sanitation in dairy plant</li> <li>3. Learn about different milk products preparation technologies, furthermore can be used for household preparation</li> </ol>
BVFP-211	English	<ol style="list-style-type: none"> <li>1. Students will be able to interpret texts with attention to ambiguity, complexity and aesthetic value</li> <li>2. Students will practice a deliberate writing process with emphasis on inquiry, audience, research, and revision.</li> <li>3. Students will be able to identify topics and formulate questions, identify appropriate methods and sources for research and engage ethically with sources.</li> <li>4. Students will participate in critical conversations and prepare, organize and deliver their work to the public.</li> </ol>
BVFP-212	Holistic	

	Development I: Personality Development and Ethics Education	
BVFP-213	Fundamentals of Food Packaging	<ol style="list-style-type: none"> <li>1. Students can differentiate between different packaging materials and their usage in packaging of numerous food products</li> <li>2. Get knowledge about rules and regulations with respect to coding and labeling which is beneficial while perusing job in food industry</li> </ol>
BVFP-214	Basics of Food Processing	<ol style="list-style-type: none"> <li>1. Completion of this course recognize the effect of processing conditions on food product quality</li> <li>2. Also help to grasp recent developments in food processing and formulations</li> <li>3. Appraise critically the advantages and limitations of various food processing techniques</li> </ol>
BVFP-215	Introduction to Food and Nutrition	<ol style="list-style-type: none"> <li>1. This course reveals in depth understanding of all the basic food constituents for healthy survival</li> <li>2. Emphasize on to development of healthy food with above listed constituents as per ICMR</li> </ol>
BVFP-311	Environment Science and Road Safety Awareness	<ol style="list-style-type: none"> <li>1. Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.</li> <li>2. The students will be able to understand the ethical, cross-cultural and historical context of environmental issues and the links between human and natural systems.</li> <li>3. Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.</li> <li>4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.</li> </ol>
BVFP-312	Introduction to Cereal and Legume Processing	<ol style="list-style-type: none"> <li>1. The students will be able to understand basic composition &amp; structure of food grain</li> <li>2. Understand the basics of milling operations</li> <li>3. Students learn processing of food grains into value added products</li> <li>4. Manage production, distribution &amp; storage of grains</li> <li>5. Manage by products utilization</li> </ol>

		6. Student will be able to understand technology for Oil Extraction & Oil Seed Processing along with equipments
BVFP-313	Record Keeping in Food Processing	<ol style="list-style-type: none"> <li>1. The students will be able to understand the importance of documentation</li> <li>2. Understand information needs to be documented and the guidelines for documentation</li> </ol>
BVFP-314	Bakery and Snack Products Technology	<ol style="list-style-type: none"> <li>1. Acquire knowledge of technologies behind bakery products</li> <li>2. Understand trends in bakery industry</li> <li>3. Get an overview of modified bakery products for different health conditions</li> <li>4. Students shall be able to understand basics of preparing extruded Snack Foods Items along with working of equipments related to extrusion of Food Products</li> <li>5. Students shall be able to understand preparation of Breakfast Snacks in particular cereal based Snacks Food Items</li> </ol>
BVFP-315	Savory and Beverage Technology	<ol style="list-style-type: none"> <li>1. The students will be able to understand the science and technology for processing different types of beverages.</li> <li>2. Understand processing of fruit juice beverages, carbonated beverages, citrus beverages, tea and coffee.</li> <li>3. Understanding of permitted additives in beverages.</li> <li>4. Ability to understand the impact of processing on quality of beverage.</li> </ol>
BVFP-411	Communication Skills I	<ol style="list-style-type: none"> <li>1. students will be able to understand and apply knowledge of human communication and language processes as they occur across various contexts</li> <li>2. Students will be able to understand and evaluate key theoretical approaches used in the interdisciplinary field of communication and explain major theoretical frameworks, constructs, concepts for the study of communication and language</li> <li>3. Understand the research methods associated with the study of human communication, and apply at least one of those approaches to the analysis and evaluation of human communication.</li> </ol>
BVFP-412	Introduction to Food Safety	<ol style="list-style-type: none"> <li>1. The students will be able to understand the concept of food safety, types of hazards and their control measures</li> <li>2. Identify and prevent potential sources of food</li> </ol>

		contamination 3. Comprehend the need of hygiene and sanitation for ensuring food safety
BVFP-413	Quality Control and Regulations	1. Students will be able to understand quality control and assurance system in food industry. 2. Understand risk assessments procedure for food sector. 3. GMPs and GHP regulations in the food sector. 4. Understand and critically evaluate the presence of contaminants in food quality assurance. 5. Understand chemical, technological and toxicological aspects of food additives in food preservation. 6. The students will be able to understand about food laws and standards, quality parameters and sensory evaluation of food.
BVFP-414	Fundamentals of Computers	1. Understanding the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming 2. The students will be able to write, compile and debug programs in C language and use different data types for writing the programs. 3. Acquire knowledge about design programs connecting decision structures, loops and functions. 4. Understand the dynamic behavior of memory by the use of pointers. 5. The students will be able to understand use different data structures and create / manipulate basic data files and developing applications for real world problems.
BVFP-415	Egg, Meat and Fish Technology	1. Students will be able to understand the need and importance of livestock, egg and poultry industry 2. Understand the structure, composition and nutritional quality of animal products. 3. Understand the concept and methods of processing, preservation and quality control of Meat, Egg & Fish in Food Industry 4. Understand the technology of preparation of various animal food products and byproduct utilization 5. Understand factors affecting egg quality and measures of egg quality 6. Student will be having broad knowledge of status & scope of Meat, Egg & Poultry industry world wide.
BVFP-511	Technology of Milk	1. The students will be able to understand process related to storage, processing and distribution

	Milk Products	<p>of milk and milk Products.</p> <ol style="list-style-type: none"> <li>Perceive the different properties of milk and milk products.</li> <li>Grasp the technology of fat rich dairy products.</li> <li>Comprehend the technology of condensed milk, dried milk, cheese, yoghurt and indigenous products will be understood.</li> <li>Acquire knowledge regarding hygiene and sanitation practices in the milk and milk products industry.</li> </ol>
BVFP-512	Marketing and Retail Management	<ol style="list-style-type: none"> <li>The students will be able to understand the areas of accountability for retail management.</li> <li>Understand the role of manager impacts the success of a retail business.</li> <li>Understand level of interest in pursuing a career in retail management.</li> <li>Acquire knowledge about design, implementation and assessment of retailing strategies based on consumer needs and market changes.</li> <li>The students will be able to understand process of conceiving, producing, and selling fashion products for in-store and on-line retailing.</li> </ol>
BVFP-513	Sugar and Confectionary Technology	<ol style="list-style-type: none"> <li>The students will be able to understand the status of confectionary industry in India.</li> <li>Attain knowledge of the standards &amp; regulations, quality parameters for sugar, chocolates and other confectionery products.</li> <li>Understand the technologies (equipment and process) for confectionary product preparations.</li> </ol>
BVFP-514	Food Industry Waste Management	<ol style="list-style-type: none"> <li>Understand the process of production of gelatin from waste and utilization of egg shell</li> <li>The students will be able to understand the process of different type of germ oil and protein extraction</li> <li>Acquire knowledge about preparation different type of whey beverages, toffee or pinni from ghee residue and butter milk product.</li> <li>Understand the use of agriculture waste and food processing product from their waste</li> </ol>
BVFP-515	Entrepreneurship Development in Food Processing	<ol style="list-style-type: none"> <li>Develop an insight of Entrepreneurs and Entrepreneurship development.</li> <li>The students will be able to understand the basics of Business project report and SWOT analysis.</li> <li>Develop insight for different types of Fund raising.</li> <li>Understand the different support system for business development.</li> </ol>

		<p>5. Gain knowledge and acquired skills for setting up an enterprise and its management.</p> <p>6. The students would have been acquainted with designing and planning of food plant layout and operations research.</p>
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<b>Subject Code &amp; Name</b>	<b>Lab Name</b>	<b>Learning Outcomes</b>
<b>B.VFP-117</b>	<b>. Basics of Food Processing</b>	<ul style="list-style-type: none"> <li>✚ To develop proficiency skill in food processing operations.</li> <li>✚ Student will able to understand different drying operations.</li> <li>✚ Hands on experience on to the freezing, heating, drying, hurdles technological operations.</li> </ul>
<b>B.VFP-115</b>	<b>Introductory Food Microbiology</b>	<ul style="list-style-type: none"> <li>✚ Students will develop practical skills in handling of glassware, preparation of slants, swabs, plates using nutrient agar and culture and sub-culturing of microbes.</li> <li>✚ Students will able to understand all microbiological aspects of food with deep understanding.</li> </ul>
<b>BVFP-116</b>	<b>Introductory Food Chemistry</b>	<ul style="list-style-type: none"> <li>✚ Students will develop practical skills in determination of qualitative and quantitative methods for food materials.</li> <li>✚ Achieve the nutritional values maintenance principles of food molecules in human diet through nutraceutical and functional food development.</li> </ul>

<b>BVFP-115</b>	<b>Basics of Dairy Processing</b>	<ul style="list-style-type: none"> <li>+ Lab practices, here confident the students about the technology of preparation for various milk products.</li> <li>+ It also help the students to keep expertise on to the commercial adoption of milk and products to be on self entrepreneur side.</li> </ul>
<b>B.VFP-216</b>	<b>Fundamentals of Food Packaging</b>	<ul style="list-style-type: none"> <li>+ The students shall acquire knowledge of package identification, suitability, application and quality evaluation of packaging materials.</li> <li>+ Students get familiarize regarding identification of differently graded plastics and other food grade packaging materials.</li> <li>+ Casting of edible packaging material is itself novel and unique approach here learned to students.</li> </ul>
<b>B.VFP-217</b>	<b>Fruits and Vegetable Processing</b>	<ul style="list-style-type: none"> <li>+ Students will able to learn different processing operations such as blanching, canning and</li> <li>+ preservation techniques such as drying.</li> <li>+ Understand processing of different products (fruits and vegetables and their juices).</li> <li>+ The students shall be able to assess the quality of fruit and vegetables and shall be able to develop various fruit and vegetable products.</li> </ul>
<b>B.VFP-218</b>	<b>Introduction to Food and Nutrition</b>	<ul style="list-style-type: none"> <li>+ Students will able to learn</li> </ul>

		<p>BMI/BMR values for healthy life style and understanding for the preparation of diet chart for different age groups according to RDA.</p> <p>✚ Proficiency in determining % crude protein value in supplement diet by Lowry/ Microkjeldahl method.</p>
<b>B.VFP-316</b>	<b>Introduction to Cereal and Legume Processing</b>	<p>✚ Student shall be well versed with processing techniques of cereals and estimation of their quality parameters.</p> <p>✚ Students shall be able to learn practical knowledge of % fraction of different graded milled products such as wheat and rice also the nutritional variations exist in them.</p>
<b>B.VFP-317</b>	<b>Record Keeping in Food Industries</b>	<p>✚ Students shall be aware about available chemicals, glasswares, plasticwares and utensils in food lab.</p> <p>✚ Students shall be proficient to use of statistical tools such as spread sheets and MS Word.</p> <p>✚ They will be proficient in preparing SOP's for available instruments of food technology lab.</p>
<b>B.VFP-318</b>	<b>Bakery and Snacks Technology</b>	<p>✚ Students shall be able to understand basics of preparing extruded Snack Foods Items along with working of equipment related to extrusion of Food Products</p>

		<ul style="list-style-type: none"> <li>Students acquire the hands on experience for the preparation of breakfast snacks.</li> </ul>
<b>B.VFP-319</b>	<b>Beverage Technology</b>	<ul style="list-style-type: none"> <li>Students will able to learn different extraction and clarification methods in juice preparation.</li> <li>Students will proficient in preparing different beverage drinks that are fruit based or dairy based composite products.</li> <li>Students will able to optimize the process for wine preparation and malt preparation in case of beer production.</li> </ul>
<b>B.VFP-416</b>	<b>Introduction to Food Safety</b>	<ul style="list-style-type: none"> <li>Completion of this lab course, learners achieve the proficiency in dealing with food processing equipment and food processing area with implementation of the concept of HACCP and GMP Principles.</li> <li>Grasp key concept about quality assessments and safety of foods through Comprehend food quality management system.</li> </ul>
<b>B.VFP-417</b>	<b>Nutraceutical and Functional Foods</b>	<ul style="list-style-type: none"> <li>Students will acquire knowledge of new product development with nutraceutical and functional attributes.</li> <li>Proficiency in designing and development of functional food for</li> </ul>

		<p>diabetic and obese population.</p> <ul style="list-style-type: none"> <li>Also adapt them to have healthy and wise eating habits.</li> </ul>
<b>B.VFP-419</b>	<b>Egg, Meat and Fish Technology</b>	<ul style="list-style-type: none"> <li>Students will able to understand the concept of grading, processing and preservation of egg and its products.</li> <li>Proficiency in evaluating sensory attributes and microbiological aspects of egg (fresh and stale) and processed meat.</li> <li>Understand the technology of preparation of various animal food products (ready to cook poultry) and their by-product utilization.</li> </ul>
<b>B.VFP-517</b>	<b>Sugar and Confectionary Technology</b>	<ul style="list-style-type: none"> <li>Students will able to understand all quality parameters during processing and preservation of chocolate, candy, jelly and juices.</li> <li>Make them perfect in technology for the preparation of different stages of sugar confections.</li> </ul>
<b>B.VFP-518</b>	<b>Food Industry Waste and Effluents</b>	<ul style="list-style-type: none"> <li>Put all the learners to practically sound conditions in term of measuring all qualitative, quantitative and microbial test of water (fresh and waste water).</li> </ul>

**Program Name: M.Sc Food Technology**  
**Program Educational Objective (PEO)**

## **Program Name: MASTER OF FOOD TECHNOLOGY**

### **Program Code: MSFT**

**PEO 1:** To inculcate in-depth knowledge of Food Technology with an ability to analyze, evaluate, design, discriminate, interpret, create and integrate existing and new knowledge

**PEO 2:** To create awareness about importance of food safety, food quality, food plant sanitation, food laws and regulations, food engineering and packaging in food industry

**PEO 3:** To equip the students with state of art knowledge in Food Engineering and Technology to prepare the students as leaders in industry, academia and research organizations and demonstrate a capacity for self-management, teamwork and decision-making with rational approach in order to achieve the targeted goals

**PEO 4:** To inculcate technical writing and communicating ability for effective documentation and presentations and develop strong research aptitude through research work to enable the students to opt for higher levels of learning in the field of Food Technology

**PEO 5:** To acquaint and equip students with professional and intellectual integrity, ethics of research and scholarship, impact of research outcomes on professional practices and responsibilities to contribute positively in the sustainable development of society.

**PEO 6:** To enable the students to get engaged in lifelong learning independently with the vigor and zeal and become capable to start-up their own businesses

## **Program Outcome (PO) For Postgraduate Program (PG)**

### **Program Name: MASTER OF FOOD TECHNOLOGY**

### **Program Code: MSFT**

After completing Post graduate program in management studies, a student will be

**PO 1:** To understand fundamentals of principles of food processing, food chemistry and nutritional changes during processing and preservation, nutraceuticals, food additives, also students will be able to understand and apply sensory evaluation of food

**PO 2:** Able to work in modern tools and equipments to analyze food composition, identify microorganism responsible for food spoilage.

**PO 3:** Able to understand the principles behind analytical techniques used in evaluating the biochemical properties of food and to identify the microorganism responsible for food spoilage and the methods to control the food spoilage

**PO 4:** Demonstrate knowledge in various engineering properties of food and its application in food industry, concept of mass balance and energy balance, unit operations in food processing, conventional and advanced methods of food preservation, methods of packing, post-harvest practices so as to develop food products and develop device for food industry

**PO 5:** To develop specific skill based on their interest in bakery and confectionery, meat, poultry and fish processing, food fermentation, dairy processing.

**PO 6:** Able to apply the principles of Hazard Analysis and Critical Control Points (HACCP) to ensure safe food processing, Students will also have knowledge in regulations governing the manufacture and sales of the food products

### **Program Specific Outcomes (PSO)**

**Program Name: MASTER OF FOOD TECHNOLOGY**

**Program Code: MSFT**

**PSO 1:** To impart knowledge of Food-Biochemistry, Food Chemistry and Food Microbiology

**PSO 2:** To impart knowledge and understanding of technology of vegetables, fruits, plantation crops, meat, poultry, dairy and sea foods, bakery and confectionery

**PSO 3:** To impart abilities to design technologies for food processing and food preservation

**PSO 4:** To impart abilities to design and develop food packaging and distribution

**PSO 5:** To trained students on use of various instrumentations for the evaluation of food quality and safety

**PSO 6:** To trained students to conduct scientific experiments and document scientific investigations

**PSO 7:** To educate on professional ethics, economics, social sciences, inter personal and communication skills relevant to professional practice

**PSO 8:** To provide general perspective on lifelong learning and opportunities for a career in industry, scientific organization, education, business and commerce

#### **Course Outcomes:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcomes</b>
MSFT-101	Food Biochemistry and Nutrition	1. Present course values in-depth knowledge for nutritional values of food molecules in human diet. 2. Enhance capability to formulate healthy foods with much emphasis on functional food concept
MSFT-102	General Microbiology	4. Students at this stage are able to learn handling of microflora and identification of food pathogens 5. They also familiar with various inoculation and media preparation techniques 6. This course enrich students to grab job

		opportunities as microbiologist in food industries
MSFT-103	Principles of Food Processing	<ol style="list-style-type: none"> <li>1. Awareness about different food processing aspect, application in preservation of food by way of these unit operations</li> <li>2. Can do job in various food processing industries as the concept of preservation is studied</li> </ol>
MSFT-104	Food Additives	<ol style="list-style-type: none"> <li>1. Gain awareness about different type of additives to increase the shelf life of food product</li> <li>2. Theoretical knowledge of preservation aspect as per FSSAI labeling to develop food and feed</li> <li>3. Develop application capacity for home scale flavored drinks and foods</li> </ol>
MSFT-105	Research Methodology	<ol style="list-style-type: none"> <li>1. Understand the concept of probability, estimation and hypothesis testing so as to choose the appropriate analytical tool</li> <li>2. Gain knowledge to identify business problem</li> <li>3. Develop skill of making appropriate Research Design</li> <li>4. Develop skill to make an excellent research report</li> </ol>
MSFT-201	Fruits and Vegetables Technology	<ol style="list-style-type: none"> <li>3. The students will be able to understand various processing methods involved in fruits and vegetable preservation</li> <li>4. Student itself can prepare different beverages as well as vegetable products at household level</li> <li>5. Understand maturity indices of fruits and vegetables.</li> <li>6. Understand the concept of quality in relation to fruit and vegetable based products.</li> </ol>
MSFT-202	Food and Industrial Microbiology	<ol style="list-style-type: none"> <li>1. Understand important genera of microorganisms associated with food and their characteristics, their growth pattern and parameters.</li> <li>2. Comprehend the role of the microorganisms in spoilage of foods and methods of their control</li> <li>3. Acquire knowledge about the beneficial role of microorganisms and different types of fermented foods</li> <li>4. Understand the laboratory techniques to detect, quantify and identify microorganisms in foods</li> </ol>
MSFT-203	Milk and Milk Processing Technology	<ol style="list-style-type: none"> <li>1. To learn about the preservation cum processing techniques for milk with enhanced shelf life</li> <li>2. Developing skills about technological preparations of milk products at home scale aimed to shelf extension</li> <li>3. This course also help to formulate lists of value</li> </ol>

		added composite dairy foods
MSFT-204 (a)	Sugar and Confectionery Technology	<ol style="list-style-type: none"> <li>4. The students will be able to understand the status of confectionary industry in India.</li> <li>5. Attain knowledge of the standards &amp; regulations, quality parameters for sugar, chocolates and other confectionery products.</li> <li>6. Understand the technologies (equipment and process) for confectionary product preparations.</li> </ol>
MSFT-204 (b)	Fermentation Technology-I	<ol style="list-style-type: none"> <li>1. develop learning credentials for production of biomass and operational technique for fermentor</li> <li>2. Hands on efficiency in operational methods for development of various alcoholic drinks</li> <li>3. Development of food and feed synthesized by means of microbial resources</li> </ol>
MSFT-205 (a)	Enzymes in Food Industry	<ol style="list-style-type: none"> <li>1. The students will be able to understand applications of enzyme in food and feed industry</li> <li>2. The students will be able to co-relate enzymes used in various branches of food and feed industry</li> <li>3. Understand mechanism of action of enzymes used in specific processes</li> <li>4. Choose appropriate process condition ( temperature, pH, time) depending on the type of enzyme in the process</li> </ol>
MSFT-205 (b)	Fermentation Technology-II	<ol style="list-style-type: none"> <li>1. Understand basic components of Food Fermentation Technology and their principles.</li> <li>2. Understand concept of different fermentation process.</li> <li>3. Develop different types of starters used in Food Industry.</li> <li>4. Apply acquired skills in production of various fermented food.</li> </ol>
MSFT-301	Egg, Meat & Fish Technology	<ol style="list-style-type: none"> <li>7. Students will be able to understand the need and importance of livestock, egg and poultry industry</li> <li>8. Understand the structure, composition and nutritional quality of animal products.</li> <li>9. Understand the concept and methods of processing, preservation and quality control of Meat, Egg &amp; Fish in Food Industry</li> <li>10. Understand the technology of preparation of various animal food products and byproduct utilization</li> <li>11. Understand factors affecting egg quality and measures of egg quality</li> </ol>
MSFT-302	Food Engineering	<ol style="list-style-type: none"> <li>1. Understand the principles of Unit operation</li> <li>2. Students will be able to understand basics of</li> </ol>

		<p>designing of food plant and storage system</p> <ol style="list-style-type: none"> <li>Students can be familiarized with basic principles of refrigeration, freezing, fluid flow, heat and mass transfer, steam, psychrometrics etc. from food industrial point</li> <li>Students can apply these principles for solving numerical and problems</li> </ol>
MSFT-303	Biostatistics	<ol style="list-style-type: none"> <li>The student will be able to create graphs using Stata to communicate important information data and interpret these graphs</li> <li>Understand concept of random, representative sample from a population</li> <li>Understand logic behind statistical confidence intervals and hypothesis tests</li> <li>Compute estimated power or sample size for a proposed study comparing two or more groups with or without stratification adjustment</li> <li>Compute and interpret measures of association for continuous and categorical data</li> </ol>
MSFT-304 (a)	Milk Product Technology-I	<ol style="list-style-type: none"> <li>The students will be able to understand process related to storage, processing and distribution of milk and milk Products.</li> <li>Grasp the technology of fat rich dairy products.</li> <li>Comprehend the technology of condensed milk, dried milk, cheese, yoghurt and indigenous products will be understood.</li> <li>Acquire knowledge regarding hygiene and sanitation practices in the milk and milk products industry</li> </ol>
MSFT-304 (b)	Pseudocereals and Millet Technology	<ol style="list-style-type: none"> <li>The students will be able to understand basic composition &amp; structure of pseudocereals and millets</li> <li>Understand composition and nutrition health benefit of amaranth, quinoa, chia and sorgham</li> <li>Manage production, distribution &amp; storage of grains</li> <li>Manage by products utilization</li> </ol>
MSFT-305 (a)	Food Plant Layout	<ol style="list-style-type: none"> <li>Acquire knowledge of design of food plant and food processing equipments</li> <li>Develop a basic knowledge of principles of safe and hygienic storage and transportation of fresh plant and animal foods.</li> <li>Understand principles of cold chain management and design of cold stores and warehouses</li> <li>Gain knowledge of solid and liquid waste management and treatment</li> <li>Acquire knowledge of hygiene and sanitation principles and practices in food industry.</li> <li>Understand method of determination of BOD</li> </ol>

		and COD.
MSFT-305 (b)	Bakery Technology	<ol style="list-style-type: none"> <li>6. Acquire knowledge of technologies behind bakery products</li> <li>7. Understand trends in bakery industry</li> <li>8. Get an overview of modified bakery products for different health conditions</li> <li>9. Students shall be able to understand basics of preparing extruded Snack Foods Items along with working of equipments related to extrusion of Food Products</li> <li>10. Students shall be able to understand preparation of Breakfast Snacks in particular cereal based Snacks Food Items</li> </ol>
MSFT-401	Cereals, Pulses and Legume Technology	<ol style="list-style-type: none"> <li>11. The students will be able to understand basic composition &amp; structure of food grain</li> <li>12. Understand the basics of milling operations</li> <li>13. Students learn processing of food grains into value added products</li> <li>14. Manage production, distribution &amp; storage of grains</li> <li>15. Manage by products utilization</li> <li>16. Student will be able to understand technology for Oil Extraction &amp; Oil Seed Processing along with equipments</li> </ol>
MSFT-402	Food Packaging	<ol style="list-style-type: none"> <li>3. Students can differentiate between different packaging materials and their usage in packaging of numerous food products</li> <li>4. Get knowledge about rules and regulations with respect to coding and labeling which is beneficial while perusing job in food industry</li> </ol>
MSFT-403	Food Quality and Regulations	<ol style="list-style-type: none"> <li>1. After course completion, students will be able to get various areas of Food Safety &amp; Quality Assurance.</li> <li>2. Grasp key concept about quality assessments of foods through Comprehend food quality management system</li> <li>3. Apprehend the Indian and International food laws</li> </ol>
MSFT-404 (a)	Nutraceutical & Functional Foods	<ol style="list-style-type: none"> <li>1. Acquire knowledge on various bioactive compounds showing health benefits</li> <li>2. Understand various physiological and biochemical aspects of chronic diseases and its remedies by food</li> <li>3. Application of studied concept for new products development with nutraceutical potential</li> </ol>
MSFT-404 (b)	Food Product Development	<ol style="list-style-type: none"> <li>1. Students will have hands on practice and experience of literature survey, idea filtration, prototype product preparation, analysis, packaging and shelf-life study and finally</li> </ol>

		<p>costing.</p> <p>2. This course help students to further take this idea for commercialization &amp; become entrepreneurs</p>
MSFT-405 (a)	Milk Product Technology-II	<p>1. The students will be able to understand process related to storage, processing and distribution of milk and milk Products.</p> <p>2. Perceive the different properties of milk and milk products.</p> <p>3. Grasp the technology of fat rich dairy products.</p> <p>4. Comprehend the technology of condensed milk, dried milk, cheese, yoghurt and indigenous products will be understood.</p> <p>5. Acquire knowledge regarding hygiene and sanitation practices in the milk and milk products industry</p>
MSFT-405 (b)	Beverage Technology	<p>5. The students will be able to understand the science and technology for processing different types of beverages.</p> <p>6. Understand processing of fruit juice beverages, carbonated beverages, citrus beverages, tea and coffee.</p> <p>7. Understanding of permitted additives in beverages.</p> <p>8. Ability to understand the impact of processing on quality of beverage</p>

Subject Code & Name	Lab objectives	Learning Outcomes
MFT-106	<b>Food biochemistry and Nutrition Lab</b>	<p>At the end of the course, the students are expected to have;</p> <ul style="list-style-type: none"> <li>✚ Capable in handling and characterization of various food and feed.</li> <li>✚ Hands on experience with various physico-chemical techniques needed in investigation of the nutrition cum metabolism maintenance of human body.</li> </ul>
MFT-107	<b>General Microbiology Lab</b>	<ul style="list-style-type: none"> <li>✚ Students are well on side in terms of media preparation, microscopy, microflora handling and staining procedures.</li> <li>✚ Understand the structural similarities and differences among various physiological groups of bacteria.</li> </ul>
MFT-108	<b>Principles of Food Processing Lab</b>	<ul style="list-style-type: none"> <li>✚ At the end of these practical course students knows the handling of unit operations of food processing.</li> <li>✚ To compute the moisture content and drying characteristics of food materials.</li> <li>✚ To describe and demonstrate the milling equipments.</li> </ul>
MFT-109	<b>Food Additives Lab</b>	<ul style="list-style-type: none"> <li>✚ To know about the importance of additives in maintaining or improving food quality.</li> <li>✚ Learners are capable to differentiate food additive usage in formulations with that of sensory variations.</li> </ul>
MFT-206	<b>Fruits and Vegetable Technology</b>	<ul style="list-style-type: none"> <li>✚ Ability to establish the quality specifications for the</li> </ul>

	<b>Lab</b>	<p>processing of fruit and vegetables.</p> <ul style="list-style-type: none"> <li>✚ Students are capable to develop various fruit and vegetable products with quality assurance and safety.</li> <li>✚ Understand principles and methods of preservation of fruits and vegetables.</li> </ul>
<b>MFT-207</b>	<b>Food and Industrial Microbiology Lab</b>	<ul style="list-style-type: none"> <li>✚ Students are able to deal with handling of microflora and their associated advantages in the form of fermented dairy</li> <li>✚ Emphasized on to the commercial viability of the products, based on geographic attributes</li> </ul>
<b>MFT-208</b>	<b>Milk &amp; Milk processing Technology Lab</b>	<p>Student shall acquire knowledge about ;</p> <ul style="list-style-type: none"> <li>✚ How to do sampling of milk and milk products.</li> <li>✚ Physical, Chemical &amp; Microbial analysis of milk and milk products. 3. Development of different milk products.</li> <li>✚ Characterization of milk products, Quality control of milk &amp; milk products.</li> </ul>
<b>MFT-209a</b>	<b>Sugar and Confectionary Technology Lab</b>	<ul style="list-style-type: none"> <li>✚ Students will able to understand all quality parameters during processing and preservation of chocolate, candy, jelly and juices.</li> <li>✚ Practices on to the lab equipments with varied ingredients and additives, help them to grasp practical learning with the hope to optimize new products.</li> </ul>
<b>MFT-209b</b>	<b>Fermentation Technology-I Lab</b>	<ul style="list-style-type: none"> <li>✚ Hands on expertise for fermentor operation</li> <li>✚ Well versed with various up-</li> </ul>

		streaming and down-streaming processing
<b>MFT-210a</b>	<b>Enzymes in Food Industry Lab</b>	<p>✚ Handling, safe usage and storage of enzyme is the main aim here to put them on maximally active side in terms of enzyme derived foods.</p> <p>✚ Germination, malting, bakery application is the novel concern which make students involve in the ongoing trends of texturized and nutrient rich segments.</p>
<b>MFT-210b</b>	<b>Fermentation Technology-II Lab</b>	<p>✚ To develop dilution and other microbiological handling adaptability through this course.</p> <p>✚ Working procedure on to the fermented, cell line development is another achievement.</p>
<b>MFT-306</b>	<b>Egg, Meat &amp; Fish Technology Lab</b>	<p>✚ Students will able to understand the concept of grading, processing and preservation of egg and its products.</p> <p>✚ Proficiency in evaluating sensory attributes and microbiological aspects of egg (fresh and stale) and processed meat.</p> <p>✚ To understand the technology of preparation of various animal food products (ready to cook poultry) and their by-product utilization.</p>
<b>MFT-307</b>	<b>Food Engineering Lab</b>	<p>✚ Hands on demonstration for lab mounted equipments and processes help students to learn them keenly for better practical adaptability.</p> <p>✚ Fluid flow, TDT curve and</p>

		<p>psychrometric principles of drying and dehydration practice have commercial adaptability to have long shelf stable fruits and vegetable products.</p>
<b>MFT-406</b>	<b>Cereal, Pulses &amp; Legume Technology Lab</b>	<p>✚ Student shall be well versed with processing techniques of cereals and estimation of their quality parameters.</p> <p>✚ Students shall able to learn practical knowledge of % fraction of different graded milled products such as wheat and rice also the nutritional variations exist in them.</p> <p>✚</p>
<b>MFT-407</b>	<b>Food Packaging Lab</b>	<p>✚ Students shall acquire knowledge of package identification, suitability, application and quality evaluation of packaging materials.</p> <p>✚ Students get familiarize regarding identification of differently graded plastics and other food grade packaging materials.</p> <p>✚ Students cope-up with and understand the concept of compatibility aspect of product-package to have long stability of packed produce.</p>
<b>MFT-408a</b>	<b>Nutraceuticals &amp; Functional Foods Lab</b>	<p>✚ Students will acquire knowledge of new product development with nutraceutical and functional attributes.</p> <p>✚ Proficiency in designing and development of functional food for diabetic and obese population.</p> <p>✚ Also adapt them to have</p>

		healthy and wise eating habits.
<b>MFT-408b</b>	<b>Food Product Development Lab</b>	<p>✚ Various novel, traditional and overseas formulations with fortification, enrichment &amp; supplementation practices is the motive that students proficient with.</p> <p>✚ Various composite, value added production and by-product utilization is another aspect that they achieved with.</p>

### Program Educational Objectives (PEO)

#### **Program Name: - BACHELOR OF SCIENCE (B.Sc. Non-medical)**

Program Code:- BSNM

The program aims are

**PEO 1.** Inculcating in-depth knowledge about various basic scientific concepts and functional areas of science in context of industry and research world.

**PEO 2.** Developing necessary experimentation, interpersonal, Team work and leadership skills so as to be able to take up various responsibilities in science field.

**PEO 3.** Creating awareness about various social and ethical issues which will enable students to become ethical and responsible towards their Organization, Society and Nation.

**PEO 4.** Making the students recognize and understand the upcoming new technologies and inventions and develop aptitude and ability to adapt to this ever changing technical environment.

**PEO 5.** Developing skills among students so that scientific thinking and observation capability can be developed.

## Program Outcomes (PO) For Under Graduate Program Program

Name: - BACHELOR OF SCIENCE (B.Sc. Non-medical)

Program Code:- BSNM

After completing undergraduate program in sciences, a student will be able to

- PO 1.** Develop an in-depth knowledge and understanding through the core courses which form the basis of Physics.
- PO 2.** To apply conceptual knowledge and skills learnt into practical world and in real life situations.
- PO 3.** Gain theoretical insight into scientific concepts theories and models
- PO 4.** Demonstrate scientific and professional work style
- PO 5.** Enhance their Creative thinking and problem-solving capabilities
- PO 6.** Develop a foundation for pursuing higher education in the field of Science.
- PO 7.** Use experimental apparatus as a tool for scientific investigations/understanding

## Program Specific Outcomes (PSO)

**Program Name: - BACHELOR OF SCIENCE (B.Sc. Non-medical)**

Program Code:- BSNM

- PSO 1.** Understanding the basic concepts of physics particularly concepts in mechanics, quantum mechanics, statistical mechanics and electricity and magnetism to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws through logical and mathematical reasoning.
- PSO 2.** Learn to carry out experiments in basic as well as certain advanced areas of physics such as nuclear physics, condensed matter physics, and electronics.
- PSO 3.** To equip the students with theoretical knowledge along with the necessary practical skills for scientific world.
- PSO 4.** To develop conceptual and analytical abilities required for effective decision making in ever changing technical environment.
- PSO 5.** The program intends to train the students to become competent enough for entry level

science professionals the world.

**PSO 6.** Gain hands-on experience to work in applied fields.

**PSO 7.** Understand the basic concepts of certain sub fields such as nuclear, wave optics, solid state physics, and Special theory of relativity etc.

**PSO 8.** Gain a through grounding in the subject to be able to teach it at school levels.

**PSO 9.** Viewing physics as a training ground for the mind developing and critical attitude.

**PSO 10.** Facility of logical reasoning that can be applied to diverse fields.

## **Program Educational Objectives (PEO)**

**Program Name: - BACHELOR OF SCIENCE (MEDICAL)**

**Program Code: BSM**

The program aims are

**PEO 1.** To understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.

**PEO 2.** To demonstrate, solve and an understanding of major concepts in all disciplines of life sciences

**PEO 3** To develop scientific temper and thus can prove to be more beneficial for the society as the scientific developments can make a nation or society to grow at a rapid pace.

**PEO 4.** To create an awareness of the impact of chemistry/botany/zoology on the environment, society, and development outside the scientific community

**PO-5.** To employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.

**PEO 6.** To recognize and understand the ever changing global environment and develop aptitude and ability to adapt to this ever changing environment.

## **Program Outcomes (PO)**

**Program Name: - BACHELOR OF SCIENCE (MEDICAL)**

**Program Code: BSM**

After completing this program, students will be able to :

**PO 1.** Acquire the knowledge with facts and figures related to various subjects in pure sciences such as Chemistry, Botany, Zoology, etc.

**PO 2.** Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments. The skills of observations and drawing logical inferences from the scientific experiments.

**PO 3.** Develop various communication skills such as reading, listening, speaking, etc., which will help in expressing ideas and views clearly and effectively.

**PO 4.** Analyze the given scientific data critically and systematically and the ability to draw the objective conclusions.

**PO 5.** Realize that knowledge of subjects in other faculties, such as humanities, performing arts, social sciences etc. can have greatly and effectively influence which inspires in evolving new scientific theories and inventions.

**PO 6.** Realize that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude and other necessary qualities leads towards a successful life.

## **Program Specific Outcomes (PSO)**

**Program Name: - BACHELOR OF SCIENCE (MEDICAL)**

**Program Code: BSM**

PSO-1. Students acquire fundamental knowledge in Chemistry, Botany and Zoology through theory and practical's.

PSO-2. They can opt for higher studies in Botany, Zoology, Chemistry, Biotechnology and Fisheries

PSO-3. Helped to understand role of major concept in biological sciences.

PSO-4. Students will be able to recognize the relationship between structure and function at all levels: molecular, cellular, and organism.

PSO-5 To create awareness about cultivation, conservation and sustainable utilization of biodiversity (flora & fauna).

PSO-6. To know advance techniques in plant sciences like tissue culture, Phytoremediation, plant disease management, formulation of new herbal drugs, etc.

PSO-7 Students able to start nursery, mushroom cultivation, biofertilizer production, fruit preservation and horticultural practices.

**PSO-8.** Comprehending fundamental concepts in modern biology to meet the emerging trends Handling microbial and biochemical systems← Procuring hands on real time experience in industries.←

**Department of Chemistry**

**Program Name: Bachelor of Science (B.Sc.)**

**Course Outcomes:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
<b>BSM/BSNM (C)-102</b>	Atomic Structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons	<ol style="list-style-type: none"><li>1. The students will be able to understand the interactions between matter and energy at both the atomic and molecular level.</li><li>2. The students will acquire the knowledge to predict atomic structure, chemical bonding and molecular geometry based on accepted models.</li><li>3. The students will be able to understand the fundamental concepts of organic chemistry and acquire the knowledge to distinguish between geometrical and optical isomerism and the stereochemistry of various organic moieties.</li><li>4. The course will enable the students to understand various methods of preparation and properties of aliphatic &amp; aromatic hydrocarbons.</li></ol>
<b>BSM/BSNM (C)-112</b>	Chemistry Lab: Atomic Structure, Bonding, General Organic Chemistry & Aliphatic Hydrocarbons	<ol style="list-style-type: none"><li>1. The students will be able to understand how to find the strength and concentration of salt in the given solution by volumetric analysis.</li><li>2. The students will acquire the practical knowledge to detect various elements present in given organic compounds.</li><li>3. The students will acquire the practical knowledge of separating various components present in a mixture by using chromatographic technique.</li></ol>
<b>BSM/BSNM (C)-202</b>	Chemical Energetics, Equilibria & Functional group Organic Chemistry-I	<ol style="list-style-type: none"><li>1. The students will be able to understand the various name reaction with the mechanisms with special reference to rearrangement reactions, oxidation and reductions.</li><li>2. The students will acquire the</li></ol>

		<p>knowledge of thermodynamic aspects of chemical equilibrium and laws of thermodynamics.</p> <p>3. The students will be able to understand the concept of strength of acids and bases.</p>
<b>BSM/BSNM (C)-212</b>	Chemistry Lab: Chemical Energetics, Equilibria & Functional Group Organic Chemistry-I	<p>1. The students shall be able to understand the concept of finding out the enthalpies of various acids and salts.</p> <p>2. The students will learn to find out the adulteration of different drinks.</p> <p>3. The students shall acquire the practical knowledge of reaction mechanism and synthesis of compounds of industrial importance.</p> <p>4. The students will be able to get the practical knowledge of purification and recrystallisation methods.</p>
<b>BSM/BSNM (C)-302</b>	Solutions, Phase Equilibrium, Conductance, Electrochemistry & Functional Group Organic Chemistry-II	<p>1. The students will be able to understand different types of binary solutions such as miscible, partially miscible and immiscible solutions along with their applications.</p> <p>2. The students will be able to learn thermodynamic aspects of equilibrium between different phases and phase diagrams of one component and two component systems.</p> <p>3. The students will be able to understand structure elucidation of biomolecules.</p> <p>4. The students will be able to understand different types of electrolytic and galvanic cells, and measurement of conductance along with its applications.</p> <p>5. The students will be able to learn methods of preparation and properties of amines, carboxylic acid and their derivatives.</p>
<b>BSM/BSNM (C)-312</b>	Solutions, Phase Equilibrium, Conductance, Electrochemistry & Functional Organic Chemistry-II Chemistry Lab	<p>1. The students shall be able to understand the various concepts of physical and chemical equilibrium.</p>

		<p>2. The students will acquire the practical knowledge to construct phase diagrams and to determine CST of two component system.</p> <p>3. The students shall be able to get knowledge of qualitative organic analysis of organic compounds possessing mono functional groups.</p> <p>4. The students will be able to learn the importance of paper chromatography in chemistry.</p>
<b>BSM/BSNM (C)-321</b>	Green Methods In Chemistry	<p>1. The students will be able to learn the twelve principles of green chemistry and toxicity, hazard and risks of chemical substances.</p> <p>2. The students shall be able to learn the design of safer chemicals and products.</p> <p>3. The students will learn to carry out solvent free reactions in aqueous medium.</p>
<b>BSM/BSNM (C)-402</b>	Transition Metal & Coordination Chemistry, States Of Matter & Chemical Kinetics	<p>1. The students will be able to understand chemistry of d and f block elements, Latimer diagrams, VBT and CFT for bonding in coordination compounds, concept of CFSE and Jahn-Teller distortion.</p> <p>2. The students will acquire the knowledge of Maxwell-Boltzmann distribution, critical constants and viscosity of gases, properties of ideal and real gases and deviation from ideal behaviour.</p> <p>3. The students will able to learn about properties of liquids such as surface tension and viscosity, symmetry elements, crystal structures of NaCl, KCl and CsCl.</p> <p>4. The students will gain the knowledge of rate of reactions and the factors affecting it.</p>
<b>BSM/BSNM (C)-412</b>	Transition Metal & Coordination Chemistry, States of Matter & Chemical Kinetics Chemistry Lab	<p>1. The students shall be able to carry out qualitative analysis of mixtures containing two acidic and two basic radicals in presence of interfering radical by semi-</p>

		<p>micro methods.</p> <p>2. The students will understand how to determine viscosity, surface tension and to carry out gravimetric and complexometric titrations.</p> <p>4. The course will enable them to determine kinetics of various reactions.</p>
<b>BSM/BSNM (C)-421</b>	Basic Analytical Chemistry	<p>1. The students will be able to understand the various concepts of analytical chemistry such as accuracy, sampling, error and precision in measurements.</p> <p>2. The students will acquire knowledge of analysis of soil and water by pH measurements and complexometric titrations.</p> <p>3. The students will be able to estimate macro nutrients like potassium, calcium, magnesium ions in soil samples by flame photometry.</p> <p>4. They will be able to determine caffeine and iron by spectrophotometric methods.</p>
<b>BSM/BSNM (C) 502(i)</b>	Spectroscopy and Polymer Chemistry	<p>1. The students will get a deep insight into the various spectroscopic methods used for the characterization of organic compounds.</p> <p>2. The course will enable the students to understand the principle, instrumentation of various spectroscopic techniques like UV-Vis, IR and NMR spectroscopy.</p> <p>3. The students will be able to apply the concepts of spectroscopic techniques to distinguish between and / or identify simple organic compounds.</p> <p>4. The students will be able to understand mass spectrometry, its Instrumentation, various methods of ionization, Different detectors, Rules of</p>

		<p>fragmentations of different functional groups.</p> <p>5. The students will be familiarised with different types of polymerisation techniques, methods of preparation and uses of various organic and inorganic polymers.</p> <p>6. The students will get an idea of the acidity of enolates, alkylation of diethyl malonate and ethyl acetoacetate and concept of Keto-enol tautomerism operating in these enolates.</p>
<p><b>BSM/BSNM (C) 502(ii)</b></p>	<p>Transition Metal Complexes and Bio-Inorganic Chemistry</p>	<p>1. The students will be able to understand basic concepts, preparation, bonding and applications of various organometallic compounds.</p> <p>2. The students will learn about metal olefin complexes, their bonding and applications in homogeneous and heterogeneous catalysis.</p> <p>3. The course will enable the students to learn the properties, structures and bonding in metal carbonyls.</p> <p>4. The students will be familiarized with the concepts of oxidation and reduction and different categories of acids and bases.</p> <p>5. The students will be able to learn the concepts of thermodynamic and kinetic stability of complexes, the Trans effect, Theories of Trans effect and its mechanism.</p> <p>6. The students will be able to understand the importance of metal ions in biological systems, structure and functioning of Metalloporphyrins with special reference to Hemoglobin and Myoglobin, Sodium/Potassium</p>

		<p>pump, toxicity caused by the metal ions and chelation therapy.</p>
<b>BSM/BSNM (C)-502(iii)</b>	<b>Chemistry of Inorganic Materials</b>	<ol style="list-style-type: none"> <li>1. The students will be able to understand different methods for the preparation of Inorganic Solids and chemistry of Molecular Materials.</li> <li>2. They will be familiarised with nanostructures and nanomaterials, Preparation of gold and silver metal nanoparticles, Carbon nanotubes and inorganic nanowires.</li> <li>3. The students will be introduced to Engineering Materials for Mechanical Construction, their Composition, mechanical and fabricating characteristics and applications.</li> <li>4. The students will be getting an insight into the role of matrix in composites, classification, different categories of composites, environmental effects and applications of composites.</li> </ol>
<b>BSM/BSNM (C)-502(i) (P)</b>	<b>Spectroscopy and Polymer Chemistry Practical</b>	<ol style="list-style-type: none"> <li>1. The course will enable the students to prepare derivatives of different functional groups and then the characterization of these derivatives with the help of UV-Vis and IR spectroscopy.</li> <li>2. The students will be able to prepare some polymeric compounds with the help of Free radical polymerization method and some condensation polymers too.</li> <li>3. They will be able to determine the average molecular weight of the given polymer by viscosity method.</li> </ol>
<b>BSM/BSNM (C)-502(ii) (P)</b>	<b>Transition Metal Complexes and Bio-Inorganic Chemistry Practical</b>	<ol style="list-style-type: none"> <li>1. The students will be able to synthesize coordination compounds.</li> </ol>

		<p>2. They will learn to determine stoichiometry of Metal-Ligand complexes by Job's method.</p> <p>3. They will be able to separate mixture of metal ions using paper chromatography.</p>
<b>BSM/BSNM (C)-502(iii) (P)</b>	<b>Chemistry of Inorganic Materials Practical</b>	<p>1. The course will enable the students to synthesize nanoparticles of Au, Ag and ZnO using different synthetic strategies.</p> <p>2. They will be able to synthesize hydrogels by precipitation techniques.</p>
<b>BSM/BSNM (C)-602(i)(C):</b>	<b>Heterocyclic Compounds and Physical Aspects of Spectroscopy</b>	<p>1. The students will be familiarized with molecular orbital picture, aromaticity, methods of preparation, physical and chemical properties of 5 member, 6 member and fused ring heterocyclic compounds.</p> <p>2. The student would be able to achieve knowledge about the interactions of electromagnetic radiation and matter and their applications in spectroscopy</p> <p>3. The students will learn laws of photochemistry, concepts of Quantum yield, Luminescence, Photosensitization and Jablonski Diagrams.</p> <p>4. The students will be able to understand principle, instrumentation, selection rules involved in different transitions, spectra involved in Rotational, Vibrational and Electronic spectroscopy.</p> <p>5. The students will be able to apply the different spectroscopic techniques in the study of structure elucidation of atoms and molecules.</p>
<b>BSM/BSNM (C)-602(ii)</b>	<b>Quantum Mechanics And Transition Metal Complexes</b>	<p>1. This course will enable the students to learn the basic</p>

		<p>postulates of quantum mechanics and to solve the simple quantum mechanical models such as simple harmonic oscillator, particle in 1D, 3D - box.</p> <p>2. The students will be able to understand and apply symmetry elements and carry out symmetry operations in simple molecules.</p> <p>3. Students will be able to understand the application of valence bond theory (VBT) and molecular orbital theory (MOT) to H<sub>2</sub> like molecules, quantum mechanical principle of hybridization and calculation of wave functions of hybrid orbitals.</p> <p>4. The students will be familiarised with Electronic spectra of Transition metal complexes and Jahn Teller Effect.</p> <p>5. Students will learn about the magnetic properties of Transition Metal Complexes, L-S coupling, temperature independent paramagnetism and orbital contribution to magnetic moment.</p>
<p><b>BSM/BSNM (C)-602(iii)</b></p>	<p><b>Analytical Methods in Chemistry</b></p>	<p>1. The course will enable the students to understand the fundamental laws and selection rules of spectroscopy including UV-Visible, Infrared and atomic absorption spectroscopy.</p> <p>2. The students will learn the experimental skills on thermal and electro-analytical methods for different applications, principle of instrumentation and techniques for quantitative estimation and determination of equivalence points.</p> <p>3. The students will understand qualitative and quantitative aspects of chromatographic methods of analysis: IC, GLC, GPC, TLC and HPLC.</p> <p>4. The students will learn about mechanism of extraction,</p>

		technique of extraction and qualitative and quantitative aspects of solvent extraction.
<b>BSM/BSNM (C)-602(i) (P)</b>	<b>Heterocyclic Compounds and Physical Aspects of Spectroscopy</b>	<ol style="list-style-type: none"> <li>1. The students will be able to prepare heterocyclic organic compounds and polymers via multi step synthetic sequences.</li> <li>2. The students will study UV-Vis spectra of coloured solutions for determining their <math>\lambda_{\max}</math> values.</li> <li>3. The students will be able to carry out complexometric and colorimetric studies.</li> </ol>
<b>BSM/BSNM (C)-602(ii) (P)</b>	<b>Quantum Mechanics And Transition Metal Complexes</b>	<ol style="list-style-type: none"> <li>1. The students will learn to determine the strength of solutions colorimetrically and hence verify Beer –Lamberts Law</li> <li>2. They will be able to determine CST and CSC for phenol/water system.</li> <li>3. The course will enable the students to determine refractive index of liquids by using Abbe’s refractometer.</li> <li>4. They will be able to find out the end points of titrations of mixtures of strong acids and weak acids conductometrically.</li> <li>5. They will learn to determine distribution coefficients of iodine between <math>\text{CCl}_4</math> and <math>\text{H}_2\text{O}</math></li> </ol>
<b>BSM/BSNM (C) 602(iii)(P)Lab</b>	<b>Analytical Methods in Chemistry Practical</b>	<ol style="list-style-type: none"> <li>1. The students will be able to develop an understanding of the role of the chemist in measurement and problem solving in chemical analysis.</li> <li>2. The students will have work experience of handling spectro-photometric analysis.</li> </ol>

		3. The course will provide an understanding of and skills in advanced methods of separation and analysis.
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**Course Outcomes:**

**B.Sc. (N. M.)- I (PHYSICS)**  
**SEMESTER I**

<b>S. No.</b>	<b>Course code</b>	<b>Course</b>	<b>Course outcome</b>
<b>1.</b>	<b>BCC(P)-101</b>	<b>Mechanics</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand relative motion, inertial and non-inertial frames, Newton's Law of motion and conservation principles, the analogy between translational and rotational kinematics. universal law of gravitation, gravitational potential energy and explain central forces</li> <li>• Develop a qualitative understanding of rotational inertia</li> <li>• Explain how two body problem can be reduced to a one body problem.</li> <li>• Describe the behaviour of a damped and driven harmonic oscillator in both time and frequency domains.</li> <li>• Derive Lorentz transformation equations by using special theory of relativity.</li> </ul>
<b>2</b>	<b>BCC(P)-101(P)</b>	<b>Mechanics Lab</b>	<p>On completion of this lab course, student have experience of experimentation with topics related to:</p> <ul style="list-style-type: none"> <li>• Relative motion, inertial and non-inertial frames, Newton's Law of motion and conservation principles, the analogy between translational and rotational kinematics. gravitational potential energy and explain central forces</li> <li>• Develop a qualitative understanding of rotational inertia</li> <li>• two body problem reduction to a one body problem.</li> <li>• The behaviour of a damped and driven harmonic oscillator in both time and frequency domains.</li> <li>• Poisson's ratio</li> </ul>

**B.Sc. (N. M.)- I (PHYSICS)**  
**SEMESTER II**

S. No.	Course code	Course	Course outcome
1.	BCC(P)-201	<b>Electricity, magnetism and EMT</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand electric and magnetic fields in matter.</li> <li>• Apply Maxwell's equations to various physical problems.</li> <li>• Calculate EM wave propagation.</li> <li>• Understand the use of Coulomb's law and Gauss's law for the electrostatic force.</li> <li>• Use the Lorentz force Law for the magnetic force.</li> <li>• Use of Faraday's Law in induction problems.</li> <li>• Understand the basic laws that underlie the properties of electric circuit elements.</li> </ul>
2	BCC(P) 201(P)	<b>Electricity and Magnetism Lab</b>	<p>On completion of this lab course, student have experience of experimentation with topics related to:</p> <ul style="list-style-type: none"> <li>• Electric and magnetic fields in matter.</li> <li>• Variation of magnetic field with Solenoid</li> <li>• Coulomb's law and Gauss's law for the electrostatic force.</li> <li>• Use of Faraday's Law in induction problems.</li> <li>• Logarithmic decremenent</li> <li>• the basic laws that underlie the properties of electric circuit elements</li> </ul>

**B.Sc. (N. M.)-II(PHYSICS)**  
**SEMESTER-III**

S. No.	Course code	Course	Course outcome
1.	BCC(P)-301	<b>Statistical Mechanics and Optics</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Identify and describe the statistical nature of concepts and laws in thermodynamics.</li> <li>• Use the statistical physics methods such as Maxwell Boltzmann, Fermi-Dirac and Bose-Einstein distribution.</li> <li>• Apply the concepts and principles of Black-Body radiation to analyze radiation phenomenon.</li> <li>• Use the principles of wave motion and superposition to explain the physics of polarization, interference and diffraction.</li> </ul>

			<ul style="list-style-type: none"> <li>Describe the operation of optical devices including polarizers and interferometers.</li> </ul>
2	<b>BCC(P)-301(P)</b>	<b>Statistical Mechanics and Optics (Physics LAB)</b>	<p>On completion of this lab course, student have experience of experimentation with topics related to:</p> <ul style="list-style-type: none"> <li>Identify and describe the statistical nature of concepts and laws in thermodynamics.</li> <li>Use the statistical physics methods such as probability</li> <li>Newton rings</li> <li>Use the principles of wave motion and superposition to explain the physics of interference and diffraction.</li> <li>Optical devices including polarizers and interferometers.</li> </ul>
3	<b>BSEC(P)-304</b>	<b>Skill Enhancement Course-I: Physics Workshop Skills</b>	<p>On completion of this course, student will be familiar with</p> <ul style="list-style-type: none"> <li>Meter scale, Vernier caliper, Screw gauge, manufacturing methods like cutting, welding, soldering and the lever mechanism.</li> </ul>
4	<b>BSEC(P)-304.2</b>	<b>Computational Physics Skills</b>	<p>On completion of this course, student will be familiar with Computational Physics Skills, FORTRAN Programming</p>
5	<b>BSEC(P)-304.3</b>	<b>Electrical circuits and Network Skills</b>	<p>On completion of this course, student will be familiar with Electrical circuits and Network Skills, electronic components</p>
6	<b>BSEC(P)-504</b>	<b>Basic Instrumentation Skills</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>Explain types of errors, specifications and significance of multimeter and voltmeter.</li> <li>Describe types of millivoltmeters and their significance, features of CRO and CRT.</li> <li>Understand the working of impedance bridges and digital instruments.</li> </ul>
7	<b>BSEC(P)-304.5</b>	<b>Renewable Energy and Energy harvesting</b>	<p>On completion of this course, student will be familiar with Renewable Energy and Energy harvesting, solar cells</p>

8	BSEC(P)-304.6	Technical Drawing	On completion of this course, student will be familiar with Technical Drawing for physics and other technical courses.
9	BSEC(P)-604	Radiation Safety	On completion of this course, student will be able to <ul style="list-style-type: none"> <li>Understand the atomic structure, X-rays, Bremsstrahlung.</li> <li>Explain nuclear reactions, kinematics of nuclear reactions, radioactive decay, fission and fusion processes.</li> <li>Describe interaction of radiations, photons, neutrons and charged particles with matter.</li> </ul>

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S. No.	Course code	Course	Course outcome
1.	BCC(P)-401	Quantum Mechanics	On completion of this course, student will be able to <ul style="list-style-type: none"> <li>Have knowledge about radiation detectors, dosimeters and radiation safety methods. Radiation Safety, detectors, radiation hazards.</li> <li>Understand the basic knowledge about non relativistic quantum mechanics.</li> </ul>
10	BSEC(P)-404	Applied Optics	On completion of this course, student will be able to <ul style="list-style-type: none"> <li>Understand the time-dependent and time-independent Schrödinger wave equation for simple potentials and harmonic oscillator.</li> <li>Show an understanding of wave mechanics in one and three dimensions. amplification, interaction.</li> <li>Describe the structure of the hydrogen atom and show an understanding of quantization of angular momentum</li> </ul>
11	BSEC(P)-304.9	Weather forecasting	On completion of this course, student will be familiar with weather forecasting techniques. <ul style="list-style-type: none"> <li>Know about spin, angular momentum states, angular momentum addition rules and identical particles.</li> </ul>

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2	BCC(P)-401 (P)	Quantum Mechanics (Physics lab)	On completion of this lab course, student have experience of experimentation with topics related to:
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S. No.	Course code	Course	Course outcome
1	BDSE(P)-501(i)	Digital-Analog Circuits and Condensed Matter Physics	<ul style="list-style-type: none"> <li>Quantization of energy and Frank Hertz Experiment.</li> <li>On completion of this course, student will be able to <ul style="list-style-type: none"> <li>Spectra of Mercury and sodium using spectrometer.</li> <li>The structure of the hydrogen atom of Digital</li> <li>Components like gratings, interference.</li> </ul> </li> </ul>
3.	BSEC(P)-404	Skill Enhancement Course-II: Applied Optics	On completion of this course, student will be able to <ul style="list-style-type: none"> <li>Understand the theory of laser action, light amplification principles and application of holography and fibre Optics's diffraction.</li> <li>Know the significance of Brillouin zones.</li> <li>Know the concept of phonons.</li> <li>Understand the phenomenon of</li> </ul>

			<p>superconductivity.</p> <ul style="list-style-type: none"> <li>• Understand the biasing of transistors and design of simple amplifier circuits.</li> <li>• Understand the current voltage characteristics of semiconductor devices.</li> <li>• Calculate cutoff frequencies and to determine bandwidth.</li> <li>• Understand the effect of positive and negative feedback on amplifier circuits.</li> </ul>
2.	<b>BDSE(P)-501(ii)</b>	<b>Solid State Physics and Electronics Devices</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Have a basic knowledge of crystal systems and spatial symmetries.</li> <li>• Understand the concept of reciprocal lattices.</li> <li>• Know the principles of structure determination by Bragg's diffraction.</li> <li>• Know the significance of Brillouin zones.</li> <li>• Know the concept of phonons.</li> <li>• Understand the phenomenon of superconductivity.</li> <li>• Understand the biasing of transistors and design of simple amplifier circuits.</li> <li>• Understand the current voltage characteristics of semiconductor devices.</li> <li>• Calculate cutoff frequencies and to determine bandwidth.</li> <li>• Understand the effect of positive and negative feedback on amplifier circuits.</li> <li>• Analyze the different oscillator circuits to determine the frequency of oscillation.</li> </ul>
3	<b>BDSE(P)-501(i)(P)/ BDSE(P)-501(ii)(P)</b>	<b>Physics lab</b>	<p>On completion of this lab course, student have experience of experimentation with topics related to</p> <ul style="list-style-type: none"> <li>• Know the principles of structure determination by Bragg's diffraction.</li> <li>• Know the significance of Brillouin zones.</li> <li>• Know the concept of phonons.</li> <li>• Understand the biasing of transistors and design of simple amplifier circuits.</li> <li>• Understand the current voltage characteristics of semiconductor devices.</li> <li>• Calculate cutoff frequencies and to determine bandwidth.</li> <li>• Understand the effect of positive and negative feedback on amplifier circuits.</li> <li>• Oscillator circuits to determine the frequency of oscillation.</li> </ul>

4	<b>BDSE(P)-501(iii)</b>	<b>Electromagnetic Theory</b>	On completion of this course, students will be able to learn electric and magnetic fields in matter and Electromagnetic Theory .
5	<b>BDSE(P)-501(iii)P</b>	<b>Electromagnetic Theory Lab</b>	On completion of this course, students will be able to learn Solenoidal experiment Electromagnetic Theory.
6	<b>BDSE(P) 601(ii)</b>	<b>Radiation Physics</b>	On completion of this course, student will be able to <ul style="list-style-type: none"> <li>• Understand the structure of the nucleus and intrinsic properties of the atomic nucleus.</li> <li>• Explain the interaction of radiation with matter.</li> <li>• Understand the concepts of radioactive decay, nuclear reactions.</li> <li>• Describe the working of radiation detectors and accelerators.</li> </ul>
7	<b>BDSE(P)-601(ii)(P)</b>	<b>Physics Lab</b>	On completion of this lab course, student have experience of experimentation with topics related to <ul style="list-style-type: none"> <li>• Studt the nuclear particles like alpha and beta using G.M.Counter.</li> <li>• Explain the interaction of radiation with matter.</li> <li>• Characteristics of BJT, FET.</li> <li>• working of radiation detectors</li> <li>• working of diodes</li> </ul>
8	<b>BDSE(P)-501(iv)</b>	<b>Special Theory of Relativity</b>	On completion of this course, students will be able to learn Special Theory of Relativity, michalson experiment., electric and magnetic fields in matter.
9	<b>BDSE(P)-501(iv)P</b>	<b>Special Theory of Relativity Lab</b>	On completion of this course, students will be able to learn Special Theory of Relativity
10	<b>BDSE(P)-501(v)</b>	<b>Applied Dynamics</b>	On completion of this course, students will be able to learn motion , mechanics and Applied Dynamics.
11	<b>BDSE(P)-501(v)P</b>	<b>Applied Dynamics Lab</b>	On completion of this course, students will be able to learn Applied Dynamics, inertia.
12	<b>BDSE(P)-501(vi)</b>	<b>Atmospheric Physics</b>	On completion of this course, students will be able to learn Atmospheric Physics
13	<b>BDSE(P)-501(vi)P</b>	<b>Atmospheric Physics Lab</b>	On completion of this course, students will be able to learn Atmospheric Physics
14	<b>BDSE(P)-501(vii)</b>	<b>Atomic And Molecular Physics</b>	On completion of this course, students will be able to learn Atomic And Molecular Physics
15	<b>BDSE(P)-501(vii)P</b>	<b>Atomic And Molecular Physics Lab</b>	On completion of this course, students will be able to learn Atomic And Molecular Physics
16	<b>BDSE(P)-501(viii)</b>	<b>Classical Dynamics</b>	On completion of this course, students will be able to learn Classical Dynamics
17	<b>BDSE(P)-501(iii)P</b>	<b>Classical Dynamics Lab</b>	On completion of this course, students will be able to learn Classical Dynamics

18	BDSE(P)-501(ix)	Computational Methods And Simulations	On completion of this course,students will be able to learn Computational Methods And Simulations
19	BDSE(P)-501(ix)P	Computational Methods And Simulations Lab	On completion of thisLab course,students will be able to learn , programming, Computational Methods And Simulations
20	BDSE(P)-501(x)	Electronics And Network Theory	On completion of this course,students will be able to learn Electronics And Network Theory
21	BDSE(P)-501(x)P	Electronics And Network Theory Lab	On completion of this lab course,students will be able to learn Electronics And Network Theory.
22	BDSE(P)-501(xi)	Experimental Techniques	On completion of this course,students will be able to learn Experimental Technique like AFm, Characterization and synthesis techniques.
23	BDSE(P)-501(xi)P	Experimental Techniques Lab	On completion of this lab course,students will be able to learn Experimental Techniques
24	BDSE(P)-501(xii)	Material Science	On completion of this course,students will be able to learn Material Science,
25	BDSE(P)-501(xii)P	Material Science Lab	On completion of this lab course,students will be able to learn Material Science
26	BDSE(P)-501(xiii)	Medical Physics	On completion of this course,students will be able to learn Medical Physics
27	BDSE(P)-501(xiii) P	Medical Physics Lab	On completion of this lab course,students will be able to learn Medical Physics
28	BDSE(P)-501(xiv)	Embedded System: Introductions To microcontrollers	On completion of this course,students will be able to learn Embedded System: Introductions To microcontrollers
29	BDSE(P)-501(xiv) P	Embedded System: Introductions To microcontrollers Lab	On completion of this lab course,students will be able to learn Embedded System: Introductions To microcontrollers
30	BDSE(P)-501(xv)	Nano Materials and Applications	On completion of this course,students will be able to learn Nano Materials and Applications
31	BDSE(P)-501(xv)P	Nano Materials and Applications Lab	On completion of thislab course,students will be able to learn Nano Materials and Applications
32	BDSE(P)-501(xvi)	Nuclear Physics	On completion of this course, student will be able to <ul style="list-style-type: none"> <li>• understand nuclear properties such as binding energy, nuclear moments.</li> <li>• understand the Constituents of nucleus.</li> <li>• Modes of decay of radioactive nuclides.</li> <li>• Understand the decay Laws.</li> </ul>
33	BDSE(P)-501(xvi)P	Nuclear Physics Lab	On completion of this course, student will be able to <ul style="list-style-type: none"> <li>• detect nuclear particles using G,M counter.</li> <li>• Understand nuclear particles can be detected with the help of detectors</li> </ul>
34	BDSE(P)-501(xvii)	Particle Physics	On completion of this course, student will be able to

			<ul style="list-style-type: none"> <li>• understand nuclear properties s</li> <li>• Understand the decay Laws.</li> <li>• understand nature about particle and antiparticles.</li> <li>• how particle and antiparticles exist in nature.</li> </ul>
35	<b>BDSE(P)-501(xvii)P</b>	<b>Particle Physics Lab</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• detect nuclear particles using G,M counter.</li> <li>• Understand ow nuclear particles can be detected with the help of detectors</li> </ul>
36	<b>BDSE(P)-601(i)</b>	<b>Nuclear &amp; Particle Physics</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the fundamental aspects of the structure of the nucleus and intrinsic properties of the atomic nucleus.</li> <li>• Explain the interaction of radiation with matter.</li> <li>• Understand the concepts of radioactive decay, nuclear reactions.</li> <li>• Describe the working of radiation detectors and accelerators.</li> <li>• Understand the classification and properties of elementary particles.</li> <li>• Recognize that all leptons and quarks have corresponding antiparticles.</li> <li>• Understand that quarks and antiquarks combine to form baryons, antibaryons and mesons.</li> <li>• Discuss the conservation laws obeyed by elementary particles.</li> </ul>
37	<b>BDSE(P)-601(i)(P)</b>	<b>Physics LAb</b>	<p>On completion of this lab course, student have experience of experimentation with topics related to</p> <ul style="list-style-type: none"> <li>• Studt the nuclear particles like alpha and beta using G.M.Counter.</li> <li>• Explain the interaction of radiation with matter.</li> </ul>
38	<b>BSEC(P)-504</b>	<b>Skill Enhancement Course-III: Basic Instrumentation Skills</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Explain types of errors, specifications and significance of multimeter and voltmeter.</li> <li>• Describe types of millivoltmeters and their significance, features of CRO and CRT.</li> <li>• Understand the working of impedance bridges and digital instruments.</li> </ul>

## SEMESTER-VI

S. No.	Course code	Course	Course outcome
1.	BDSE(P)-601(i)	Nuclear & Particle Physics	On completion of this course, student will be able to <ul style="list-style-type: none"><li>• Understand the fundamental aspects of the structure of the nucleus and intrinsic properties of the atomic nucleus.</li><li>• Explain the interaction of radiation with matter.</li><li>• Understand the concepts of radioactive decay, nuclear reactions.</li><li>• Describe the working of radiation detectors and accelerators.</li><li>• Understand the classification and properties of elementary particles.</li><li>• Recognize that all leptons and quarks have corresponding antiparticles.</li><li>• Understand that quarks and antiquarks combine to form baryons, antibaryons and mesons.</li><li>• Discuss the conservation laws obeyed by elementary particles.</li></ul>
2	BDSE(P) 601(ii)	Radiation Physics	On completion of this course, student will be able to <ul style="list-style-type: none"><li>• Understand the structure of the nucleus and intrinsic properties of the atomic nucleus.</li><li>• Explain the interaction of radiation with matter.</li><li>• Understand the concepts of radioactive decay, nuclear reactions.</li><li>• Describe the working of radiation detectors and accelerators.</li></ul>
3	BDSE(P)-601(i)(P)/ BDSE(P)-601(ii)(P)	Physics LAB	On completion of this lab course, student have experience of experimentation with topics related to <ul style="list-style-type: none"><li>• Studt the nuclear particles like alpha and beta using G.M.Counter.</li><li>• Explain the interaction of radiation with matter.</li><li>• Characteristics of BJT, FET.</li><li>• working of radiation detectors</li><li>• working of diodes</li></ul>
3.	BSEC(P)-604	Skill Enhancement Course-IV:	On completion of this course, student will be able to <ul style="list-style-type: none"><li>• Understand the atomic structure, X-rays,</li></ul>

		<b>Radiation Safety</b>	<p>Bremstrahlung.</p> <ul style="list-style-type: none"> <li>• Explain nuclear reactions, kinematics of nuclear reactions, radioactive decay, fission and fusion processes.</li> <li>• Describe interaction of radiations, photons, neutrons and charged particles with matter.</li> <li>• Have knowledge about radiation detectors, dosimeters and radiation safety methods.</li> </ul>
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### Course Outcome for B. Sc. Medical (Subject Botany)

Course Code	Course	Course Outcome
<b>BCC(B)-101</b>	<b>Biodiversity (Microbes, Algae, Fungi and Archegoniatae)</b>	To acquaint the students about the study of various microorganisms, Algae and Fungi.
<b>BAECC-105</b>	<b>Environmental Science</b>	The major objective is to sensitise students for environment consciousness and sustainability as well as ethics regarding self and society.
<b>BCC(B)-201</b>	<b>Cell and Molecular Biology</b>	To acquaint the student about the study of the Biomolecules, plant cell structure, function and cell organelles
<b>BAECC-206</b>	<b>Drug Abuse: Problem, Management and Prevention</b>	The major objective we are able to sensitise students against problems associated with drugs. It describes about the psychological, physical and social effects of psychoactive substances on person using it and its prevention and recovery
<b>BCC(B)-301</b>	<b>Plant anatomy and Embryology</b>	To impart knowledge about various aspects of anatomical and embryological studies in plants.
<b>BSEC(B)-304</b>	<b>Mushroom Culture and Technology</b>	To impart theoretical as well as practical knowledge regarding various aspects of mushroom cultivation.
<b>BCC(B)-401</b>	<b>Plant Physiology and Metabolism</b>	To impart knowledge about the keys, floras and other standards used in plant taxonomy, and also enhance the practical knowledge about plant ecology.
<b>BSEC(B)-404</b>	<b>Nursery and Gardening</b>	To impart theoretical as well as practical knowledge regarding various aspects of nursery and gardening.
<b>DSE(B)-501 (i, ii)</b>	<b>i. Research Methodology</b>	To impart knowledge about various aspects of research and to impart knowledge about

	<b>ii. Plant Ecology and Taxonomy</b>	separation techniques, Microscopy and other laboratory techniques. To impart knowledge about the keys, floras and other standards used in plant taxonomy, and also enhance the practical knowledge about plant ecology.
<b>BSEC(B)-504</b>	<b>Floriculture</b>	To impart knowledge about various aspects of scope and importance of floriculture, propagation, soil, nutrition and pest of flowers like rose, gladiolus, etc.
<b>BDSE(B)-601 (i, ii)</b>	<b>i. Economic Botany and Biotechnology</b> <b>ii. Dissertation*</b>	To enlighten the students with traditional economic plants and also impart knowledge about recent techniques used in plant sciences. To enhance the practical knowledge with a given assignment/ project/ dissertation

## **Program Name: B. Sc. (Honors.) Mathematics**

### **PROGRAM OUTCOME**

PO 1: Students apply their broad knowledge of science across a range of fields, with in-depth knowledge in at least one area of study, while demonstrating an understanding of the local and global contexts in which science is practiced.

PO 2: Student will be able to communicate effectively about mathematics to both lay and expert audiences utilizing appropriate information and communication technology.

PO 3: Student will be able to work independently, and to collaborate effectively in team work and team building.

PO 4: Student will be able to conduct self-evaluation, and continuously enrich themselves through lifelong learning.

PO 5: Student will be able to cultivate a mathematical attitude and nurture the interests.

### **PROGRAMME EDUCATIONAL OBJECTIVES:**

PEO 1 It provides students with the strong base in Mathematics, computer Science, Statistics and other basic science to successfully pursue postgraduation in Mathematics and other related degrees.

PEO 2 The graduates will become successful professionals by demonstrating logical and analytical thinking abilities.

PEO 3 The graduates will work and communicate effectively in inter-disciplinary environment, either independently or in a team, and demonstrate leadership qualities.

PEO 4 The graduates will engage in life-long learning and professional development through self-study, continuing education or professional and doctoral level studies.

PEO 5 The students will be able to compete for jobs.

### PROGRAM SPECIFIC OUTCOMES:

PSO 1: Student will be able to explain the core ideas and the techniques of mathematics at the college level.

PSO 2: Student will be able to recognize the power of abstraction and generalization, and to carry out investigative mathematical work with independent judgment.

PSO 3: Student will be able to setup mathematical models of real world problems and obtain solutions in structured and analytical approaches with independent judgment.

PSO 4: Student will be able to carry out objective analysis and prediction of quantitative information with independent judgment.

PSO 5: The courses give them in-depth knowledge in theoretical aspects of the subject

PSO 6 : The students are exposed to the application of the subject in various fields like industry, agriculture and population studies, Also, the students are trained in using software packages.

Course Code	Course	Course Outcome
BHMCC-101	CALCULUS-I	<ol style="list-style-type: none"><li>1. Find the higher order derivative of the product of two functions.</li><li>2. Conceive the concept of asymptotes and obtain their equations.</li><li>3. Learn about the tracing of curves in Cartesian and polar form. partial derivatives and its applications.</li><li>4. Find the area under a given curve, length of an arc of a curve when the equations are given in parametric and polar form.</li><li>5. Find the area and volume by applying the techniques of double and triple integrals</li></ol>
BHMCC-102	MATRICES & THEORY OF EQUATIONS.	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"><li>1. solve a System of Linear equations using the inverse of a matrix</li><li>2. Familiarize characteristic roots and characteristic vectors.</li><li>3. To find the inverse of a matrix by Cayley-Hamilton theorem.<ol style="list-style-type: none"><li>a. Analyze different forms of equations and finding their roots</li><li>b. Understand relation between roots and coefficients</li></ol></li><li>4. Derive methods for finding the solution of cubic and bi-quadratic</li></ol>

		equations.
BHMCC-201	CALCULUS-II	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"> <li>1. Find the double integral in polar form and triple integral in rectangular, cylindrical and spherical form.</li> <li>2. Conceive the concept of convergence of series.</li> <li>3. Learn about limit continuity and differentiability of several variable.</li> <li>4. Determine gradient vector fields and find potential functions.</li> <li>5. find the equation to tangent, normal at a point on a conic</li> </ol>
BHMCC-202	COORDINATE GEOMETRY	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"> <li>1. Find the polar equation of a line, circle, tangent and normal to conics.</li> <li>2. Find the tangent line tangent plane, angle of intersection of two spheres and radical planes.</li> <li>3. Learn about concepts of cylinder.</li> </ol>
BHMCC-301	LINEAR ALGEBRA	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"> <li>1. Understand the idea about vector space and metric space</li> <li>2. Analyze finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces</li> <li>3. Use the definition and properties of linear transformations.</li> <li>4. Describe the matrices of linear transformations and change of basis, including kernel, range and isomorphism.</li> <li>5. Compute with the characteristic polynomial, eigen-vectors, eigen-values and Eigen spaces.</li> <li>6. Compute the geometric and the algebraic multiplicities of an eigen-values and apply the basic diagonalization result</li> </ol>
BHMCC-302	ANALYSIS-I	Upon completion of this course, students should be

		<p>able to:</p> <ol style="list-style-type: none"> <li>1. Describe the real line as a complete, ordered field</li> <li>2. Determine the basic topological properties of subsets of the real numbers</li> <li>3. Use the definitions of convergence as they apply to sequences, and functions,</li> <li>4. Determine the continuity, differentiability</li> <li>5. Expand a function using Taylor's and Maclaurin's series.</li> <li>6. Recall the defining properties of a metric space, and determine whether a given function defines a metric</li> <li>7. Determine how that a function is or is not a metric</li> <li>8. Show that a set in a metric space is or is not open and/or closed</li> <li>9. Show that a function between metric spaces is or is not continuous</li> <li>10. Show that a sequence in a metric space is or is not convergent</li> <li>11. Show that a metric space is or is not complete</li> <li>12. Familiarize with open sets, closed sets and Cantor set</li> </ol>
BHMCC-303	ORDINARY DIFFERENTIAL EQUATIONS	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Obtain an integrating factor which may reduce a given differential equation into an exact one and eventually provide its solution.</li> <li>2. Identify and obtain the solution of Clairaut's equation.</li> <li>3. Find the complementary function and particular integrals of linear differential equation.</li> <li>4. Familiarize the orthogonal trajectory of the system of curves on a given surface.</li> </ol>
BHMCC-304	TRANSPORTATION AND GAME THEORY	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"> <li>1. Method of solution of the differential equation. Learn to find the optimal solution of Transportation Problem assignment Problems and game theory</li> </ol>
BHMCC-401	ANALYSIS-II	<p>After completing this course the learner should be able to</p>

		<ol style="list-style-type: none"> <li>1. Understand Integrability and theorems on integrability</li> <li>2. Recognize the difference between pointwise and uniform convergence of a sequence of functions</li> <li>3. Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability</li> <li>4. Develops a knowledge about Riemann Integration and applies into problems</li> <li>5. Determine the Riemann integrability and prove a selection of theorems concerning integration.</li> <li>6. Learn about convergence of improper integral and uniform convergence sequence and series of function.</li> </ol>
BHMCC-402	ALGEBRA	<p>After the completion of this course the student will be able to</p> <ol style="list-style-type: none"> <li>1. Assess properties implied by the definitions of groups and rings,</li> <li>2. Use various canonical types of groups (including cyclic groups and groups of permutations) and canonical types of rings (including polynomial rings and modular rings),</li> <li>3. Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups,</li> <li>4. Analyze and demonstrate examples of ideals and quotient rings,</li> <li>5. Use the concepts of isomorphism and homomorphism for groups and rings</li> </ol>
BHMCC-403	NUMERICAL METHODS	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"> <li>1. Derive numerical methods for approximating the solution of problems of continuous mathematics,</li> <li>2. Analyze the error incumbent in any such numerical approximation,</li> <li>3. Implement a variety of numerical algorithms using appropriate technology</li> <li>4. Compare the viability of different approaches to the numerical solution of problems arising in roots of solution of non-linear equations, interpolation and</li> </ol>

		approximation, numerical differentiation and integration, solution of linear systems.
BHMCC-404	NUMBER THEORY	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"> <li>1. Learn about the division algorithm</li> <li>2. Explain the basic properties of congruence</li> <li>3. Implement the application of Euclidean algorithm and various theorems related to the topic.</li> </ol>
BHMCC-501	LINEAR ALGEBRA	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>7. Understand the idea about vector space and metric space</li> <li>8. Analyze finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces</li> <li>9. Use the definition and properties of linear transformations.</li> <li>10. Describe the matrices of linear transformations and change of basis, including kernel, range and isomorphism.</li> <li>11. Compute with the characteristic polynomial, eigen-vectors, eigen-values and Eigen spaces.</li> <li>12. Compute the geometric and the algebraic multiplicities of an eigen-values and apply the basic diagonalization result</li> </ol>
BHMCC-502	PARTIAL DIFFERENTIAL EQUATIONS & ITS APPLICATIONS	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the origin of partial differential equation and distinguish the integrals of first order linear partial differential equation into complete, general and singular integrals.</li> <li>2. Use Lagrange's method for solving the first order linear partial differential equation</li> <li>3. Solve differential equations of first order using graphical, numerical, and analytical methods.</li> </ol>

		<ol style="list-style-type: none"> <li>4. Solve linear and non-linear differential equations of second and higher order</li> <li>5. Solve linear differential equations using the Charpit method.</li> <li>6. Find Fourier series solutions.</li> <li>7. Solve the Heat, Wave and Laplace equation by using method of separation of variables.</li> </ol>
BHMCC-503	DISCRETE MATHEMATICS	<p>After the completion of this course the student will be able to</p> <ol style="list-style-type: none"> <li>1. Understand the new topics Graph Theory, Poset and Lattices</li> <li>2. Understand the basic concepts of graphs, directed graphs, and weighted graphs and able to present a graph by matrices</li> <li>3. Understand the properties of trees and able to find a minimal spanning tree for a given weighted graph</li> <li>4. Understand Eulerian and Hamiltonian graphs.</li> <li>5. Understand the concept of Recurrence Relation and generating functions.</li> <li>6. Learn the concept of Boolean function and its application to logic gates.</li> </ol>
BHMCC-504	LEBESGUE INTEGRATION &FOURIER SERIES	<p>After the completion of this course the student will be able to</p> <ol style="list-style-type: none"> <li>1. Understand the concept of outer measure Measurable sets, Lebesgue measure, construction of non-measurable sets.</li> <li>2. Learn about the concept of measurable functions and lebesgue integration of various functions</li> <li>3. Conceive the concept of functions of bounded variation and orthogonal and orthonormal system of functions.</li> </ol>
BHMCC-505	NUMBER THEORY-I	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"> <li>4. Learn about the division algorithm</li> <li>5. Explain the basic properties of congruence</li> <li>6. Implement the application of Euclidean algorithm and various theorems related to the topic.</li> <li>7. Learn about the concept of divisibility, congruence, residue classes, arithmetic functions and various theorems</li> </ol>

		8. Find the solution of Diophantine equations and farey sequences
BHMCC-601	CALCULUS OF SEVERAL VARIABLES & IMPROPER INTEGRALS	<p>After the completion of this course the student will be able to</p> <ol style="list-style-type: none"> <li>1. Learn about the concept of Limit and continuity of functions of severable, partial derivatives, directional derivatives, derivatives and their elementary properties.</li> <li>2. Learn the proof and application of Mean value theorem for differentiable functions.</li> <li>3. Find the Higher order derivatives, Taylor's Theorem for function of n-variables. Inverse function theorem, Implicit function theorem.</li> <li>4. Determine the Maxima and Minima using the method of Lagrange multipliers.</li> <li>5. Find the Riemann integral of a bounded function in <math>\mathbf{R}_n</math>.</li> <li>6. Understand Lebesgue's criterion for existence of a multiple Riemann Integral.</li> <li>7. Learn about the convergence Improper integrals.</li> <li>4.</li> </ol>
BHMCC-602	RING & MODULES	<p>After the completion of this course the student will be able to</p> <ol style="list-style-type: none"> <li>1. Understand the concept of Rings, sub rings, Sum of Rings, Characteristics of Ring, Product of Rings, Ideals, and algebra of Ideals.</li> <li>2. Learn the concept of Quotient Rings, Homomorphism of Rings, Imbedding of Rings,Maximal Ideal. Euclidean domains, Prime and Irreducible elements, Polynomial Rings, Greatest common divisor, Unique Factorization domains.</li> <li>3. Learn the concept of Modules, sub modules, Direct sum of Modules, Quotient modules, Free modules, Comparison with vector spaces, Homomorphism's, Simple Modules.</li> </ol>
BHMCC-603	NUMBER THEORY-II	<p>After the completion of this course the student will be able to</p> <ol style="list-style-type: none"> <li>1. Understand about Continued fractions, periodic continued fractions, approximations of irrationals by rational, Pell's equation, Partitions. Ferrer's graphs, generating functions, Euler's identity, Jacobi's Triple Product formula.</li> </ol>

		<ol style="list-style-type: none"> <li>2. Learn the concept of Binary quadratic forms, positive definite binary quadratic forms. Hermite's estimate on the minima of positive definite quadratic forms and its application.</li> <li>3. Conceive the concept of Minkowski's Theorem in Geometry of Numbers and its applications.</li> </ol>
BHMCC-604	PROBABILITY & STATISTICS	<p>After the completion of this course the student will be able to</p> <ol style="list-style-type: none"> <li>1. Understand the basic concepts of probability.</li> <li>2. Find mathematical expectation, moments, moment generating function, characteristic function.</li> <li>3. Conceive the concepts of Uniform, Binomial, Poisson, Geometric, Negative binomial and Normal and its applications.</li> <li>4. Find the correlation coefficient, multiple correlation coefficients, joint moment generating function (jmgf) and calculation of covariance (from jmgf), linear regression for two variables.</li> </ol>
BHMCC-605	MECHANICS	<p>After the completion of this course the student will be able to</p> <ol style="list-style-type: none"> <li>1. Understand the concept of Force, Moment of a force, couple.</li> <li>2. Find the general equations of equilibrium.</li> <li>3. Solve the problems arising from structures.</li> <li>4. Understand Laws of Coulomb friction and their application to simple and complex surface learn the concept of power.</li> <li>5. Understand the relation between second moments and products of area, polar moment of area, principal axes.</li> </ol>

## **Program Name: B. Sc. (C.S.M) (2019-20)**

B.Sc CSM

### **PROGRAM OUTCOMES**

After the successful completion of this course students will be able

PO 1: To apply critical thinking skills to solve problems that can be modeled mathematically,

PO2: To critically interpret numerical and graphical data, to read and construct mathematical arguments and proofs,

PO 3:To use computer technology appropriately to solve problems and to apply mathematical knowledge to a career related to mathematical sciences or in post - bacalaureate studies.

PO5:They will able to understand and apply the fundamental principles, concepts and methods of statistics in key areas of science and multidisciplinary fields.

PO 6:Demonstrate problem solving, analytical and logical skills to provide solutions for the scientific requirements.

PO 7:Apply theoretical concepts to design experiments and develop programs.

### **PROGRAM EDUCATIONAL OBJECTIVES (CSM)**

PEO 1. To provide graduates with a solid foundation in computer science, mathematics, and Statistics which will allow them to successfully pursue post graduate studies in computer science, mathematics, statistics or other related degrees.

PEO 2. Allow them to successfully compete for quality jobs in all functions of computer science, ranging from software developer to customer support, or mathematics teacher

PEO 3. To equip graduates with life-long learning skills, which will allow them to successfully adapt to the evolving technologies throughout their professional careers.

PEO 4. To equip graduates with communication skills, which will allow them to collaborate effectively with other members of a team.

PEO 5. To provide graduates with the broad education necessary to understand the impact of computer technology in a global and societal context.

### **PROGRAM SPECIFIC OUTCOMES:**

PSO 1:B.Sc. graduates apply their broad knowledge of science across a range of fields, with in-depth knowledge in at least one area of study, while demonstrating an understanding of the local and global contexts in which science is practiced.

PO 2 The main objective of this course is to cultivate statistical thinking among students by acquainting them with various statistical methods and their applications in different fields. PO 3 The courses give them in-depth knowledge in theoretical aspects of the subject

PO 4 : the students are exposed to the application of the subject in various fields like industry, agriculture and population studies.

PO 5: Also, the students are trained in using software packages for data analysis.

Course code	Course	Course outcome
BSCSM (S)102	STATISTICAL METHODS	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. To understand the basic concepts of statistics and data collections.</li> <li>2. Summarize data graphically by displaying data using methods from descriptive statistics, interpreting data in tables graphically by using histograms, frequency distributions.</li> <li>3. How to calculate and apply measures of location and measures of dispersion -- grouped and ungrouped data cases.</li> <li>4. Identify shape of a distribution of data.</li> <li>5. Compute and interpret the results of Bivariate Regression and Correlation Analysis.</li> <li>6. To understand time series, and to define index numbers- explain its uses and methods.</li> </ol>
BSCSM (M) 103 (same for B.Sc. (NM) and B.A.)	MATRICES & CALCULUS	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand matrices and their application to system of linear equations.</li> <li>2. Familiarize with characteristic roots and characteristic vectors.</li> <li>3. To find the inverse of a matrix by Cayley-Hamilton theorem.</li> <li>4. Learn about limit continuity, uniform continuity, discontinuity and differentiability.</li> <li>5. Learn the concept of asymptotes and obtain their equations.</li> <li>6. Learn about the tracing of curves.</li> </ol>
BSCSM (S)202	PROBABILITY THEORY	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the basic</li> </ol>

		<p>concepts of probability and random variables.</p> <ol style="list-style-type: none"> <li>2. Understand difference between subjective, relative frequency, and classical probabilities and be able to identify which approach was used to assign a probability in a given scenario.</li> <li>3. Identify from a probability scenario events that are simple, complementary, mutually exclusive, and independent.</li> <li>4. Explain the difference between events that are mutually exclusive and independent.</li> <li>5. Correctly apply multiplication rule for two independent events, the addition rule for union of two events, and the Baye's Theorem.</li> <li>6. Calculate the marginal/joint probability mass/ density function, conditional probability density function and conditional probability distribution function for discrete/continuous random variables.</li> <li>7. Calculate expectation, mean, variance and moment generating function of continuous and discrete distributions.</li> <li>8. Calculate probabilities and expectation for discrete( Binomial, Poisson, negative Binomial, Geometric and Hyper geometric distribution) and continuous ( Uniform, Normal, Exponential distribution).</li> <li>9. Approximate Binomial probabilities by Poisson probabilities.</li> <li>10. Use Normal approximation to approximate Binomial probabilities.</li> <li>11. Applications of the memory less property of an exponential random variable.</li> </ol>
<p>BSCSM (M)203 (same for B.Sc. (NM) and B.A.)</p>	<p>THEORY OF EQUATIONS &amp; ORDINARY DIFFERENTIAL EQUATIONS</p>	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Analyze different forms of equations and finding their roots</li> <li>2. Understand relation between roots and coefficients</li> <li>3. Derive methods for finding the solution of cubic and bi-quadratic equations.</li> <li>4. Understand De Moivre's theorem and its applications.</li> <li>5. Familiarize with first order and higher order differential equations.</li> <li>6. Solve first order and higher degree</li> </ol>

		differential equations.
BSCSM CC(S) 302	STATISTICAL INFERENCE-I	<p>Upon successful completion, students will have the knowledge and skills to:</p> <ol style="list-style-type: none"> <li>1. Recognize the difference between a population and a sample, and between a parameter and a statistic</li> <li>2. Explain in detail the notation of a parametric model and point estimation of the parameters of those models.</li> <li>3. Explain in detail the demonstrate approaches to include a measure of accuracy for estimation procedures and our confidence in them by examining the area of interval estimation.</li> <li>4. Applications of Neyman-Factorization theorem.</li> <li>5. Demonstrate understanding of the theory of maximum likelihood estimation for a scalar parameter.</li> <li>6. Correctly identify the appropriate null and alternative hypotheses, including one or two sided, for a given study objective</li> <li>7. Identify correctly what the Type I and Type II errors would be when presented with the results of a statistical study.</li> <li>8. Explain how sample size, level of confidence, and standard deviation can affect width of confidence intervals (one proportion, one mean, and two mean difference).</li> <li>9. From a given set of summary statistics, calculate the Z test statistic and p-value, and make the appropriate statistical decision for one proportion, one mean, and two mean differences.</li> <li>10. Ability to conduct appropriate hypothesis tests for comparing two or more means.</li> <li>11. Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit.</li> <li>12. Explain contextually that the p-value is the result of the sample producing a sample statistic with a large difference from the hypothesized value and that this difference was unlikely to be obtained if the hypothesized value was true.</li> <li>13. Perform all of the steps in a hypothesis test of independence of two categorical variables from contingency table data, from formulating proper hypotheses to calculating</li> </ol>

		<p>expected counts under the null hypothesis to calculating the chi-squared statistic to interpreting the value of the statistic.</p>
<p>BSCSM CC (M)303 (same for B.Sc. (NM) and B.A.)</p>	<p>REAL ANALYSIS</p>	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the real line as a complete, ordered field.</li> <li>2. Determine the basic topological properties of subsets of the real numbers.</li> <li>3. Use the definitions of convergence as they apply to sequences, series and functions.</li> <li>4. Understand uniform convergence.</li> </ol>
<p>BSCSM SEC (S)305</p>	<p>Probability Theory-II</p>	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the advanced concepts of Probability and random variable.</li> <li>2. Applications of CS, Holder, Chebyshev's, Jensen, Liapounov inequalities in practical situations.</li> <li>3. Understand the difference between Weak law of large numbers and Strong law of large number with respect to probability.</li> <li>4. Applications of CLT</li> </ol>
<p>BSCSM SEC (M)306 (same for B.Sc. (NM) and B.A.)</p>	<p>TRANSPORTATION AND GAME THEORY</p>	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"> <li>2. Method of solution of the differential equation. Learn to find the optimal solution of Transportation Problem assignment Problems and game theory</li> </ol>
<p>BSCSM CC(S) 402</p>	<p>SAMPLING TECHNIQUES</p>	<p>Upon successful completion, students will have the knowledge and skills to:</p> <ol style="list-style-type: none"> <li>1. Students can identify the population of interest, parameter, sample and statistics from a study.</li> <li>2. Distinguish between an observational study and an experiment.</li> <li>3. Identify whether a probability sampling method or a non-probability sampling method was used to obtain the study data.</li> <li>4. Determine if the probability method used to obtain data was a simple random sample, stratified, or cluster.</li> </ol>

		<ol style="list-style-type: none"> <li>5. Explain the difference between random assignment and random selection and how these two concepts affect inference.</li> <li>6. Given a study, recognize if potential biases such as response, nonresponse, or selection exist.</li> <li>7. Calculate an approximate margin of error for a sample survey.</li> </ol>
<p>BSCSM CC(M) 403 (same for B.Sc. (NM) and B.A.)</p>	ALGEBRA	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Assess properties implied by the definitions of groups and rings.</li> <li>2. Use various canonical types of groups (including cyclic groups and groups of permutations) and canonical types of rings (including polynomial rings and modular rings).</li> <li>3. Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups.</li> <li>4. Use the concepts of isomorphism and homomorphism for groups.</li> </ol>
<p>BSCSM EC(S)405</p>	Industrial Statistics	<p>Upon completion of this course, students should be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Understand the concept of SQC, Process Control, Product Control, Producer's &amp; Consumer's Risks 3-<math>\sigma</math> Control Limits, Tolerance and Specification limits.</li> <li><input type="checkbox"/> Applications of d-Chart, p-Chart, c-Chart</li> <li><input type="checkbox"/> Understand the concept of AQL, LTPD, AOQ, AOQL, ASN and OC functions, Single and Double Sampling Plans.</li> </ul>
<p>BSCSM (M)406(A) (same for B.Sc. (NM) and B.A.)</p>	NUMBER THEORY	<p>After completing this course the learner should be able to</p> <ol style="list-style-type: none"> <li>9. Learn about the division algorithm</li> <li>10. Explain the basic properties of congruence</li> <li>11. Implement the application of Euclidean algorithm and various theorems related to the topic.</li> </ol>
<p>BSCSM (M)406(B) (same for B.Sc. (NM) and B.A.)</p>	Statistical methods	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. To understand the basic concepts of statistics and data collections.</li> <li>2. Summarize data graphically by displaying data using methods from descriptive statistics, interpreting data in tables</li> </ol>

		<p>graphically by using histograms, frequency distributions.</p> <ol style="list-style-type: none"> <li>How to calculate and apply measures of location and measures of dispersion -- grouped and ungrouped data cases.</li> <li>Identify shape of a distribution of data.</li> </ol>
BSCSM DSE(S)502	LINEAR PROGRAMMING	<p>Upon successful completion, students will have the knowledge and skills to:</p> <ol style="list-style-type: none"> <li>Formulate optimization problems.</li> <li>Understand and apply the concept of optimality criteria for various type of optimization problems.</li> <li>Solve various constrained and unconstrained problems in single variable as well as multivariable.</li> <li>Solve the transportation and assignment problems.</li> <li>Apply the methods of optimization in real life situation.</li> <li>Solve the Non-linear problems based on real life situations.</li> </ol>
BSCSM DSE(M)503(A) (same for B.Sc. (NM) and B.A.)	GEOMETRY AND VECTOR CALCULUS	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>Determine gradient vector fields and find potential functions.</li> <li>find the equation to tangent, normal at a point on a conic</li> <li>Find the polar, tangent and normal to conics.</li> <li>Find the tangent line tangent plane, angle of intersection of two spheres and radical planes.</li> <li>about concepts of cylinder, Cone and their properties</li> </ol>
BSCSM DSE(M)503(B) (same for B.Sc. (NM) and B.A.)	METRIC SPACES	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>Describe the real line as a complete, ordered field.</li> <li>Determine the basic topological properties of subsets of the real numbers.</li> <li>Use the definitions of convergence as they apply to sequences, and functions.</li> <li>Determine the continuity, uniform continuity and discontinuity.</li> <li>Learn the defining properties of a metric space and determine whether a given function defines a metric.</li> <li>Determine how that a function is or is not a metric.</li> </ol>

		<p>7. Show that a set in a metric space is or is not open and/or closed.</p> <p>8. Show that a function between metric spaces is or is not continuous.</p> <p>9. Show that a sequence in a metric space is or is not convergent.</p> <p>10. Show that a metric space is or is not complete.</p> <p>11. Familiarize with open sets, closed sets and Cantor set.</p> <p>12. Learn about the concept of compactness, connectedness and their properties.</p>
BSCSM CC(S)505	Vital Statistics	<p>Upon completion of this course, students should be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Obtain Vital Statistics</li> <li><input type="checkbox"/> Measures Fertility rate, Mortality rate, Gross and Net Reproduction Rate</li> <li><input type="checkbox"/> Construction of Life Tables and its Uses</li> <li><input type="checkbox"/> Concept of Stationary and Stable Population</li> <li><input type="checkbox"/> Concept of Pearls Vital Index</li> </ul>
BSCSM SEC(M)506(A) (same for B.Sc. (NM) and B.A.)	Vector Space	<p>Upon completion of the course the students will be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Understand the idea about vector space.</li> <li><input type="checkbox"/> Analyse finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces</li> <li><input type="checkbox"/> Use the definition and properties of linear transformations and matrices of linear transformations and change of basis</li> </ul>
BSCSM SEC(M)506(B) (same for B.Sc. (NM) and B.A.)	Laplace transform and its applications	<p>The student will be able to</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Find general solutions of ordinary differential equations using Laplace Transforms.</li> <li><input type="checkbox"/> Determine Laplace transforms and inverse Laplace transforms of various functions.</li> <li><input type="checkbox"/> Understand and recall the properties of the Heaviside (unit step) function and its applications.</li> <li><input type="checkbox"/> Understand the concept of Laplace Transforms of Derivatives and Integrals.</li> </ul>
BSCSM DSE(S)602	DESIGNS OF EXPERIMENT	<p>Upon successful completion, students will have the knowledge and skills to:</p> <ol style="list-style-type: none"> <li>1. Recognize the situation in which the analysis of variance (ANOVA) is appropriate and be able to perform one-way ANOVA</li> <li>2. Recognize the situation in which the analysis of variance (ANOVA) is appropriate and be able to perform one-way ANOVA and two way</li> </ol>

		<p>ANOVA.</p> <ol style="list-style-type: none"> <li>3. Encounter the principles of randomisation, replication and stratification, and understand how they apply to practical examples.</li> <li>4. Explore the general theory of factorial and block designs and understand this theory sufficiently to find appropriate designs for specific applications.</li> <li>5. Statistical analysis of all the particular designs that were introduced (including interpretation of e.g. block effects or interaction effects, adapted to the design).</li> <li>6. Evaluate designs using common optimality criteria and used them to critically compare competing designs.</li> </ol>
<p>BSCSM DSE(M)603(A) (same for B.Sc. (NM) and B.A.)</p>	<p>INTEGRAL CALCULUS</p>	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Integrate hyperbolic and inverse hyperbolic functions.</li> <li>2. Evaluate Reduction formulae for integrals of rational, trigonometric, exponential and logarithmic functions and their combinations.</li> <li>3. Understand the concept of quadrature, rectification, Improper integrals and their convergence.</li> <li>4. Develops a knowledge about Riemann Integration and applies into problems</li> <li>5. Determine the Riemann inerrability and prove a selection of theorems concerning integration.</li> <li>6. Find double and triple integrals and their applications to evaluation of areas and volume.</li> </ol>
<p>BSCSM DSE(M)603(B) (same for B.Sc. (NM) and B.A.)</p>	<p>PARTIAL DIFFERENTIAL EQUATIONS &amp; ITS APPLICATIONS</p>	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Describe the origin of partial differential equation and distinguish the integrals of first order linear partial differential equation into complete, general and singular integrals.</li> <li>2. Use Lagrange's method for solving the first order linear partial differential equation.</li> <li>3. Solve differential equations of first order using graphical, numerical, and analytical methods.</li> <li>4.</li> </ol> <ul style="list-style-type: none"> <li>• Solve and apply linear differential equations of second order (and higher).</li> </ul>

		<ul style="list-style-type: none"> <li>• Solve linear differential equations using the Charpit method.</li> <li>• Find Fourier series solutions.</li> <li>• Develop the ability to apply differential equations to significant applied and/or theoretical problems.</li> </ul> <p>5. Demonstrate their ability to write coherent mathematical proofs and scientific arguments needed to communicate the results obtained from differential equation models.</p>
BSCSM SEC(S)605	Optimization Technique-I	<p>Upon completion of this course, students should be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Understand the Concept of Queueing Models.</li> <li><input type="checkbox"/> Concept of Poisson arrivals and Exponential Service Times.</li> <li><input type="checkbox"/> Develop the queueing model for Poisson arrivals and Exponential Service Times with one /more than one server with finite /infinite capacity of system</li> <li><input type="checkbox"/> Assign the n jobs on 2 machines, 3 machines.</li> <li><input type="checkbox"/> Assign the 2 jobs on m machines</li> </ul>
BSCSM SEC(M)606(A) (same for B.Sc. (NM) and B.A.)	Some Special Function	<p>Upon completion of this course, students should be able to:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Use Legendre Polynomial to find series solution of equations.</li> <li><input type="checkbox"/> Understand the Laguerre polynomial and its properties.</li> <li><input type="checkbox"/> Understand Chebyshev Equation of first and second kind</li> <li><input type="checkbox"/> Use Bessel's functions to solve Sturm-Liouville Problem</li> </ul>
BSCSM SEC(M)606(B) (same for B.Sc. (NM) and B.A.)	Fourier integral & fourier transforms	<p>Upon completion of this course the students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the concept of Fourier Series.</li> <li>• Student will be able to find Fourier Transform solution of some Partial Differential Equations</li> </ul>

## **Program Name: Master of Science (Mathematics)**

### **PROGRAM OUTCOMES:**

After the successful completion of this course, the student be able

PO 1:To motivate for research in mathematical sciences.

PO 2:To train computational scientists who can work on real life challenging problem.

PO 3:To have an in-depth knowledge of a broad range of methods and techniques for analyzing and solving problems within applicable fields.

PO 4:To have a Good theoretical insight and the ability to apply theory to thdevelopment of methods and techniques for solving a problem.

PO 5:To have an in-depth knowledge within a specific mathematical primary field.

PO 6:To tackle complex problems, reveal structures and clarify problems, discover suitable analytical and/or numerical methods and interpret solutions.

PO 7:To communicate clearly in writing and orally knowledge, ideas and conclusions about mathematics, including formulating complex mathematical arguments, using abstract mathematical thinking synthesizing intuition about mathematical ideas and their applications.

PO 8:To demonstrate an advanced knowledge and fundamental understanding of a number of specialist mathematical topics, including the ability to solve problems related to those topics using appropriate tools and techniques.

### **PROGRAM EDUCATIONAL OBJECTIVES(M. Sc. Mathematics)**

PEO-1: To equip students with knowledge, skills and insight in Mathematics and related fields.

PEO-2: To enable students to work as a mathematical professional, or to employ as a scientific researcher.

PEO-3: To develop the ability to utilize the mathematical problem solving methods such as analysis, modeling, programming and mathematical software applications in addressing the practical issues.

PEO-4: To equip graduates with communication skills, which will allow them to collaborate effectively with other members of a team

PEO 5:To encourage students to recognize the need for and to develop the ability to engage in life-long learning.

### **PROGRAM SPECIFIC OUTCOMES:**

PSO 1:Demonstrate the ability to conduct research independently and pursue higher studies towards the Ph.D. degree in mathematics and computing.

PSO 2: Carry out development work as well as take up challenges in the emerging areas of Industry.

PSO 3: Demonstrate competence in using mathematical and computational skills to model, formulate and solve real life applications.

PSO 4: Acquire deep knowledge of different mathematical and computational disciplines so that they can qualify NET/ GATE examination.

PSO 5: The courses give them in-depth knowledge in theoretical aspects of the subject

**Course Outcome:**

Course Code	Course	Course Outcome
MM 101	LABESGUE THEORY OF INTEGRATION	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the fundamental concepts of Mathematical Analysis.</li> <li>2. State some of the classical theorems in of Advanced Real Analysis.</li> <li>3. Be familiar with measurable sets and functions.</li> <li>4. Integrate a measurable function.</li> <li>5. Understand the concept of Lebesgue Theory of Integration</li> </ol>
MM 102	DIFFERENTIAL EQUATIONS	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the fundamental concepts of differential equations like existence of solution of ODE of first order, initial value problem, Ascoli's Lemma, Gronwall's inequality, Cauchy Peano Existence Theorem, Uniqueness of Solutions.</li> <li>2. Learn and derive the solutions system of differential equations, nth order differential equation, existence and uniqueness theorems for system and higher order equations.</li> <li>3. Learn and find the solution of Sturm's problems and the concept of separation theorem, Sturm's fundamental comparison theorem, Sturm Liouville boundary value problem.</li> <li>4. Be familiar with the concept of characteristic values &amp; characteristic functions, orthogonality of characteristic functions, expansion of a function in a series of orthonormal functions.</li> </ol>
MM 103	MATHEMATICAL STATISTICS	<p>On completion of this unit successful students will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the concept of Probability distributions.</li> <li>2. Find mathematical expectation, moments, moment generating functions, product moments, moments of linear combinations of random variables, conditional expectations.</li> <li>3. Be familiar with study of various discrete distributions.</li> <li>4. Be familiar with study of various continuous distributions.</li> <li>5. Be able apply test of significance.</li> </ol> <p>Be able to find point estimation.</p>
MM 104	ALGEBRA-I	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Understand normal and subnormal series, solvable</li> </ol>

		<p>groups, nilpotent groups and composition series.</p> <ol style="list-style-type: none"> <li>2. Derive Jordan-Holder theorem for groups.</li> <li>3. Understand permutation groups.</li> <li>4. Understand the structure theory of groups.</li> <li>5. Derive fundamental theorem of finitely generated abelian groups, Sylow's theorems.</li> <li>6. Understand groups of order <math>p^2</math>, <math>pq</math>.</li> <li>7. Understand ideals, algebra of ideals, maximal and prime ideals, ideal in quotient rings.</li> <li>8. Learn the concepts of field of quotients of integral domain and rings of endomorphisms of abelian groups and prove the theorems concerning the topic.</li> </ol>
MM 105	OPTIMIZATION TECHNIQUES	<p>On completion of this unit successful students will be able to:</p> <ol style="list-style-type: none"> <li>1. Formulate optimization problems.</li> <li>2. Understand and apply the concept of optimality criteria for various type of optimization problems.</li> <li>3. Solve various constrained and unconstrained problems in single variable as well as multivariable.</li> <li>4. Solve the transportation and assignment problems.</li> <li>5. Apply the methods of optimization in real life situation.</li> <li>6. Identify strategic situations and represent them as games.</li> <li>7. Solve simple games using various techniques.</li> <li>8. Analyze economic situations using game theoretic techniques.</li> <li>9. Recommend and prescribe which strategies to implement.</li> </ol>
MM 106	NUMBER THEORY	<p>On completion of this unit successful students will be able to:</p> <ol style="list-style-type: none"> <li>1. Learn the foundational concepts of number theory.</li> <li>2. Understand the concept of arithmetical functions.</li> <li>3. Learn Dirichlet inverses and Mobius inversion formula, multiplicative functions, dirichlet multiplication.</li> <li>4. Derive the inverse of a completely multiplicative function, generalized convolutions.</li> <li>5. Learn some elementary theorems on the distribution of prime numbers.</li> <li>6. Prove the theorems related to number theory.</li> <li>7. Study and understand groups.</li> </ol>
MM 201	LINEAR ALGEBRA	<p>On completion of this unit successful students will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the concepts of linear transformation, the algebra of linear transformation, isomorphism, representation of transformations by matrices, linear functional, and the transpose of linear transformation.</li> <li>2. Understand characteristic values, annihilating polynomials, invariant subspaces, simultaneous triangulation, simultaneous</li> </ol>

		<p>diagonalization, direct sum decompositions, invariant direct sums, the primary decomposition theorem.</p> <p>3. Learn the Rational and Jordan forms and inner product spaces and their applications.</p>
MM 202	COMPLEX ANALYSIS-I	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Represent complex numbers algebraically and geometrically.</li> <li>2. Define and analyze limits and continuity for complex functions as well as consequences of continuity.</li> <li>3. Apply the concept and consequences of analyticity and the Cauchy-Riemann equations and of results on harmonic and entire functions including the fundamental theorem of algebra.</li> <li>4. Analyze sequences and series of analytic functions and types of convergence.</li> <li>5. Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula.</li> <li>6. Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.</li> </ol>
MM 203	TOPOLOGY-I	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Define and illustrate the concept of topological spaces and continuous functions.</li> <li>2. Define and illustrate the concept of product topology.</li> <li>3. Prove a selection of theorems concerning topological spaces, continuous functions and product topologies.</li> <li>4. Define and illustrate the concepts of the separation axioms.</li> <li>5. Define connectedness and compactness, and prove a selection of related theorems.</li> </ol>
MM 103	DIFFERENTIAL GEOMETRY	<p>On satisfying the requirements of this course students will have the knowledge and skills to</p> <ol style="list-style-type: none"> <li>1. Explain the concepts and language of differential geometry and its role in modern mathematics.</li> <li>2. Analyze and solve complex problems using appropriate techniques from differential geometry.</li> <li>3. Obtain sound knowledge in understanding the basic concepts in geometry of curves and surfaces in Euclidean space, especially.</li> <li>4. Acquire mastery in solving typical problems associated with the theory.</li> <li>5. Gain sufficient knowledge for generalizing these</li> </ol>

		concepts to higher dimensions.
MM 205	NUMERICAL METHODS	<p>On completion of this unit successful students will be able to:</p> <ol style="list-style-type: none"> <li>1. Derive numerical methods for approximating the solution of problems of continuous mathematics.</li> <li>2. Analyze the error incumbent in any such numerical approximation.</li> <li>3. Implement a variety of numerical algorithms using appropriate technology.</li> <li>4. Compare the viability of different approaches to the numerical solution of problems arising in roots of solution of non-linear equations, interpolation and approximation, numerical differentiation and integration, solution of linear systems.</li> </ol>
MM 206	FUZZY SETS & ITS APPLICATIONS	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand fuzzy sets and fuzzy set operations</li> <li>2. Understand fuzzy relation and fuzzy logic</li> <li>3. Find the optimal solution of mathematical programming problems having uncertain and imprecise data.</li> <li>4. Solve fuzzy relation equation.</li> <li>5. Perform fuzzy arithmetic operations.</li> <li>6. Find fuzziness and uncertainty of fuzzy and classical sets</li> <li>7. Handle the real world problem in engineering having uncertain and imprecise data.</li> </ol>
MM 301	TOPOLOGY-II	<p>Upon completion of this course, students should be able to:</p> <ol style="list-style-type: none"> <li>1. Define and illustrate the concepts of the axioms of countability and prove the theorems concerning the topic.</li> <li>2. Understand concept of regularity, normality, complete regularity, complete normality and the theorems concerning those axioms.</li> <li>3. Understand the concept of Nets and Filters, their relation and prove the related theorems.</li> <li>4. Define and understand identification topology, quotient spaces and prove the theorem related to the topic.</li> <li>5. Understand the concept of cones, suspensions, and weak topology and adjunction spaces.</li> <li>6. Prove the theorems related concerning to the topic product of countable regular, <math>T_2</math>, completely regular, normal and tichonov spaces.</li> </ol>

MM 302	FUNCTIONAL ANALYSIS	<p>On completion of this unit successful students will be able to:</p> <ol style="list-style-type: none"> <li>1. Discuss various problems in different space: vector space, inner product space and Hilbert Spaces.</li> <li>2. Explain the fundamental concepts of functional analysis.</li> <li>3. Understand the approximation of continuous functions.</li> <li>4. Understand concepts of Hilbert and Banach spaces with <math>l_2</math> and <math>l_p</math> spaces serving as examples.</li> <li>5. Understand the definitions of linear functional and prove the Hahn-Banach theorem, open mapping theorem, uniform boundedness theorem, etc.</li> <li>6. Define linear operators, self adjoint, isometric and unitary operators on Hilbert spaces.</li> </ol>
MM 303	DIFFERENTIABLE MANIFOLDS	<p>On completion of this unit successful students will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the fundamental concepts of differentiable Manifolds.</li> <li>2. Understand differentiable maps on manifolds, tangent vectors and tangent space, cotangent space, vector fields, Lie-bracket of vector fields, immersions and embeddings.</li> <li>3. Understand tensors and forms, exterior product and Grassman algebra, connections, difference tensor, existence of parallelism and geodesics, covariant derivative, exterior derivative contraction, Lie-derivative.</li> <li>4. Understand torsion tensor and curvature tensor of a connection, properties of torsion and curvature tensor.</li> <li>5. Understand Riemannian manifolds fundamental theorem of Riemannian geometry, Riemannian connection, Riemannian curvature tensor and its properties.</li> </ol>
MM 303	MATHEMATICAL STATISTICS	<p>On completion of this unit successful students will be able to:</p>

		<ol style="list-style-type: none"> <li>1. Understand the concept of Probability distributions.</li> <li>2. Find mathematical expectation, moments, moment generating functions, product moments, moments of linear combinations of random variables, conditional expectations.</li> <li>3. Be familiar with study of various discrete distributions.</li> <li>4. Be familiar with study of various continuous distributions.</li> <li>5. Be able apply test of significance.</li> <li>6. Be able to find point estimation</li> </ol>
MM 305	CLASSICAL MECHANICS	<p>On completion of this unit successful students will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the concept Basic Principles of Mechanics of a Particle and a System of Particles.</li> <li>2. Be able to understand Variational Principles and Lagrange's Equations.</li> <li>3. Understand Conservation Theorems and Symmetry Properties.</li> <li>4. Be familiar with the Two-Body Central Force Problem One Dimensional Problem and the Classification of Orbits, The Virial Theorem, Conditions for Closed Orbits, Bertrand's Theorem.</li> <li>5. Understand the Kepler Problem: Inverse Square Law of Force, The Motion in Time in the Kepler Problem, Kepler's Laws, Kepler's Equation, The Laplace-Runge-Lenz Vector.</li> <li>6. Understand Scattering in a Central Force Field.</li> </ol>
MM 306	FIELD THEORY	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand basic concepts of Fields, Algebraic and transcendental elements, Irreducible polynomials. Gauss Lemma, Eisenstein's criterion.</li> <li>2. Find the Adjunction of roots, Kronecker's theorem, algebraic extensions, algebraically closed fields. Splitting fields, Normal extensions, multiple roots, finite fields, Separable extensions, perfect fields, primitive elements, and Lagrange's theorem on primitive elements.</li> <li>3. Be familiar with automorphism groups and fixed fields, Galois extensions, Fundamental theorem of Galois theory, Fundamental theorem of algebra, Roots of unity and cyclotomic polynomials.</li> <li>4. Understand Cyclic extension, Polynomials solvable by radicals, Symmetric functions, cyclotomic extension, quintic equation and solvability by radical</li> </ol>
MM 401	THEORY OF LINEAR OPERATORS	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand spectrum of linear operators on finite</li> </ol>

		<p>dimensions normed linear spaces.</p> <ol style="list-style-type: none"> <li>2. Understand spectrum of linear operators on any dimensions normed linear spaces.</li> <li>3. Find spectrum of linear operators.</li> <li>4. Understand spectrum and resolvent of Banach Algebra.</li> <li>5. Understand spectrum of compact linear operators.</li> <li>6. Understand spectral properties of bounded self adjoint linear operators on a complex Hilbert spaces.</li> </ol>
MM 402	MATHEMATICAL METHODS	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand linear integral equations of first and second kind, Abel's problem.</li> <li>2. Learn Relation between linear differential equation and Volterra's equation, Non linear and Singular equations.</li> <li>3. Find solution by successive substitutions.</li> <li>4. Understand Volterra's equation, iterated and reciprocal functions, Volterra's solution of Fredholm's equation. Fredholm's equation as limit of finite system of linear equations, Hadamard's theorem, convergence proof, Fredholm's two fundamental relations.</li> <li>5. Find Fredholm's solution of integral equation when <math>D(L) \neq 0</math>.</li> <li>6. Find Fredholm's solution of Dirichlet's problem and Neumann's problem, lemmas on iterations of symmetric kernel.</li> <li>7. Solve simple variational problems, necessary condition for an extremum, Euler's equation.</li> <li>8. Solve end point problem, variational derivative, Invariance of Euler's equation.</li> <li>9. Solve fixed end point problem for n-unknown functions, Variational problem in parametric form, functionals depending on higher order derivatives.</li> </ol>
MM 403	DIFFERENTIAL GEOMETRY OF MANIFOLDS	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand topological groups, Lie groups and lie algebras,</li> <li>2. Understand homomorphism and isomorphism, Lie transformation groups, general linear groups.</li> <li>3. Learn the concept of Principal fibre bundle, linear frame bundle, associated fibre bundle, Vector bundle, Tangent bundle, Induced bundle, Bundle homomorphism.</li> <li>4. Learn the concept of normals, Gauss formulae, Weingarten equations, Lines of curvature, Generalized Gauss and Mainardi-Codazzi equations.</li> <li>5. Learn the concept of Nijenhuis tensor, Contravariant and covariant almost analytic vector fields, F-connection.</li> </ol>
MM 404	FLUID MECHANICS	<p>After the completion of this course the student will be able to:</p>

		<ol style="list-style-type: none"> <li>1. Understand equations of fluid mechanics, Bernoulli's theorem steady irrotational non-viscous compressible flow.</li> <li>2. Solve three dimensional sources and dipoles, spherical obstacle in a uniform stream Moving sphere, images.</li> <li>3. Understand the application of complex variable method, two dimensional dipole, superposition, Joukowski's transformation. Milne Thomson circle theorem, Blasius theorem, drag and lift.</li> <li>4. Be familiar with the concept of Source and vortex filaments.</li> <li>5. Understand Diffusion of vorticity in an incompressible fluid steady flow through a straight circular pipe.</li> </ol>
MM 405	ALGEBRAIC CODING THEORY	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the concept of Maximum-Likelihood Decoding and Syndrome Decoding.</li> <li>2. Analyze Double Error-Correcting B.C.H. code and Finite Fields Polynomials.</li> <li>3. Understand Cyclic Codes.</li> <li>4. Apply Quadratic Residue (Q.R.) Codes and find its applications.</li> <li>5. Study the concept of Bose-Chaudhuri-Hocquenghem (B.C.H.) Codes and Weight distributions.</li> </ol>
MM 406	OPERATIONS RESEARCH	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand and develop Poisson Queueing models.</li> <li>2. Understand deterministic and stochastic Inventory models.</li> <li>3. Understand the concept of Replacement and maintenance.</li> <li>4. Draw network, find Minimal Spanning Tree.</li> <li>5. Do optimal scheduling by CPM and Project Evaluation and Review Techniques (PERT).</li> </ol>
MM 407	NON LINEAR PROGRAMMING	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Learn the basic concepts of non-linear programming and solve problems of minima and maxima of convex and concave functions.</li> <li>2. Solve programming problems with inequality constraints.</li> <li>3. Solve quadratic programming problems and learn various methods.</li> <li>4. Understand and solve linear and non-linear fractional problems.</li> </ol>
MM 408	ADVANCED NUMERICAL ANALYSIS	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Understand concepts of Ordinary Differential Equations and solve problems.</li> </ol>

		<ol style="list-style-type: none"> <li>2. Understand and solve parabolic Equation.</li> <li>3. Solve Elliptic Equation, Finite difference replacement and reduction to block tridiagonal form and its solution.</li> <li>4. Find Solution by Gauss-Seidel, Gaussian elimination and SOR Method, treatment of curved boundaries.</li> <li>5. Find solution by alternate direction implicit method.</li> <li>6. Solve hyperbolic equations.</li> <li>7. Understand and use approximate methods.</li> </ol>
MM 409	COMPLEX ANALYSIS-II	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Manipulate complex numbers in various representations, define fundamental topological concepts in the context of the complex plane, and define and calculate limits and derivatives of functions of a complex variable.</li> <li>2. Use Cauchy's Theorem and Cauchy's Integral Formula, the Fundamental Theorem of Algebra, Morera's Theorem and Liouville's Theorem.</li> <li>3. Represent analytic functions as power series on their domains and verify that they are well-defined.</li> <li>4. Define a branch of the complex logarithm. Classify singularities and find Laurent series for meromorphic functions</li> </ol>
MM 410	ALGEBRIC TOPLOGY	<p>After the completion of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. To be familiar with the Fundamental group, Topological invariance, covering spaces, The Fundamental group of the circle. Retractions and fixed points and the Fundamental theorem of Algebra,</li> <li>2. To understand direct sums of abelian groups, Free products of groups, their generators and relations, The Seifert-Van Kampen theorem and the Fundamental group of a wedge of circles.</li> <li>3. To be able to do Classification of covering spaces.</li> </ol>

## **Program Specific Outcomes and Course Outcomes**

**Program Name: M. Sc. (Hons.) Microbiology**

**Program Code:-MSMB**

The program aims are

**PEO1.**The students will have in-dept knowledge about various microbiology concepts and functional area so microbiology with special reference to medical, industrial and environmental microbiology.

**PEO2.**The students will have both the theoretical and practical knowledge in different fields of microbiology with major emphasis on the practical aspects of the field.

**PEO3.**Students will learn to plan and perform experiments, analyze the data and able to present the results the both qualitatively and quantitatively.

**PEO4.**Exposure to practical knowledge will enhance their intellectual development and academic progression which enable the student to pursue a career of his/her choice

### **Program Outcomes (PO) For Post Graduate Program (PG)**

**Program Name: -M.Sc. (HONOURS) IN MICROBIOLOGY**

**ProgramCode:-MSMB**

After completing Postgraduate program in microbiology, a student will be

**PO1.** Able to understand and explain the basic branches of Microbiology such as Bacteriology, Virology, Mycology and Phycology.

**PO2.**Able to elucidate the various applications of Microbiology in different fields such as environment, food, agriculture, Medical and Diagnostic, Industry etc.

**PO3.**Gain the knowledge in other diverse fields and allied like immunology, molecular biology, genetic engineering, bioinformatics and biostatistics.

**PO4.** Familiar with in basic as well as the most recent advances in microbiology, and will have

hands-on experience in microbiological techniques, including fermentation and molecular biology techniques.

**PO5.**After Gaining the knowledge students will be able to design and execute experiments and research project related to basic microbiology, immunology, molecular biology and recombinant DNA technology.

**PO 6.** Skilled with values of professional ethics through IPR and total quality magement be geared up to contribute to society as responsible individuals.

### Program Specific Outcomes (PSO)

## Program Name:-M.Sc.(HONOURS) MICROBIOLGY

Program Code:-MSMB

**PSO1.**To equip the students with requisite conceptual knowledge, necessary skills and positive attitude required for be coming successful researcher and industrial requirement for a microbiologist.

**PSO2.**To develop effective communication and presentations skills requiredfor a microbiologist.

**PSO3.**To prepare the students toaware about the properties of different microorganisms and their applications.

**PSO4.**To developpractical skills to use these microorganisms in different techniques for different activities (Biosensor, production of different product, bioremediation).

**PSO5.**To develop the research qualities to flourish their career in research fieldsand which leads to environmental benefits.

### Course Outcome:

Course Code	Course	Course Outcome
<b>M. Sc. Microbiology I<sup>st</sup> year</b>		
MMB-101	General Microbiology	1. The student will have the insight knowledge of microbes and their diversity. 2. They will be able to describe the different morphological characters, nutrition types, growth pattern and control of microorganism.

		<p>3. Students will also learn about the microscope along with its use in field of microbiology.</p> <p>4. Students will also be able to describe the role of microorganisms in different fields.</p>
MMB-102	Bacteriology and Virology	<p>1. The student will have the deep knowledge of bacteria and virus.</p> <p>2. They will be able to describe the morphological features and structural components and classification of bacteria and viruses.</p> <p>3. They will gain knowledge about the bacterial cell wall and able to differentiate between Gram +ve and Gram –ve bacteria.</p> <p>4. Students will also learn about the symptoms and transmission of various diseases caused plant and animal viruses.</p>
MMB-103	Fundamentals of biochemistry	<p>1. Students will have fundamental knowledge of the biomolecules along with their importance and structural and functional organization.</p> <p>2. Students are also become able to use the advance properties of these molecules in the productions.</p> <p>3. They will learn the central metabolic pathways for carbohydrate metabolism and their regulation.</p> <p>4. Students will also gain knowledge about the enzymes, its kinetics and regulation</p>
MMB-104	Instrumentation and biotechniques	<p>1. Students will technically strong to operate the different instruments like spectrophotometer, microscope, TLC, GC, HPLC, autoclave, centrifuge and gel electrophoresis.</p> <p>2. They will have the advance knowledge of the principle and working of these instruments.</p>
MMB-105	Research methodology	<p>1. The student will have the detailed knowledge about research problems, their types and their solutions as well.</p> <p>2. They will learn about the sampling types and techniques.</p> <p>3. Students will gain insight knowledge regarding the thesis writing and paper publishing.</p>
MMB-201	Immunology	<p>1. Students will be able to understand the fundamental bases of immune system and immune response</p> <p>2. They will also be able to gather knowledge about the structure, function and organization of various cells, organs and components of the immune system.</p> <p>3. Students will be able to compare and contrast the humoral and cell-mediated immune responses and also able to review the role of cytokines in immunity.</p> <p>4. Students will also be able to understand the concept of immunization and vaccines.</p> <p>5. Students will also gain knowledge of different immune assays for the quantification of immune response.</p>

MMB-202	Food & Industrial Microbiology	<ol style="list-style-type: none"> <li>1. Student will gained insight on industrially important microbes and their applications in production of various fermented products.</li> <li>2. Also attains the knowledge about industrial strains and various media optimization and formulation strategies at fermenter level.</li> <li>3. They will also become aware of various food laws and regulations along with their implementations.</li> <li>4. Students would also gather knowledge regarding microbes causing food intoxications and food-borne infections.</li> </ol>
MMB-203	Mycology & Phycology	<ol style="list-style-type: none"> <li>1. Students will be able to differentiate between fungi and algae on the basis of their characteristics and features.</li> <li>2. Students will also attain knowledge about the classification, reproduction and applications of fungi and algae.</li> <li>3. Students will gain insight knowledge regarding the mushroom production and value-added products.</li> </ol>
MMB-204	Computer & Bioinformatics	<ol style="list-style-type: none"> <li>1. Student will be able to utilize the applications of computer in biological sciences.</li> <li>2. They will be able to access and retrieve information from various primary and secondary databases.</li> <li>3. They will able to analyze and align the sequence by using different bioinformatics techniques.</li> </ol>
	Cell Biology	<ol style="list-style-type: none"> <li>1. Student will able to distinguish between prokaryotic and eukaryotic cells.</li> <li>2. They have deep knowledge of the structure and cell components of these cells.</li> <li>3. Students will gain deep insight on cell cycle, cell-cell interaction and cell –signaling process.</li> </ol>
MMB-205	Microbial Biotechnology	<ol style="list-style-type: none"> <li>1. Students will learn about the role of microbial technology in different fields.</li> <li>2. Understand the concept of recombinant biomolecules, therapeutic proteins, vaccines, bio-pesticides, bio-fertilizers etc.</li> <li>3. Students will learn about the recombinant heterologous expression systems such as bacteria and yeast.</li> <li>4. Students will also gain knowledge regarding the role of microbes in managing the environmental contaminants.</li> </ol>
	Plant Tissue Culture	<ol style="list-style-type: none"> <li>1. Students will learn different techniques for the in-vitro propagation of plants.</li> <li>2. They will also gain information regarding the various methods for the genetic transformation.</li> </ol>
<b>M. Sc. Microbiology II<sup>nd</sup> year</b>		
MMB-301	Microbial Genetics & Genetic Engineering	<ol style="list-style-type: none"> <li>1. Students will gain immense knowledge about central dogma of life. They will able to differentiate between</li> </ol>

		<p>DNA and RNA at their structural level.</p> <p>2. Students will be able to describe the process of replication, transcription and translation.</p> <p>3. They will be able to explain various levels of gene regulation in both prokaryotic and eukaryotic organisms.</p> <p>4. Students will also be able to elucidate concept of DNA repair mechanisms and recombination as a molecular biology tool.</p> <p>5. Students will learn about the properties and types of plasmids.</p>
MMB-302	Medical Microbiology	<p>1. Students will learn about different classical and molecular determinants of disease causing microbes.</p> <p>2. Students will gain knowledge about transmission and diseases caused by different pathogenic bacteria and viruses.</p> <p>3. They will also come across various terms used in medical microbiology.</p> <p>4. They will be able to understand different the mechanisms underlying resistance to bacteria against antibiotics.</p> <p>5. Students will also gain practical knowledge regarding the susceptibility and resistance among pathogenic microbes towards antibiotics.</p>
MMB-303	Biostatistics	<p>1. Students will learn the application of statistics in biological field.</p> <p>2. Students will able to analyze the different statistical data and summarize it with different techniques</p>
MMB-304	Microbial Quality Control in Food and Pharmaceutical	<p>1. Students will have the skilled knowledge of laboratory practices and will be able to do quality testing of microbes in food and pharmaceutical industries.</p> <p>2. Students will gain knowledge regarding the specific media used for the detection of pathogenic microbes.</p> <p>3. They will also able to identify the pathogenic level of the microbes.</p>
	Diagnostic Microbiology	<p>1. Students will learn about the collection, processing and analysis of clinical samples.</p> <p>2. Students will also gain insight knowledge for the serological and molecular detection of clinical samples.</p>
MMB-305	Biofertilizers and Biopesticides	<p>1. Students will gain adequate knowledge of organic farming and also learn the importance of microbes in agriculture.</p> <p>2. Students will gain deep knowledge on exploration of microbial strains as bio-pesticides, bio-fertilizer and PGPR.</p>
	Food Fermentation Techniques	<p>1. Students will get comprehensive information of food fermentation and probiotic foods along with their benefits.</p> <p>2. Students will attain the satisfactory knowledge of</p>

		microbes involved and fermentation techniques to produce fermented foods.
MMB-401	Environmental Microbiology	<ol style="list-style-type: none"> <li>1. Students will gain knowledge regarding the environment and its components and interactions among these.</li> <li>2. Students will be able to describe the role of microbes in solid and liquid waste management by gaining the knowledge of various methods used for sewage and solid waste treatment.</li> <li>3. Students will also understand the role of microbes in bioremediation of environmental pollutants like petroleum hydrocarbons, pesticides, heavy metals and also understand utility of microbes in mineral and oil recovery.</li> </ol>
MMB-402	Soil & Agriculture Microbiology	<ol style="list-style-type: none"> <li>1. Students will learn about the soil characteristics and soil ecosystem. They will also learn how soil act as habitat for the growth of microbes.</li> <li>2. Students will understand the interactions of microbes with plants and their role in plant productivity.</li> <li>3. Students will gain insight knowledge on exploration of microbes as biofertilizers and bio-control agents.</li> <li>4. Students will also extend their knowledge of use of genetically modified organisms in agriculture.</li> </ol>
MMB-403	TQM and IPR	<ol style="list-style-type: none"> <li>1. Students will learn about intellectual property rights with major emphasis on patents, patentability criteria and patent filing at national and international level.</li> <li>2. Students will also gain extensive knowledge on bio-safety, bioethics, GLP, GMP standards and ISO certification.</li> <li>3. Students will be able to understand the various concepts of total quality management and it will facilitate them to establish business.</li> </ol>
MMB-404	Fermentation Technology	<ol style="list-style-type: none"> <li>1. Students will understand the concept of strain improvement and screening of these for industrial applications.</li> <li>2. They will learn about the design, types of and components of bioreactors and also understand the concept of sterilization, aeration and agitation.</li> <li>3. Student will learn the production and recovery process of various industrially important products.</li> </ol>
	Recombinant DNA Technology	<ol style="list-style-type: none"> <li>1. Students will be familiar with the use of various cloning vectors, restriction enzymes and various cloning methods.</li> <li>2. Students will be able to describe the various applications of PCR, RFLP, AFLP and RAPD in recombinant DNA technology.</li> <li>3. Students will also be able to apply their knowledge of genetic engineering in various fields.</li> </ol>
MMB-405	Microbial Analysis of Air and Water	<ol style="list-style-type: none"> <li>1. Students will get expertise to isolate and identify the various microorganisms present in air and water</li> </ol>

		samples. 2. They will also gain knowledge of measures to analyze and control them.
	Management of Human Microbial Diseases	1. Students will get extensive information of various microbes causing diseases in humans. 2. Students will have knowledge of various therapeutics, vaccines and preventive measures to control these.

## **The Program Specific Outcomes and Course Outcomes of all the Programmes**

**Program Name: B.Sc. (Hons.) Biotechnology**

**Program Educational Objectives (PEO)**

**Program Code :- BSHBT**

**The program aims are**

**PEO -I:** Our graduates will contribute to the field of biotechnology and allied industries designing, developing and providing solutions for product/processes/technology development.

**PEO-II:** Work as entrepreneurs and techno managers with strong ethics and communication skills.

**PEO-III:** Pursue higher education and research in reputed institutes at national and international level.

**PEO-IV:** Apply the acquired practical skills and broad biotechnological training in product, process and techniques development to meet the societal demands.

**PEO-V:** To promote student awareness of the life-long learning and to introduce them to professional ethics and codes of professional practice.

**Program Outcomes (PO) For Under Graduate**

**Program Program Name: - BSc (Hons)**

**Biotechnology**

**Program Code :- BSHBT**

After successful completion of this B.Sc programme in Biotechnology, students will acquire:

**PO-I:** An ability to design and conduct experiments, as well as to analyze and interpret

data

**PO -II.** An ability to apply knowledge of tools of biotechnology in the welfare of society.

**PO-III.** A knowledge of contemporary issues and being inquisitive in understanding cutting edge areas of Biotechnology

**PO- IV.** Trained enough to take employment in diverse areas of biotechnology as well as for further higher studies.

**PO-V:** Students will be eligible for doing jobs in various sectors of pharmaceutical and biotechnological industry.

### Program Specific Outcomes (PSO)

**Program Name: - BSc**

**(Hons)Biotechnology**

**Program Code :- BSHBT**

**PSO:I** Acquire knowledge on the fundamentals of biotechnology for sound and solid base which enables them to understand the emerging and advanced concepts in life sciences.

**PSO:II:** To introduce the structural and functional concepts underlying the cellular biochemistry and to understand the detailed overview of eukaryotic cell and its inner components ,the processes of cell transport and cell locomotion.

**PSO-III:.** Molecular Biology & Genetics in Course will enhance the knowledge base about functional and structural organization of nucleic acid. The course particularly aims at understanding structure, synthesis and replication of nucleic acids. After completing the course on genetics complete knowledge as how genes are transmitted in plants and animals from one generation to another will be imparted. Along with this, the course will highlight the role of genetics / mutations in animal and plant breeding.

**PSO-IV:** Recognize the importance of fermentation and to make the students conversant with raw materials, types and factors affecting fermentation. To make the students aware about growth kinetics of microbes and production of primary and secondary metabolites

**PSO-V:** At the end of this course students would be able to understand the principle, working, maintain and calibrations of bio analytical tools .Specifically students will be able to learn underlying principle of techniques such as electrophoresis, microscopy, spectroscopy

### Semester -I

Coursecode	Course	Learning Outcomes
BSHBT (C1-101)	Biochemistry and Metabolism	After completion of the course the students will be able to: <ul style="list-style-type: none"> <li>● comprehend structure and function of different biomolecules including proteins, lipids, vitamins, and carbohydrates.</li> <li>● acquire knowledge of various metabolic pathways occurring inside living cells.</li> <li>● role of hormones in regulating metabolic processes</li> </ul>
BSHBT (C2-102)	Cell Biology	By the end of course student will be able to <ul style="list-style-type: none"> <li>● an overview of basic cell biology includes structure of cell and cell organelles</li> <li>● dynamic attributes of cell division cell cycle, cell differentiation and cellular signaling.</li> <li>● also learn concepts of cell senescence, cell death and cancer cell</li> </ul>

### Semester – II

Coursecode	Course	Learning Outcomes
BSHBT (C3-201)	Plant Physiology	Students will be able to understand <ul style="list-style-type: none"> <li>● structural organization of plant.</li> <li>● learn as to how plants grow, respire and reproduce.</li> <li>● How plants tolerate adverse conditions.</li> </ul>
BSHBT (C4-202)	General Microbiology	Students will be able to understand <ul style="list-style-type: none"> <li>● microbial taxonomy, diversity and its nutrition</li> <li>● concept of sterilisation techniques and various culturing</li> </ul>

		<p>techniques and its growth kinetics</p> <ul style="list-style-type: none"> <li>● role of microorganisms environment, including elemental cycles and biodegradation.</li> </ul>
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### Semester - III

Coursecode	Course	Learning Outcomes
BSHBT(C5-301)	Genetics	<p>On completion of this course, students will be able to have</p> <ul style="list-style-type: none"> <li>● knowledge and skills to explain the key concepts in population, evolutionary and quantitative genetics. □</li> <li>● how genes are transferred from generation to generation. □</li> <li>● how alteration in genes results in various genetic disorders.</li> </ul>
BSHBT (C6-302)	Fundamentals of Fermentation	<p>By the end of the course the student will learn to:</p> <ul style="list-style-type: none"> <li>● role of various media components in fermentation.</li> <li>● to understand various types of fermentation process and factors affecting fermentation.</li> </ul>
BSHBT (C7-303)	Plant Biotechnology	<p>By the end of the course the student will be able to :</p> <ul style="list-style-type: none"> <li>● understand principles of sterilisation methods including</li> <li>● different in vitro culture techniques □</li> <li>● provide detail pertaining to tools and processes involved in generation of transgenic plants.</li> </ul>
BSHBT(SEC1-304)	Industrial Fermentation	<p>Students will learn about</p> <ul style="list-style-type: none"> <li>● production process for various industrial fermentation products like primary and secondary metabolites, biofuels, biofertilizers, biopesticides.</li> <li>● microbial transformations, their applications in industries, microbial leaching for metal recovery.</li> </ul>

### Semester – IV

Coursecode	Course	Learning Outcomes
BSHBT (C8-401)	Molecular Biology	<p>Course on Molecular Biology will enrich knowledge base with</p> <ul style="list-style-type: none"> <li>● study of structure and function of living system at molecular level</li> <li>● able to understand significant discoveries and theories and also learn molecular mechanisms by which DNA controls development, growth or morphological characteristics of microorganisms. □</li> <li>● The course particularly aims at understanding structure , synthesis and replication of nucleic acids.</li> </ul>
BSHBT (C9-402)	Immunology	<ul style="list-style-type: none"> <li>● At the end of the course, students will be able to understand</li> <li>● the strengths and weaknesses of our immune (defense) system.</li> <li>● The course will provide sound knowledge of how immune system deals with various pathogens, different processes and cell types involved in prevention of disease along with the concept and significance of vaccines.</li> </ul>
BSHBT (C10-403)	Biophysics	<p>Students will learn about</p> <ul style="list-style-type: none"> <li>● Use of physical and chemical aspects in biological systems by exploring thermodynamics, chemical kinetics, quantum mechanics, optical and hydrodynamic techniques.</li> <li>● also learn about importance of bioenergetics in living systems</li> <li>● various spectroscopic techniques and their applications in research and industry.</li> </ul>
BSHBT (SEC-2-404)	Enzymology	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● understand the structural and functional aspect of enzymes</li> <li>● characterize properties of enzymes kinetics and their</li> </ul>

		parameters <ul style="list-style-type: none"> <li>● microbial selection enzyme production and purification strategies and apply the functional aspect of enzymes in different areas of interest</li> </ul>
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### Semester V

Coursecode	Course	Learning Outcomes
BSHBT (C11-501)	Bioprocess Technology	Students will be able to: <ul style="list-style-type: none"> <li>● understand the concept of upstream and downstream processing, and different unit operations of bioprocesses</li> <li>● apply the different techniques for the recovery/purification of bioproducts</li> <li>● understand the different concept involved in scale up and economics involved in bioprocess</li> </ul>
BSHBT (C12- 502)	Recombinant DNA Technology	Students will gain <ul style="list-style-type: none"> <li>● understanding of various molecular tools</li> <li>● also gain concept of transformants, its screening methods</li> <li>● Its applications in plants and animals.</li> </ul>
BSHBT (DSE 1-503)	Bioinformatics	By the end of course students will learn <ul style="list-style-type: none"> <li>● various tools and techniques of bioinformatics can be utilized in studies pertaining to macromolecules (DNA, RNA, protein). □</li> <li>● after completing this course students will be able to analyze, interpret and study biological data (sequence, structure, etc) stored in various databases available on internet.</li> </ul>
BSHBT (DSE 2 -504)	Animal Biotechnology	Students will learn about

		<ul style="list-style-type: none"> <li>● animal cell culture techniques</li> <li>● gene transfer methods for production of transgenic animals.</li> <li>● also learn large scale culturing of animal cell lines</li> </ul>
	Medical Microbiology	<p>By the end of course student will understand</p> <ul style="list-style-type: none"> <li>● basic principles and then applies clinical relevance in four segments of the academic preparation for physicians: immunology, bacteriology, mycology, and virology.</li> </ul>
	Biostatistics	<p>By the end of course student will understand</p> <ul style="list-style-type: none"> <li>● utilization of mathematical basics and foundation statistics are mandatory for analysis and interpretation of result of experiments and research work. □</li> <li>● able to characterize data and understand different sampling methods. □</li> <li>● concept of probability, correlation and regression.</li> </ul>
	Ecology and Environment Management	<p>Students will be able to understand</p> <ul style="list-style-type: none"> <li>● ecological components of ecosystem and various restoration methods for environment management.</li> <li>● an exposure to ecological perspective of the environmental challenges, opportunities, ecological management of the natural environment.</li> <li>● Insight into the management of interaction of human with the environment. □ An insight into how biotechnology can be utilized for protection of environment.</li> </ul>

### Semester – VI

Coursecode	Course	Learning Outcomes
BSHBT (C13-601)	Bio analytical tools	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>● apply the concepts of bioanalytical techniques in biotechnology research</li> <li>● handle bioanalytical techniques in industry</li> <li>● Operate and optimize the experimental conditions of different analytic techniques</li> </ul>
BSHBT (C14-602)	Genomics and Proteomics	<p>After completion of this course student will be able to</p> <ul style="list-style-type: none"> <li>● understand structural and organization of genomics and proteomics. □</li> <li>● able to learn how their study can be utilized in the field of agriculture, ecotoxicology, human health, etc</li> </ul>
BSHBT (DSE 3-603)	Environmental Biotechnology	<p>Students will learn about</p> <ul style="list-style-type: none"> <li>● various sources of pollution, methods of measurement and treatment technologies like activated sludge, use of aerobic and anaerobic reactors</li> <li>● also learn about the role of biosensors, bioremediation process and bioleaching in restoration of environment.</li> </ul>
BSHBT (DSE 4-604)	Microbial Physiology	<p>The student has fundamental understanding of:</p> <ul style="list-style-type: none"> <li>● Cellular composition, membrane transport, energy generation, diversity of metabolic processes, growth and cell death, and techniques</li> </ul>

		<p>used to elucidate physiological processes. □</p> <ul style="list-style-type: none"> <li>● Integrating primary scientific literature of microbiology to further the understanding of microbial physiology.</li> <li>● Develop scientific writing skills and critical thinking about scientific research.</li> </ul>
	<p>Biochemical Engineering</p>	<p>Course will make the student understand:</p> <ul style="list-style-type: none"> <li>● role of a bioprocess engineer in chemical, pharmaceutical and distillation industry. □</li> <li>● integrated bioprocess, design reactors, maintain contamination free environment in bioprocesses.</li> <li>● To develop concepts to scale-up bioprocesses for industry as well as research organizations.</li> </ul>
	<p>Food Biotechnology</p>	<p>By the end of course student will be able to</p> <ul style="list-style-type: none"> <li>● understand concepts of fermented products.</li> <li>● learn about various value added products</li> <li>● role of biotechnology in improvement of food products</li> </ul>

## **The Program Specific Outcomes and Course Outcomes of**

**Program Name: M.Sc (Hons.) Biotechnology**

**Programme Code (MSBT)**

**(Session 2018-2019)**

**Program Educational Objectives (PEO)**

### **Program Code :- MSBT**

**The program aims are**

**PEO -I:** The programme is aimed towards the scientific research with focus on cell and molecular biology, biochemistry, microbiology, immunology and modern bioengineering subjects.

**PEO-II:** The programme focuses on basic understanding in the diverse fields of traditional and modern biotechnology with emphasis on industrial applications and product developments.

**PEO-III:** It also gives emphasis on skill development in various fields of biotechnology in addition to research training which make students to plan, design, execute, analyze, and solve industrial and research associated problems.

**PEO-IV:** The objective of this programme is to make students competitive enough to make successful career in industries and research institutes/universities.

**PEO-V:** To impart analytical and research skills and nurture entrepreneurial endeavours.

**. Program Outcomes (PO) Post Graduate Program**

**(PG) Program Name: - MSc (Hons)Biotechnology**

### **Program Code :- MSBT**

After successful completion of this M.Sc programme in Biotechnology, students will :

**PO-I:** comprehend and integrate theoretical and practical skills in basic and applied

disciplines of biotechnology.

**PO -II.** acquire knowledge to develop a research plan in which research question, hypothesis, experimental set-up and data analysis are described in relation to relevant literature.

**PO-III.** able to design new biotechnological products or processes by applying knowledge of different disciplines of biotechnology in an integrated manner.

**PO- IV.** trained enough to take employment in diverse areas of biotechnology as well as for further higher studies.

**PO-V:** competent biotechnologist's who can employ and implement their knowledge base in processes and applications which will profoundly influence or utilized for existing paradigm of agriculture, industry, healthcare and restoration of degraded environment to provide sustainable competitive edge to present society. Students will be eligible for doing jobs in various sectors of pharmaceutical and biotechnological industry.

#### Program Specific Outcomes (PSO)

**Program Name: - MSc  
(Hons)Biotechnology  
Program Code :- MSBT**

**PSO:I** Students will be able to design, conduct experiments, analyze and interpret data for investigating problems in Biotechnology and allied fields.

**PSO:II:** Higher studies (M.Phil, Ph.D) can be pursued in order to attain research positions. Various examinations such as CSIR-NET, ARS-NET GATE, ICMR, DBT and many other opens channels for promising career in research.

**PSO-III:** Students can become Production Officer and Technical Assistant in biotechnology, pharmaceutical Companies, bio fertilizer industry, aquaculture industries, environmental units, crop production units, food processing industries and national bio-resource development firms. Entrepreneurship ventures such as consultancy and training centres can be opened.

**PSO-IV:** Some of the major pharmaceutical and drug companies' highering biotechnological professionals include Dabur, Ranbaxy, Hindustan Lever and Dr Reddy's

Labs, food processing industries, chemical industry and textile industry as well.

**PSO-V:** Beside this industries also employ bio-technological professionals in their marketing divisions to boost up business in sectors where their products would be required. Beside industrial sector there are ample opportunities in academics as well. Students will be able to understand the potentials, and impact of biotechnological innovations on environment and their implementation for finding sustainable solution to issues pertaining to environment, health sector, agriculture, etc. Several career opportunities are a, Specific knowledge will be imparted about role of cell division and its regulation on diseases like cancer.

**PSO-VI:** At the end of this course students would be able to understand the principle, working, maintain and calibrations of bioanalytical tools and techniques for industrial and research purpose. Specifically students will be able to learn underlying principle of techniques such as electrophoresis, microscopy, spectroscopy, centrifugation and chromatography.

**Course Outcome:**

<b>Couse Code</b>	<b>Name of paper</b>	<b>Course Learning Outcome</b>
<b>Semester-1</b>		
<b>MSBT(C1)-101</b>	<b>Biochemistry</b>	Students will be able to : a) comprehend the structure and function of different biomolecules including proteins, lipids, nucleic acids, and carbohydrates. b) acquire knowledge for metabolic pathways occurring inside living cells.
<b>MSBT(C2)-102</b>	<b>Microbiology</b>	Students will be able to: : a) Identify major categories of microorganisms and analyze their classification, diversity, and ubiquity. b) Identify and demonstrate structural, physiological, genetic similarities and differences of major categories of microorganisms. c) Identify and demonstrate how to control

		<p>microbial growth.</p> <p>d) Demonstrate and evaluate interactions between microbes, hosts an environment</p>
<b>MSBT(C3)-103</b>	<b>Molecular Genetics</b>	<p>Students will be able to :</p> <p>a) Understand the biological processes through the investigation of the underlying molecular mechanisms.</p> <p>b) Understand various life processes involved in DNA technology in living organisms.</p> <p>understand comparative genomics and its applications</p>
<b>MSBT(E1)-104</b>	<b>Technical Writing And Communication Skills</b>	<p>Students will be able to :</p> <ol style="list-style-type: none"> <li>1. boost the fundamental concept of technical writing practices to raise their writing attempt strategies</li> <li>2. write effectively the synopsis, thesis compilation and training reports.</li> </ol>
<b>MSBT(EII)-105</b>	<b>Opt.I Environmental Biotechnology</b>	<p>Students will be able to :</p> <ol style="list-style-type: none"> <li>a) learn about bioremediation, its mechanism and various aerobic -anaerobic treatment technologies by using reactors for waste treatment.</li> <li>b) explore about biosensors which are used in detection of various pollutants and its applications in different fields.</li> <li>c) Learn about bioleaching and bioenergy production from waste.</li> <li>d) develop analytical skills for water quality parameters, application of bioremediation technologies for effluent treatment</li> </ol>
<b>MSBT(EII)-105</b>	<b>Opt II Cellular organization</b>	<p>Students will be able to:</p> <ol style="list-style-type: none"> <li>1. learn the structure and functions of cells and cell organelles.</li> <li>2. explain the different cell process like, cell differentiation and cell death</li> </ol>

**Semester – II**

<b>MSBT(C4)-201</b>	<b>Bioanalytical techniques</b>	<p>Students will be able to:</p> <ol style="list-style-type: none"> <li>1. apply the concepts of bioanalytical techniques in biotechnology research</li> <li>2. handle these bioanalytical techniques in industry</li> <li>3. Operate and optimize the experimental conditions of different analytic techniques</li> </ol>
<b>MSBT(C5)-202</b>	<b>Immunology &amp; Immunotechnology</b>	<p>At the end of the course, the students should be able to:</p> <ol style="list-style-type: none"> <li>a) compare and contrast the humoral versus cell-mediated immune responses.</li> <li>b) critically review the role of cytokines in immunity and immune cell activation and be able to identify and characterize cytokines of particular immune importance.</li> <li>c) clearly state the role of the immune system against different pathogens.</li> <li>d) be able to distinguish various cell types involved in immune responses and associated functions.</li> <li>e) gain knowledge about immunologic processes governing graft rejection and therapeutic modalities for immune suppression in transplantation</li> </ol>
<b>MSBT(C6)-203</b>	<b>Food Bio-technology</b>	<p>Students will be able to</p> <ol style="list-style-type: none"> <li>a) acquaint with fundamentals of food preservation, food poisoning and food fermentative products.</li> <li>b) <b>Capable for</b> microbiological production of foods and vitamins.</li> </ol>
<b>MSBT(E3)-204</b>	<b>OptI Biostatistics</b>	<p>Students will be able to :</p> <ol style="list-style-type: none"> <li>a) acquainted with various techniques used in summarization and analysis of uni-variate data.</li> <li>b) handling of variable and attribute data to study their characteristics &amp; association, regression analysis and hypotheses testing .</li> </ol>

		c) many statistical analyses
<b>MSBT(E3)-204</b>	<b>OptII Biophysics</b>	<p>Students will be able to :</p> <ol style="list-style-type: none"> <li>1. explore the biological systems like thermodynamics, bioenergetics, chemical kinetics, electrode potential and quantum mechanics.</li> <li>2. apply and analyze the instrumental techniques like spectroscopy, diffraction, optical and various hydrodynamic techniques in the field of biotechnology</li> </ol>
<b>MSBT(E4)-205</b>	<b>OptI Biosafety and Bioethics</b>	<p>Students will be able to:</p> <ol style="list-style-type: none"> <li>a) explain the concept of biosafety and risk assessment of products derived from recombinant DNA research</li> <li>b) understand the effect of environment release of genetically modified organisms, national and international regulations.</li> <li>c) Learn the ethical aspects related to biological, biomedical, health care and biotechnology research</li> </ol>
<b>MSBT(E4)-205</b>	<b>Opt II System biology</b>	<p>Students will be able to:</p> <ol style="list-style-type: none"> <li>a) explain the different biological systems of human being.</li> <li>b) acquaint with the functions of various organs and their regulation.</li> </ol>
<b>Semester – III</b>		
<b>MSBT(C7)-301</b>	<b>Enzymology &amp; Enzyme Technology</b>	<p>Students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the structural and functional aspect of enzymes.</li> <li>2. characterize properties of enzymes kinetics and their parameters</li> <li>3. microbial selection enzyme production and purification strategies</li> <li>4. apply the functional aspect of enzymes in different areas of interest</li> </ol>
<b>MSBT(C8)-302</b>	<b>Genetic Engineering</b>	Students will be able to :

		<p>c) acquainted to versatile tools and techniques employed in genetic engineering and appraise them with its applications.</p> <p>d) learn about various tools, enzymes used in recombinant DNA technology and can apply the knowledge to modify the useful organisms.</p>
<b>MSBT(C9)-303</b>	<b>Research Methodology</b>	<p>Students will be able to:</p> <p>a) apply the tools and techniques of research.</p> <p>b) create a sound knowledge for the data collection and interpretations.</p> <p>c) Understand and practice scientific reading, writing and presentations.</p>
<b>MSBT(E5)-304</b>	<b>Opt I Bioinformatics</b>	<p>Students will be able to:</p> <p>a) apply key concepts of different bioinformatics tools to solve the problems.</p> <p>b) analyse sequence and structure bio-macromolecule data.</p> <p>c) apply the knowledge of bioinformatics in the biotechnology research and industry.</p>
<b>MSBT(E5)-304</b>	<b>Opt II Ecological Principles</b>	<p>Students will be able to:</p> <ol style="list-style-type: none"> <li>1. understand the important concept of environment, Population and community ecology.</li> <li>2. explain the role of ecosystem and applied ecology.</li> </ol>
<b>MSBT(E6)-305</b>	<b>Opt I Plant Physiology</b>	<p>Students will be able to:</p> <p>a) explain the structure of plant organs and their functioning.</p> <p>b) acquaint for the role of nutrients in plant growth, Metabolic pathways that act as backbone for plant survival.</p> <p>c) stress physiology in plants.</p> <p>d) characterize the biotechnology based synthesis of secondary metabolites.</p>

<b>MSBT(E6)-305</b>	<b>Opt II Solid and Hazardous waste management</b>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>a) understand the various types of solid waste hazardous and radioactive waste, their collection, transportation and management techniques.</li> <li>b) apply the techniques of solid waste disposal.</li> <li>c) understand various resource recovery aspects in form of energy generation and biological methods for treatment.</li> </ul>
<b>Semester – IV</b>		
<b>MSBT(C10)-401</b>	<b>Bioprocess engineering</b>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>1. understand the concept of upstream &amp; downstream processing, and different unit operations of bioprocesses.</li> <li>2. apply the different techniques for the Recovery/purification of bioproducts.</li> <li>3. understand the different concept involved in scale up and economics involved in the bioprocess</li> </ul>
<b>MSBT(C11)-402</b>	<b>Commercial Biotechnology</b>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>1 To understand the importance of IPRs and the process of patenting.</li> <li>2 understand their personal characteristics and interests to that of the “successful” entrepreneur, identification and assess sources of support for small businesses and entrepreneurs.</li> <li>3.know various aspects of ISO and their necessity in Industries.</li> </ul>
<b>MSBT(C12)-403</b>	<b>Tissue &amp; cell culture technology</b>	<p>Students will be able to :</p> <ul style="list-style-type: none"> <li>a) understand about plant and animal tissue culture techniques, gene transfer methods, applications of plant tissue culture, transgenic animals, methods of embryo cloning in animals.</li> <li>b) Explain the concept large scale culturing of animal cell lines, somatic cell fusion and its applications</li> </ul>

## **The Program Specific Outcomes and Course Outcomes of all the Programmes**

### **Program Name: Master of Science in Botany (M. Sc. Botany)**

#### **Program Educational Objectives (PEO)**

**Program Name:-Masters of Science in Botany**

**Program Code:- MSBOT**

**PEO 1.** To acquire in-depth knowledge of Practical techniques, which provide a solid foundation to pursue continuing education and nurture the talent for innovation and research.

**PEO 2.** Holistic development of students by active participation in seminars, research projects focusing on workshops, conferences for lifelong continuous learning.

**PEO 3.** Pursue higher education and research in reputed institute at national and international level.

**PEO 4.** To excel in careers by being a part of success and growth of an organization with which they are associated.

#### **Program Outcomes (PO)**

**Program Name:- Masters of Science in Botany**

**Program Code:- MSBOT**

**PO 1.** The M.Sc. - Botany programme is designed to equip students with essential knowledge and technical skills to study plants in a holistic manner.

**PO 2.** Students would be exposed to cutting-edge technologies that are currently used in the study of plant life forms, their evolution and interactions with other organisms within the ecosystem.

**PO 3.** Students would also become aware of the social and environmental significance of plants and their relevance to the national economy.

**PO 4.** Students would be trained in all areas of plant biology using a unique combination of core and elective papers with significant inter- disciplinary components.

#### **Program Specific Outcomes (PSO)**

**Program Name:- Masters of Science in Botany**

**Program Code:- MSBOT**

**PSO 1.** The student completing the course is capable to under the every aspects of biology and diversity of Algae, Fungi, microbes (virus and Bacteria), and Bryophytes, Pteridophytes, Gymnosperms and

Angiosperms. These course will empower students knowledge in the basic botany and draw out some useful products from this more or less overlooked plant treasure.

**PSO 2.** A student completing the course is able to understand different specializations of Botany such as systematics, evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics, cell & molecular biology of various life-forms.

**PSO 3.** The student completing the course is trained in various analytical techniques of plant biology, use of plants as industrial resources or as human livelihood support system and is well versed with the use of transgenic technologies for basic and applied research in plants.

**PSO 4.** The student completing the course is able to identify various life forms of plants, design and execute experiments related to basic studies on evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics, microbiology, molecular biology. Students are also familiarized with the use of bioinformatics tools and databases and in the application of statistics to biological data.

**PSO 5.** The student completing the course is capable of executing short research projects incorporating various tools and techniques in any of the basic specializations of Plant Sciences under supervision.

### Course Outcome for M. Sc. Botany

Course Code	Course	Course Outcome
<b>BOT-PG -101</b>	<b>Cell Biology and Molecular Biology</b>	To acquaint the student about the study of the Biomolecules, plant cell structure, function and cell organelles
<b>BOT-PG -102</b>	<b>Biology and Diversity of Viruses, bacteria and Fungi</b>	To acquaint the students about the study of various microorganisms, like viruses, Bacteria and Fungi.
<b>BOT-PG -103</b>	<b>Biology and diversity of Algae, Bryophytes, Pteridophytes and Gymnosperms</b>	To acquaint the students about the study of various land plants except Angiosperms
<b>BOT-PG -104</b>	<b>a. Industrial Microbiology</b>  <b>b. Weed Biology</b>	To impart knowledge about the theoretical and practical knowledge about Industrial Microbiology. To study common weed plants and their impact and eradication measures.
<b>BOT-PG -105</b>	<b>Information Technology</b>	To prepare students to be able to design, implement, and evaluate a computer-based system, process, component, or program to meet biological desired needs

<b>BOT-PG -201</b>	<b>Cytogenetics and Molecular Genetics</b>	To enhance students knowledge for the cytological and molecular aspects of gene and its related aspects.
<b>BOT-PG -202:</b>	<b>Taxonomy of Angiosperms</b>	To impart knowledge about the keys, floras and other standards used in plant taxonomy, and other recent advances in the field.
<b>BOT-PG -203</b>	<b>Plant Physiology and Metabolism</b>	To enhance the practical and theoretical knowledge about the various physiological and metabolic phenomenons in the plants.
<b>BOT-PG -204</b>	<b>a. Paleobotany</b> <b>b. Ethnobotany</b>	To impart knowledge about the plant ancestors and related studies To impart theoretical and practical knowledge and explore about traditional plant knowledge.
<b>BOT-PG -205</b>	<b>Computer Applications and Databases</b>	To prepare students to be able to design, implement, and evaluate a computer-based system, process, component, or program to meet biological desired needs.
<b>BOT-PG -301</b>	<b>Plant Development and Reproduction</b>	To impart knowledge about development, and structure and functions of various reproduction related phenomenon in plants.
<b>BOT-PG -302</b>	<b>Plant Ecology</b>	To impart knowledge about the theoretical and practical knowledge about plant ecology.
<b>BOT-PG -303</b>	<b>a. Crop Genetics and Plant Breeding</b> <b>b. Plant Pathology</b>	To impart knowledge about the various numerical problems and other aspects in related to crop plants. To enhance the knowledge about different fungal diversity and various plant diseases and pathogens.
<b>BOT-PG -304.</b>	<b>a. Plant Protection</b> <b>b. Plant Propagation</b>	To study how to prevent plant losses in Agriculture. To introduction to the techniques and facilities needed for plant propagation in the green house and nursery industry
<b>BOT-PG -305</b>	<b>Biostatistics</b>	To understanding of the central concepts of modern statistical theory and their probabilistic foundation.
<b>BOT-PG -401</b>	<b>Plant Cell, tissue and Organ Culture</b>	To introduces the practice and process of culturing plant cells and cell lines in a laboratory.

<b>BOT-PG -402</b>	<b>Plant Resource Utilization</b>	To enlighten the students with traditional economic plants.
<b>BOT-PG -403</b>	<b>a. Crop Genetics and Plant Breeding b. Plant Pathology</b>	To impart knowledge about the various numerical problems and other aspects in related to crop plants. To enhance the knowledge about different fungal diversity and various plant diseases and pathogens.
<b>BOT-PG -404</b>	<b>a. Forest Biology  b. Phytochemistry</b>	To enhance the knowledge about from population genetics to ecosystem science  To enhance the knowledge about from various mechanics of plant biochemistry
<b>BOT-PG -405</b>	<b>Bioinformatics</b>	The course emphasizes the integration of computer science with biology.

**Program Educational Objectives (PEO)**  
**Program Name:- Bachelor of Science in Botany**  
**Program Code:- BSHBOT**

**PEO 1.** To acquire in-depth knowledge of Practical techniques, which provide a solid foundation to pursue continuing education and nurture the talent for innovation and research.

**PEO 2.** To excel in careers by being a part of success and growth of an organization with which they are associated.

**PEO 3.** Holistic development of students by active participation in seminars, research projects focusing on workshops, conferences for lifelong continuous learning.

**PEO 4.** Pursue higher education and research in reputed institute at national and international level.

**Program Outcomes (PO)**  
**Program Name:- Bachelor of Science in Botany**  
**Program Code:- BSHBOT**

**Programme Objectives (POs):**

**PO 1.** The B.Sc. - Botany programme is designed to equip students with essential knowledge and technical skills to study plants in a holistic manner.

**PO 2.** Students would be trained in all areas of plant biology using a unique combination of core and elective papers with significant inter-disciplinary components.

**PO 3.** Students would be exposed to cutting-edge technologies that are currently used in the study of plant life forms, their evolution and interactions with other organisms within the ecosystem.

**PO 4.** Students would also become aware of the social and environmental significance of plants and their relevance to the national economy.

**Program Specific Outcomes (PSO)**  
**Program Name:- Bachelor of Science in Botany**  
**Program Code:- BSHBOT**

**Programme Specific Outcomes (PSOs):**

**PSO 1.** A student completing the course is able to understand different specializations of Botany such as systematics, evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics, cell & molecular biology of various life-forms.

**PSO 2.** The student completing the course is trained in various analytical techniques of plant biology, use of plants as industrial resources or as human livelihood support system and is well versed with the use of transgenic technologies for basic and applied research in plants.

**PSO 3.** The student completing the course is able to identify various life forms of plants, design and execute experiments related to basic studies on evolution, ecology, developmental biology, physiology, biochemistry, plant interactions with microbes and insects, morphology, anatomy, reproduction, genetics, microbiology, molecular biology, recombinant DNA technology, proteomics and transgenic technology. Students are also familiarized with the use of bioinformatics tools and databases and in the application of statistics to biological data.

**PSO 4.** The student completing the course is capable of executing short research projects incorporating various tools and techniques in any of the basic specializations of Plant Sciences under supervision.

**Course Outcome for B. Sc. (Hons.) Botany**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
<b>BOT-UG - 101</b>	<b>Phycology and Microbiology</b>	To acquaint the students about the study of various microorganisms and Algae.
<b>BOT-UG 102</b>	<b>Biomolecules and cell Biology</b>	To acquaint the student about the study of the Biomolecules, plant cell structure, function and cell organelles
<b>BOT-UG - 103</b>	<b>Environmental Sciences</b>	The major objective is to sensitize students for environment consciousness and

		sustainability as well as ethics regarding self and society.
<b>BOT-UG - 104</b>	<b>Punjabi compulsory</b>	To impart knowledge about the Punjabi language and literature.
<b>BOT-UG - 105</b>	<b>Plant Ecology and Taxonomy</b>	To impart knowledge about the keys, floras and other standards used in plant taxonomy, and also enhance the practical knowledge about plant ecology.
<b>BOT-UG - 201</b>	<b>Mycology and phytopathology</b>	To enhance the knowledge about different fungal diversity and various plant diseases and pathogens.
<b>BOT-UG - 202</b>	<b>Archeogoniatae</b>	To enhance the knowledge about different primitive land plants.
<b>BOT-UG - 203</b>	<b>English</b>	To impart knowledge about English languages and literature
<b>BOT-UG 204</b>	<b>Economic Botany and Biotechnology</b>	To enlightened the students with traditional economic plants and also impart knowledge about recent techniques used in plant sciences.
<b>BOT-UG 205</b>	<b>Drug abuse</b>	The major objective we are able to sensitise students against problems associated with drugs. It describes about the psychological, physical and social effects of psychoactive substances on person using it and its prevention and recovery
<b>BOT-UG -301</b>	<b>Anatomy of angiosperms</b>	To impart knowledge about various aspects of anatomical features and other adaptations in the plants.
<b>BOT-UG -302</b>	<b>Economic Botany</b>	To enlightened the students with traditional economic plants
<b>BOT-UG -303</b>	<b>Genetics</b>	To impart knowledge about the various numerical problems and other aspects in related to plant genetics.
<b>BOT-UG -304</b>	<b>Mushroom Culture and Technology</b>	To impart theoretical as well as practical knowledge regarding various aspects of mushroom cultivation.
<b>BOT-UG -305</b>	<b>Plant anatomy and Embryology</b>	To impart knowledge about various aspects of anatomical and embryological studies in plants.
<b>BOT-UG -401</b>	<b>Molecular Biology</b>	<ol style="list-style-type: none"> <li>1. Students will have developed knowledge about nucleus and its ultrastructure. They will also identify various forms of DNA.</li> <li>2. Student will understand the importance of stresses in plants and</li> </ol>

		how it responds.
<b>BOT-UG -402</b>	<b>Ecology</b>	To impart knowledge about the theoretical and practical knowledge about plant ecology.
<b>BOT-UG -403</b>	<b>Plant Systematics</b>	To impart knowledge about the keys, floras and other standards used in plant taxonomy, and other recent advances in the field.
<b>BOT-UG -404</b>	<b>Nursery and Gardening</b>	To impart theoretical as well as practical knowledge regarding various aspects of nursery and gardening.
<b>BOT-UG -405</b>	<b>Plant Physiology and Metabolism</b>	To enhance the practical and theoretical knowledge about the various physiological and metabolic phenomenon in the plants.
<b>BOT-UG -501</b>	<b>Reproductive Biology of Angiosperms</b>	To impart knowledge about structure and functions of various reproduction related phenomenon in plants.
<b>BOT-UG -502</b>	<b>Plant Physiology</b>	To enhance the practical and theoretical knowledge about the various physiological phenomenon's in the plants
<b>BOT-UG -503</b>	<b>Research Methodology</b>	To impart knowledge about various aspects of research and to impart knowledge about separation techniques, Microscopy and other laboratory techniques.
<b>BOT-UG -504</b>	<b>Plant Breeding:</b>	To enlightened the students with various aspects of plant breeding, like self and cross hybridization, emasculation, etc.
<b>BOT-UG -601</b>	<b>Plant Metabolism:</b>	To enhance the practical and theoretical knowledge metabolic phenomenon in the plants
<b>BOT-UG -602</b>	<b>Plant Biotechnology</b>	To enlightened the students with recent techniques used in plant sciences.
<b>BOT-UG -603</b>	<b>Bioinformatics</b>	The course emphasizes the integration of computer science with biology
<b>BOT-UG -604</b>	<b>Project</b>	To enhance the practical knowledge with a given assignment/ project/ dissertation

## **Program Name: Master of Science in Chemistry (M.Sc.)**

**Program Code:- MSCHE**

### **PROGRAM EDUCATIONAL OUTCOMES (PEO)**

The Post Graduates of the M.Sc Chemistry program are expected to:

- PEO1: acquire competencies and skills which can help them succeed in their chosen profession in academics, research or industry;
- PEO2: demonstrate professional excellence, leadership qualities and contribute towards the development of their communities and society
- PEO3: analyze and solve practical problems of the society through application of acquired skills and competencies.
- PEO4: use scientific method to approach and solve real life problems.
- PEO5: demonstrate moral values, professional ethics and contribute towards the betterment of the society.

### **PROGRAM SPECIFIC OUTCOMES: (PSO)**

On completion of M.Sc. Chemistry program, students will be able to

- PSO1: learn and understand fundamental and advanced concepts in organic, inorganic and physical chemistry.
- PSO2: apply the chemical concepts to solve complex chemical problems, e.g., analysis of data, synthetic logic, spectroscopy, structure and modeling etc.
- PSO3: design and perform experiments, interpret experimental results, perform calculations on these results and draw reasonable, accurate conclusions.
- PSO4: handle and operate scientific instruments and analyse the results obtained
- PSO5: Apply advanced concepts of organic, analytical, physical and inorganic chemistry to solve complex problems of relevance to society to improve human life.
- PSO6: Perform experiments to provide solutions to different industrial problems by working in the pure, inter and multi-disciplinary areas of chemical sciences.
- PSO7: undertake discipline specific competitive exams conducted by service commission.
- PSO8: work as professionals in educational institutes and chemical, pharmaceutical, and related industries.
- PSO9: pursue advanced studies or research in chemistry field.
- PSO10: synthesize new materials and develop new chemical products.

## PROGRAM OUTCOMES (PO) :

On successful completion of the M.Sc. chemistry programme, the students will have

PO1: knowledge and understanding of the scientific concepts.

PO2: ability to design and perform experiments in a laboratory.

PO3: present scientific and technical information resulting from laboratory experimentation in both written and oral formats.

PO4: an understanding of the professional, ethical and moral responsibilities.

PO5: ability to think critically, analyse and solve complex chemical problems.

PO6: develop career skills through engaging in lifelong learning.

### Course Outcome:

Course Code	Course	Course Outcome
MCH 101	Inorganic Chemistry	<ol style="list-style-type: none"><li>1. This course will enable the students to learn basic concepts of chemical bonding and theoretical treatment of bonding by various theories.</li><li>2. The students will be able to understand the bonding in complexes with pi- acid ligands and hard-soft interactions.</li><li>3. The students will be able to learn about the important compounds of main group elements including boranes, silicates, zeolites, organometallic compounds.</li><li>4. The students will be able to apply the learnt concepts to predict bond order, pi-acidity as well as hardness and softness of ligands, important properties of main group elements.</li></ol>
MCH 102	Organic Chemistry	<ol style="list-style-type: none"><li>1. This course will enable the students to understand the basic concepts and mechanism in organic chemistry.</li><li>2. The students will get an idea about the various kinetic and thermodynamic factors which control the organic reactions and to understand the nature of bonding in organic molecules.</li><li>3. The students will get an idea about techniques used for determination of reaction mechanism.</li><li>4. The students will be able to understand the concept and definitions of aromaticity.</li><li>5. The students will be familiarised with the important Pericyclic and elimination reactions in organic chemistry.</li></ol>

MCH 103	Physical Chemistry	<ol style="list-style-type: none"> <li>1. The students will be able to learn the basic concepts used in thermodynamic processes to calculate changes in kinetic, potential, enthalpy and internal energy.</li> <li>2. The students will be able to understand the formulation of the first law of thermodynamics for closed systems and arrange the change in energy in the closed systems via heat and work transfer.</li> <li>3. The students will be able to construct energy and mass balance for unsteady-flow processes and thermodynamic applications using second and third law.</li> <li>4. The students will be familiarised with electrochemical systems of electric energy production, Electrochemical processes of surface treatment and production of materials.</li> </ol>
MCH 104 A	Mathematics for Chemists	<ol style="list-style-type: none"> <li>1. The students will be able to understand the basic concepts of Matrix Algebra such as Addition and multiplication,</li> <li>2. The students will be able to find determinants inverse, adjoint and transpose of matrices.</li> <li>3. The students will be able to solve Homogeneous, non-homogeneous, linear equations</li> <li>4. The students will be able to find linear dependence and independence. Eigen values and Eigen vectors.</li> <li>5. The students will be familiarised with relation between degree and radian,</li> <li>6. The students will be able to learn Concept of periodicity of trigonometric functions, values of trigonometric functions for different angles, trigonometric functions of sum and differences of angles, additions and subtraction formulae.</li> <li>7. The students will be able to understand Differentiability, rules for differentiation, applications of differential calculus including maxima and minima.</li> <li>8. The students will be able to understand Basic rules for integration, integration by parts, partial fraction and Substitution, definite integrals.</li> <li>9. The students will be able to obtain an integrating factor which may reduce a given differential equation into an exact one and eventually provide its solution.</li> <li>10. The students will be able to Identify and obtain the solution of Clairaut's equation.</li> <li>11. The students will be able to define the complementary function and particular integrals of linear differential equation.</li> <li>12. The students will be able to conceive the basic</li> </ol>

		<p>concepts of Permutations and combinations, probability, probability theorems examples from the Kinetic theory</p>
MCH 104 B	Biology for Chemists	<ol style="list-style-type: none"> <li>1. The students will be able to demonstrate and realise the importance of Chemistry in Biological terms both theoretically and practically. Students may also choose to specialize in a particular field within biology.</li> <li>2. Since Chemistry is the fundamental basis of all the life processes occurring in a living organism, hence it would be of interest for the students towards better understanding of mechanisms of chemical reactions; study its kinetics for its application in molecular research.</li> <li>3. The students will be able to apply their knowledge and relate it in terms of disease study, its cause, prognosis, diagnosis and treatment.</li> <li>4. This course would provide students with ample opportunities in the art of critical thinking, associated cognitive skills in the formulation of a problem, data gathering and analysis, and interpretation of results to address practical questions relating various fields of genetics and molecular biology: studying molecular mechanisms behind molecular motors, DNA replication, repair, transcription etc.</li> <li>5. It can even lead the students to create some innovative applications of chemistry in multiple fields of biology (biodiversity, forensics, environmental pollution etc.)</li> </ol>
MCH -105	Inorganic Chemistry Practical	<ol style="list-style-type: none"> <li>4. The course will enable the students to carry out standardisation of various reagents like <math>\text{KMnO}_4</math>, <math>\text{K}_2\text{Cr}_2\text{O}_7</math>, <math>\text{Na}_2\text{S}_2\text{O}_3</math> and carry out oxidation-reduction titrations.</li> <li>5. The students will be able to carry out precipitation titrations using <math>\text{AgNO}_3</math>.</li> <li>6. They will be able to determine metals by complexometric titrations using EDTA.</li> <li>7. They will be able to carry out gravimetric/titrimetric determination of mixed metal ions.</li> <li>8. The students will be able to carry out synthesis of simple coordination compounds.</li> </ol>
MCH -106	Analytical Chemistry Practical	<ol style="list-style-type: none"> <li>1. The students will be able to demonstrate the complexometric titrations.</li> <li>2. The students will be able to calculate the equivalence point by using the conductometric, pH metric and potentiometric titrations.</li> </ol>

MCH -201	Inorganic Chemistry	<ol style="list-style-type: none"> <li>7. The students will be able to understand and apply symmetry elements, carry out symmetry operations and find point groups of molecules.</li> <li>8. The students will learn about character tables and apply group theory to chemical bonding, directed valence and splitting of orbitals.</li> <li>9. The students will learn to apply group theory in spectroscopy to know activity of transitions.</li> <li>10. The students will be able to understand the concepts of various theories of metal ligand bonding in coordination complexes.</li> <li>11. The students will be able to find out term symbols for various configurations and the effect of weak, medium and strong ligand field on these term symbols.</li> </ol>
MCH -202	Organic Chemistry	<ol style="list-style-type: none"> <li>1. The students will be able to apply stereochemical aspects to reaction mechanism and learn methods of racemisation and resolution.</li> <li>2. The students will recognize stereochemistry and be able to apply the Cahn-Ingold-Prelog system to designation of stereochemistry (E/Z, R/S, <i>re/si</i>).</li> <li>3. The students will be able to know stereochemistry and various possible conformations of organic compounds.</li> <li>4. The students will take up detailed study of Conformational Isomerism and geometrical isomerism</li> <li>5. The students will recognize mechanistic and stereochemical aspects of addition reactions to carbon-carbon multiple and carbon-hetero multiple bond.</li> </ol>
MCH -203	Physical Chemistry	<ol style="list-style-type: none"> <li>6. This course will enable the students to learn the basic postulates of quantum mechanics.</li> <li>7. To enable the students to solve the simple quantum mechanical models such as simple harmonic oscillator, particle in a 1D, 3D - box.</li> <li>8. The students will be able to understand the quantum mechanical aspect of angular momentum and spin angular momentum.</li> <li>9. The students will learn the application to harmonic oscillator, rigid rotor, one-electron and many-electron atoms, and homo-and hetero-nuclear diatomic molecules.</li> <li>10. The students will be able to understand the use of the Huckel rule to conjugate systems..</li> <li>11. The students will be able to learn the different theories of reaction rates and factors affecting reaction rates.</li> <li>12. The students will get an idea about the different types of catalysis and their mechanisms.</li> </ol>
MCH -204	Computer	<ol style="list-style-type: none"> <li>1. The students will be able to apply algorithmic</li> </ol>

	Fundamentals and Programming With C	<p>reasoning to a variety of computational problems.</p> <ol style="list-style-type: none"> <li>The students will be able to design, correctly implement and document solutions to significant computational problems.</li> <li>The students will be able to implement software systems that meet specified design and performance requirements.</li> <li>The students will be able to work effectively in teams to design and implement solutions to computational problems.</li> <li>The students will be able to communicate effectively, both orally and in writing.</li> <li>The students will be able to recognize the social and ethical responsibilities of a professional working in the discipline.</li> </ol>
MCH -205	Organic Chemistry Practicals	<ol style="list-style-type: none"> <li>The students will be able to separate and purify an organic mixture by chemical/solvent separation methods.</li> <li>The students will be able to prepare organic compounds via multi step synthetic sequences</li> <li>The students will be able to employ methods for synthesis like oxidation, condensation, Substitution and heterocyclic ring formation etc.</li> <li>The students will be able to monitor the progress of the reaction by chromatographic and spectral technique (FTIR).</li> </ol>
MCH -206	Physical Chemistry Practicals	<ol style="list-style-type: none"> <li>The students will able to demonstrate the practicals of viscosity, surface tension, kinetics, refractometer and Partition function.</li> </ol>
MCH -301	Analytical Chemistry	<ol style="list-style-type: none"> <li>The students will be able to explain the fundamentals of analytical chemistry and steps of a characteristic analysis, express the role of analytical chemistry in science, Compare qualitative and quantitative analyses.</li> <li>The students will be able to estimate kinds of errors in chemical analysis. Evaluate the effects of systematic errors on analytical results. Compare of the experimental mean with a true value and two experimental means.</li> <li>The students will be able to determine the detection limits. Interpret the statistical tests. Interpret the sources of random errors and effects of random errors on analytical results.</li> <li>The students will be able to explain the sources of</li> </ol>

		<p>random errors. Specifies the standard deviation of calculated results.</p> <p>5. The students will be able to express the significant figures and rounding of data, identify quality of experimental measurements, detection limit and explain the confidence level and confidence limit.</p>
MCH -311	Chemistry of Transition and Inner Transition Elements	<p>1. The students will be able to understand how electronic properties of transition metals can influence reactivity, atomic size and other physical and chemical properties of the elements.</p> <p>2. The students will be able to understand the mechanisms of recovery of pure metal from their respective ores and formation of coordination complexes with various ligands.</p> <p>3. They will be able to understand reaction mechanisms of their synthesis, to study structural information and their uses in day to day life.</p> <p>4. They will be able to apply their understanding to predict electronic spectra of transition metal complexes.</p> <p>5. The students will be able to evaluate the magnetic properties of transition metal complexes by studying origin and type of magnetic behaviour, and its variation with temperature.</p>
MCH -312	Reaction Mechanisms of Transition Metal Complexes	<p>1. The students will be able to understand the mechanisms and rates of substitution reactions in octahedral complexes.</p> <p>2. They will be able to understand reaction mechanisms of square planar complexes.</p> <p>3. They will be able to comprehend the mechanisms of electron transfer reactions and photochemical reactions.</p> <p>4. The students will be able to understand the reaction mechanisms of oxidative addition, reductive elimination, insertion and migration reactions.</p> <p>5. The students will be able to understand the factors affecting the stability of complexes and apply various methods to determine the stability of complexes.</p>
MCH -313		<p>1. The students will achieve advanced knowledge about the interactions of electromagnetic radiation and matter and their applications in spectroscopy.</p> <p>2. The students will be able to apply formalisms based on molecular symmetry to predict spectroscopic properties.</p> <p>3. They will be able to analyze and interpret</p>

		<p>spectroscopic data collected by the methods discussed in the course.</p> <ol style="list-style-type: none"> <li>They will be able to solve problems related to the structure, purity and concentration of chemicals and molecular interactions by choosing suitable spectroscopic methods and interpreting corresponding data.</li> <li>The students will be able to apply the following methods: Electronic absorption spectroscopy of atoms and molecules, IR spectroscopy, Light scattering and Raman spectroscopy, NMR spectroscopy, NQR spectroscopy, MASS spectroscopy, EPR spectroscopy and Moss-Bauer spectroscopy.</li> </ol>
MCH -314	Inorganic Chemistry Practicals-I	<ol style="list-style-type: none"> <li>The students will be able to synthesise coordination compounds.</li> <li>They will be able to record the UV-Vis and IR spectra of synthesised compound</li> <li>They will be able to estimate the metal and ligand present in the prepared complex.</li> <li>They will learn to determine stoichiometry of the metal-ligand complexes by Job's and mole ratio method.</li> </ol>
MCH -315	Inorganic Chemistry Practicals-II	<ol style="list-style-type: none"> <li>The students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of various experiments, like conductometry, pH metery.</li> <li>The students will learn about applications of the chromatography by Paper, Thin Layer and column chromatography.</li> <li>They will be able to understand Solvent extraction techniques.</li> </ol>
MCH -321	Applications of Organic Molecular Spectroscopy	<ol style="list-style-type: none"> <li>The students will get a deep insight into the various spectroscopic methods used for the characterization of organic compounds.</li> <li>The students will be able to elucidate the structure of compounds by analyzing the spectral Data.</li> <li>The students will be able to apply the concepts of Chemical Shift, deshielding, correlation for protons bonded to carbon and other nuclei.</li> <li>The students will be able to understand the concepts of <math>^{13}\text{C}</math> NMR spectroscopy: FT-NMR, type of <math>^{13}\text{C}</math> NMR spectra, proton decoupled, off resonance, APT, INEPT, DEPT, Chemical shift, nuclear and hetero nuclear coupling constant.</li> <li>The students will be able to apply 2D NMR techniques for structure correlation of certain</li> </ol>

		<p>compounds.</p> <ol style="list-style-type: none"> <li>The students will be able to understand mass spectrometry, its Instrumentation, various methods of ionization, Different detectors, rules of fragmentations of different functional groups.</li> <li>The students will be able to apply the gained knowledge to solve the structure related problems of organic compounds.</li> </ol>
MCH -322	Photochemistry and Pericyclic Reactions	<ol style="list-style-type: none"> <li>Students will know about the stereochemical problems in relation to chemical transformations.</li> <li>Students will learn different types of rearrangement reactions</li> <li>Students will know synthetically the processes relevant organic-chemical reactions and be able to discuss the mechanism of these reactions</li> <li>Students will learn the Photochemical excitation and Jablonski diagram.</li> <li>To impart the students knowledge about the study of photochemistry of ketone-photo reduction-photo cycloaddition.</li> <li>Students will do detailed study of Pericyclic reactions and Cyclo addition and sigmatropic reactions.</li> </ol>
MCH -323	Chemistry of Natural Products	<ol style="list-style-type: none"> <li>The students will learn about the chemistry of carbohydrates, heterocyclic compounds, amino acids, proteins and nucleic acids.</li> <li>The students will be acquainted with the fundamentals of terpenoids, alkaloids, vitamins, lipids and steroids.</li> <li>The students will be able to determine the complex structure of steroids.</li> </ol>
MCH -324	Organic Chemistry Practicals-I	<ol style="list-style-type: none"> <li>The students will be able to prepare organic compounds via multi step synthetic sequences</li> <li>The students will know the various methods employed for reactions.</li> <li>The students will be able to monitor the progress of a reaction.</li> <li>The students will learn how to characterize the synthesized compounds.</li> </ol>
MCH -325	Organic Chemistry Practicals-II	<ol style="list-style-type: none"> <li>The students will gain knowledge of methods for calibration and sampling applied to quantitative analysis.</li> <li>The students will be able to design and carry out scientific experiments as well as accurately record and analyse the results of such experiments.</li> <li>The students will be able to apply the analytical methods based on titrations practically.</li> </ol>

		<ol style="list-style-type: none"> <li>The students will be able to critically evaluate data collected to determine the identity, purity, and percent yield of product.</li> <li>The students will be able to determine the percentage purity of sugar by Fehling's method and Benedict's solution</li> </ol>
MCH -331	Spectroscopy-I	<ol style="list-style-type: none"> <li>The students will gain advanced knowledge about the interactions of electromagnetic radiation and matter and their applications in spectroscopy. Be able to apply formalisms based on molecular symmetry to predict spectroscopic properties.</li> <li>The students will be able to solve problems related to the structure, purity and concentration of chemicals and to study molecular interactions by choosing suitable spectroscopic methods and interpreting corresponding data.</li> <li>The students will be able to learn the basic principle of different techniques employed in molecular spectroscopy.</li> <li>The students will be able to study the origin, instrumentation and important applications of Microwave, IR, Raman, UV, NMR, NQR, ESR and EQR techniques.</li> </ol>
MCH -332	Statistical Thermodynamics	<ol style="list-style-type: none"> <li>This course will enable the students to describe and explain give an account on the macroscopic and microscopic description of entropy and free energy in terms of thermodynamic probability.</li> <li>Students will be able to understand the theory of statistical mechanics to construct the microscopic models for gases and crystals and describe transport phenomenon.</li> </ol>
MCH -333	Fundamental and Atmospheric Photochemistry	<ol style="list-style-type: none"> <li>This course will enable the students to describe and explain photochemical and photo physical processes and mechanisms with suitable theoretical models, and apply established experimental methods for the investigation of these processes.</li> <li>The students will be able to describe the interaction of excited states with their surroundings and analyze photo induced electron transfer and excitation energy transfer with quantitative models</li> <li>The students will get knowledge about photochemical and photo physical processes and the reactivity of excited states to explain applications in photochemical energy conversion and other selected issues.</li> <li>The students will be able to develop knowledge of chemical and biochemical principles of fundamental</li> </ol>

		<p>environmental processes in air and Recognize different types of toxic substances &amp; responses and analyze toxicological information.</p> <p>5. The students will learn the basic chemical concepts to analyze chemical processes involved in different environmental problems and describe causes and effects of environmental pollution by energy industry.</p>
MCH -334	Instrumental Physical Chemistry Practicals-I	1. The students will be able to learn the knowledge of spectrophotometer and polarimeterpracticals.
MCH -335	Physical Chemistry Practicals-I	1. The students will be able to calculate the order and rate of reaction and eutectic point by using phase equilibria and also get practical knowledge about thin layer chromatography.
MCH -401	Environmental Chemistry	<p>1. The students will be able to demonstrate knowledge of chemical and biochemical principles of fundamental environmental processes in air, water, and soil. Recognize different types of toxic substances &amp; responses and analyze toxicological information.</p> <p>2. The students will be able to apply basic chemical concepts to analyze chemical processes involved in different environmental problems (air, water &amp; soil). Describe water purification and waste treatment processes and the practical chemistry involved.</p> <p>3. The students will be able to describe causes and effects of environmental pollution by energy industry and discuss some mitigation strategies. Explain energy crisis and different aspects of sustainability. Discuss local and global environmental issues based on the knowledge gained throughout the course</p> <p>4. The students will have an understanding of chemical methods employed for environmental problem solving. Experience in some scientific methods employed in environmental chemistry. Developed skills in procedures and instrumental methods applied in analytical tasks of environmental chemistry</p> <p>5. The students will be introduced to the chemistry, preparation, structure and physical properties of inorganic nanoparticles. Students will learn about methods to synthesize inorganic nanoparticles, and learn to evaluate particle size and shape distributions.</p> <p>6. They will be able to predict the stability of nanoparticles in solution, and to understand the</p>

		<p>nucleation and growth of nanoparticles. Students will also be aware of applications of nanoparticles in science and technology.</p> <p>7. The students will learn the concept of Green Chemistry its principles and applications.</p>
MCH -411	Chemistry of Organometallic Compounds	<ol style="list-style-type: none"> <li>1. The students will be able to explain and rationalize the synthesis, structure, bonding, properties and reactivity of both main group and transition metal organyls.</li> <li>2. The students will be able to explain and rationalize industrially important catalytic processes through the application of organometallic principles know important applications of organometallic homogeneous catalysis in the production of large-scale (bulk) and smaller-scale (fine chemicals) production.</li> <li>3. The students will be able to use knowledge about structure and bonding issues to understand the stability and reactivity of metal carbonyls.</li> </ol>
MCH 412	Advanced Inorganic Chemistry	<ol style="list-style-type: none"> <li>1. The course will enable the students to know about the synthesis methods and structural patterns observed in high nuclearity carbonyl clusters. They will be used to understand and apply capping rule.</li> <li>2. The students will be able to understand various aspects of radioactivity, nuclear processes and application of radioactive elements in isotopic and exchange reactions.</li> <li>3. The students will be able to learn the role of metals in biological systems, metalloenzymes, metal containing pigments and other aspects of metals in biological systems.</li> <li>4. The students will be able to understand principles of receptor design and role of receptors in recognition, transformation and transport. They will also understand the working of supramolecular devices.</li> </ol>
MCH -413	Inorganic Spectroscopy-II	<ol style="list-style-type: none"> <li>1. The student would be able to achieve advanced knowledge about the interactions of electromagnetic radiation and matter and their applications in spectroscopy.</li> <li>2. The students will be able to apply formalisms based on molecular symmetry to predict spectroscopic properties.</li> <li>3. The students will be able to analyze and interpret spectroscopic data collected by the methods discussed in the course.</li> <li>4. They will be able to understand to solve problems related to the structure, purity and concentration of chemicals and to study molecular interactions by</li> </ol>

		<p>choosing suitable spectroscopic methods and interpreting corresponding data.</p> <p>5. The students will learn about applications of the following methods: Electronic absorption spectroscopy of atoms and molecules, IR spectroscopy, Light scattering and Raman spectroscopy, NMR spectroscopy, NQR spectroscopy, MASS spectroscopy, EPR spectroscopy and Moss-Bauer spectroscopy.</p>
MCH -414	Inorganic Chemistry Practicals-I	<ol style="list-style-type: none"> <li>1. The students will be able to carry out preparation of various compounds and study their important properties viz. UV-Vis and IR spectra.</li> <li>2. To give students a comprehensive understanding of the stereochemistry of synthesized compounds.</li> <li>3. The students will be able to gain the skill to design and carry out experiments in order to synthesized Nano particles, use of ionic liquids and isolation of silver from lab waste.</li> </ol>
MCH -415	Inorganic Chemistry Practicals-II	<ol style="list-style-type: none"> <li>1. The students will be able to determine Fe(II), Fe(III), Cu(II), Cr(III), Ni(II) spectrophotometrically by complexation with suitable ligands.</li> <li>2. They will be able to assign transitions and determine oscillator strengths in the UV-Vis spectra of transition metals.</li> <li>3. The students will understand the basis of spectrochemical series and will be able to determine the relative position of ligands on basis of <math>10Dq</math> value.</li> <li>4. They will become capable of recording the fluorescence spectra of organic dyes and understand fluorescence quenching phenomenon</li> <li>5. The students will have a basic knowledge about the working of HPLC and GC.</li> </ol>
MCH -421	Name Reactions and Reagents in Organic Synthesis	<ol style="list-style-type: none"> <li>1. The students will get insights into reactions and reagents in organic synthesis.</li> <li>2. The students will study the various name reaction with examples.</li> <li>3. The students will learn the mechanism of rearrangement reaction, use synthetic reagent of oxidation and reduction for solving the problems.</li> </ol>
MCH -422	Organic Synthesis	<ol style="list-style-type: none"> <li>1. The students will know the various methods employed for reactions like oxidation, reduction, carbocyclic and heterocyclic ring formation etc.</li> <li>2. The students will know the utility of protecting group strategy in organic synthesis.</li> </ol>

		<ol style="list-style-type: none"> <li>The students will be familiarised with the basic principles of retro syntheses, biosynthesis and biomimetic synthesis.</li> </ol>
MCH -423	Heterocyclic Chemistry	<ol style="list-style-type: none"> <li>The students will learn naming heterocycles using various methods of nomenclature.</li> <li>The students will understand the criteria of aromaticity in heterocycles and the outcomes of steric and stereo electronic effects in non-aromatic heterocycles</li> <li>The students will gain understanding of various synthetic strategies and application of those methods for the preparation of specific groups of heterocyclic systems.</li> <li>The students will be made familiar with particular properties, reactions, and applications of the most important as well as less common heterocycles.</li> </ol>
MCH -424	Organic Chemistry Practicals-I	<ol style="list-style-type: none"> <li>The students will get insights into different reactions and reagents in organic synthesis.</li> <li>The students will gain the skill of use of protecting group strategy in organic synthesis.</li> <li>To further strengthen the ability of the students to characterize the compounds and monitoring of the reactions.</li> </ol>
MCH -425	Organic Chemistry Practicals-II	<ol style="list-style-type: none"> <li>To know the application of analytical methods based on titrations.</li> <li>The principles of chromatography for characterizing aminoacids, sugars and dyes.</li> <li>Students will gain an understanding of sampling for absorbance spectrophotometry.</li> <li>To utilize UV spectrophotometry to monitor quantitative analysis.</li> <li>To understand the performance of graphical analysis to analyze laboratory results.</li> </ol>
MCH -431	Spectroscopy-II	<ol style="list-style-type: none"> <li>This course will enable the students to learn the concepts of the fundamentals of spectroscopy and its applications in the study of structure of atoms, bonding in molecules and molecular spectroscopy.</li> <li>The students will get the knowledge of the fundamentals of mass spectrometry, AES, PES, AES, Photoelectric effect, Mossbauer spectroscopy, Flame photometry, Refractometry, CD and ORD.</li> <li>The students will be able to study the origin, instrumentation and important applications of mass spectrometry, AES, PES, AES, Photoelectric effect, Mossbauer spectroscopy, Flame photometry, Refractometry, CD and ORD.</li> </ol>

MCH -432	Solid State and Radiation Chemistry	<ol style="list-style-type: none"> <li>1. This course will enable the students to get an overview about the structure and properties of solid crystals and liquid crystals. To know the characterization of crystals using X-Ray diffraction. To learn the important aspects of gaseous state and electrochemistry.</li> <li>2. The students will learn the principle, instrumentation and applications of diffraction method. Classify porous materials and discuss in detail properties.</li> <li>3. The students will be able to understand the natural radioactivity, nuclear reactors, artificial radioactivity, Radiation sources, machine sources, Van de Graff accelerator, cyclotron, microwave linear accelerator.</li> <li>4. The students will be familiarized with band model theory for metals Intrinsic and impurity semiconductor and also understand the laser, maser and their types.</li> </ol>
MCH -433	Surface Chemistry and Polymer Chemistry	<ol style="list-style-type: none"> <li>1. This course will enable the students to Compare and contrast heterogeneous and homogeneous catalysts. Compare and contrast strong and weak chemical interactions and comment on their role in physisorption and chemisorptions.</li> <li>2. The students will be able to Explain the importance of the adsorption processes in enabling heterogeneous catalysis. Describe assumptions behind models used in derivation of adsorption isotherms.</li> <li>3. The students will be able to explain and how selected isotherms could be used for measurement of surface area of materials or in rationalization of catalysis (dissociative adsorption, mechanisms).</li> <li>4. The students will learn to reflect on the evolution of knowledge about active sites in heterogeneous catalysts. Discuss modern approaches to fabrication of model heterogeneous catalysts and contrast these with simpler ones used in industry.</li> <li>5. The students will learn about step-growth and chain polymerization, with respect to mechanism and kinetics.</li> <li>6. The students will be able to distinguish between absolute and relative methods for molecular weight determination and describe the flow properties of polymer melts and solutions by using various methods.</li> </ol>
MCH -434	Instrumental	<ol style="list-style-type: none"> <li>1. The students will be able to demonstrate the practicals</li> </ol>

	Physical Chemistry Practicals-II	of conductance, pH meter and potentiometer for calculating the end point.
MCH -435	Physical Chemistry Practicals-II	1. The students will be able to understand the variation of absorption by using different concentrations of solution with the help of spectrophotometer.

## The Program Specific Outcomes and Course Outcomes of all the Programmes

### Program Name: B.Sc. Honours Chemistry

**Program Name: Bachelor of Honors Chemistry**

**Program Code: BSHCHEM**

#### Program Educational Objectives (PEO)

The Program aims at

PEO 1: To provide the foundation in the fundamentals and applications of various spheres of Chemical sciences such as Inorganic, Organic, Analytical and Physical Chemistry.

PEO 2: To equip student with the advanced tools, techniques and instruments used in Analytical domain.

PEO 3: To familiarize students with the emerging areas of Chemistry such as Green Chemistry, Novel Inorganic Solids, Polymer Chemistry, Fuel Chemistry, Inorganic Materials of Industrial Importance, Pesticide Chemistry.

PEO 4: To develop the skills of students in the proper handling of apparatus and chemicals through practical courses.

PEO 5: To make the students explore new areas of research in chemistry and allied fields of science and technology.

PEO 6: To make the students explain why Chemistry is an integral course for addressing social, economic, and environmental problems.

#### Program Outcomes (PO) for Under Graduate Program

After completing the Program, student will be able to:

PO 1: Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.

PO 2: Solve the problem and also think methodically, independently and draw a logical conclusion.

PO 3: Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.

PO 4: Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.

PO 5: To inculcate the scientific temperament in the students and outside the scientific community.

PO 6: To develop problem solving skills.

### Program Specific Outcomes (PSO)

PSO 1: Gain the knowledge of Chemistry through theory and practical.

PSO 2: Understand good laboratory practices and safety.

PSO 3: Develop research-oriented skills and to make aware and handle the sophisticated instruments/equipments.

PSO 4: To develop skills in the proper handling of apparatus and chemicals. To be exposed to the different processes used in industries and their applications.

PSO 5: After being a graduate in Chemistry he/she can pursue the further education by joining M.Sc. (Hons.) and followed by research. He/she can lead career as a teacher. They can also join as a chemist in any research organization.

PSO 6: To understand basic facts and concepts in Chemistry while retaining the exciting aspects of Chemistry so as to develop interest in the study of chemistry as a discipline.

PSO 7: To be familiarized with the emerging areas of Chemistry and their applications in various spheres of Chemical sciences and to apprise the students of its relevance in future studies.

### Course Outcome:

Course Code	Course	Course Outcome
BHC 101	Inorganic Chemistry- I	<p>Upon completion of this Course the student should be able to:</p> <ul style="list-style-type: none"><li>• Impart a thorough knowledge about atoms and their structure and their bonding with other atoms.</li><li>• Learn the complete information about the molecular stability, feasibility and what type of elements exists and how they arranged in periodic table according to their properties.</li><li>• However, even understanding the chemical bonds lends itself to discover some important appreciation of our surrounding.</li></ul>

BHC 101(P)	Inorganic Chemistry-I Lab	<ul style="list-style-type: none"> <li>• After completion of this course the students will be able to</li> <li>• Calibrate and handle the apparatus and prepare different concentrations of solutions using normality and molarity equations.</li> <li>• Determine the concentration of an analyte of unknown concentration by making use of acid-base and oxidation-reduction titrations.</li> </ul>
BHC 102	Physical Chemistry-I	<p>After the completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• Get the complete knowledge about the gas law to gas phase reaction, perform stoichiometric calculations using gas properties and the relationship between kinetics energy and temperature of a gas.</li> <li>• Understand the influence of crystal binding energy on crystal structure and lattice vibration on thermal behaviour.</li> <li>• Demonstrate an understanding of models to describe defects and diffusion.</li> </ul>
BHC 102(P)	Physical Chemistry-I Lab	<ul style="list-style-type: none"> <li>• Students will be able to calculate the surface tension which is an important parameter in many industrial purposes.</li> <li>• Viscosity has precise importance in industry, with applications including biopharmaceutical and industrial industry.</li> <li>• Students will be acquainted to use the techniques for chemical laboratory analyses such as pH.</li> </ul>

BHC 201	Organic Chemistry-I	<p>On successful completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• Know and recall the fundamental principles of organic chemistry that include hybridization, electronic displacements &amp; types of organic reactions.</li> <li>• Describe the importance of configuration of chiral organic compounds and effect of this on physical and chemical properties.</li> <li>• Demonstrate an understanding of the structure, nomenclature, physical properties, preparation and major reactions of Aliphatic and aromatic hydrocarbons.</li> </ul>
BHC 201(P)	Organic Chemistry-I Lab	<ul style="list-style-type: none"> <li>• The students will develop skills regarding determination of melting points and boiling points used to characterize compounds and to ascertain their purity.</li> <li>• The students will be well versed to perform chromatographic techniques like thin layer and paper chromatography used for separation and quality analyses.</li> </ul>
BHC 202	Physical Chemistry-II	<ul style="list-style-type: none"> <li>• The students will develop skills regarding determination of melting points and boiling points used to characterize compounds and to ascertain their purity.</li> <li>• The students will be well versed to perform chromatographic techniques like thin layer and paper chromatography used for separation and quality analyses.</li> </ul>

BHC 202(P)	Physical Chemistry-II Lab	<ul style="list-style-type: none"> <li>• Students will be able to calculate the change in enthalpy based on Hess's law and bond energy data which is useful in predicting reactant and product throughout the course of given reaction.</li> <li>• Students will take up detail study of thermochemistry as it has various applications in chemical and biochemical system.</li> </ul>
BHC 301	Inorganic Chemistry-II	<p>Upon completion of this Course the student would be able to:</p> <ul style="list-style-type: none"> <li>• Understand the S, p block elements, noble gases and also inorganic polymer have a great role in chemistry and our life.</li> <li>• To learn the concepts of acids and bases, pH and buffer solutions and able to distinguish between acids and bases among the laboratory chemicals and real life products.</li> <li>• Apply the concept of metallurgy for purification of metals.</li> </ul>
BHC 301 (P)	Inorganic Chemistry-II Lab	<ul style="list-style-type: none"> <li>• Students understand the principle of iodometry and iodatometry and develop precise iodometric method for determination of chloride, useful in food industry.</li> <li>• Complexometric titrations are useful in a couple of different fields, namely analytical, pharmaceutical chemistry.</li> </ul>
BHC 302	Organic Chemistry-II	<p>Upon completion of this Course the student would be able to:</p> <ul style="list-style-type: none"> <li>• Apply information from general chemistry that is relevant to organic chemistry, as well as to recognize the concepts of structure and functional groups in organic chemistry.</li> <li>• Name, detail the structure, properties</li> </ul>

		<p>and reactions of alkyl and aryl halides and demonstrate an understanding of the characteristics of the nucleophilic substitution reaction.</p> <ul style="list-style-type: none"> <li>Name alcohols, ethers, carbonyl compounds, carboxylic acids, thiols, thioethers and sulphonic acid. As well as demonstrate an understanding of the major reactions of the alcohols, phenols, carboxylic acids and ethers.</li> </ul>
BHC 302 (P)	Organic Chemistry-II Lab	This course develop the basic skills for the single step and multi-step organic synthesis with the principle of organic chemistry
BHC 303	Physical Chemistry-III	<ul style="list-style-type: none"> <li>The scholar will understand the concept of eutectic point, congruent and incongruent melting points, CST and CSC by exactly knowing the equilibrium existing between different states of matter.</li> <li>The learners will understand the various phenomenon occurring at the interface of two surfaces and how these phenomenon get affected by change in pressure and temperature.</li> <li>At the end of this course, the students will learn about chemical kinetics: the study of rate of reaction with proposed mechanism on a microscopic level. The students will understand the variation in reaction rate with change in temperature and concentration which will prove beneficial for them on industrial front as they will know the best way to produce the chemicals as fast as possible.</li> </ul>
BHC 303 (P)	Physical Chemistry-III Lab	The students will be made to practically analyse the theoretical concepts through various practical problems like determination of critical solution temperature and

		composition of two component system, effect of impurities on them, construction of phase diagrams using cooling curves, study of kinetics of reactions and verification of different adsorption isotherms.
BHC 305 A (P)	Skill Enhancement Course: Green Methods in Chemistry	Provides wide range of applications of green chemistry includes uses in the pharmaceutical industry, as well as new approach to eliminate or reduce the use of solvents or render them safer and more efficient.
BHC 305 B (P)	Skill Enhancement Course: Pesticide Chemistry	<ul style="list-style-type: none"> <li>• Pesticides application refers to the practical way in which pesticides including herbicides, fungicides, insecticides are delivered to biological targets.</li> </ul>
BHC 401	Inorganic Chemistry-III	<p>At the end of the course, the learners would be able to:</p> <ul style="list-style-type: none"> <li>• Identify the principles, structure and reactivity of selected coordination complexes Interpret their electronic spectra and magnetic properties.</li> <li>• To describe the shapes and structures of coordination complexes with coordination numbers ranging from 4 to 12.</li> <li>• To use Crystal Field Theory to understand the magnetic properties of coordination compounds.</li> <li>• To become familiar with some applications of coordination compounds.</li> <li>• Identify and understand the transition, Lanthanoids and Actinoids and their properties.</li> <li>• Understand the role and action of metals in biological system.</li> </ul>
BHC 401(P)	Inorganic Chemistry-III Lab	This course will train the students in the quantitative analysis of metal ions and anions using gravimetric method, chromatography techniques, inorganic preparations.

BHC 402	Organic Chemistry-III	<p>Upon completion of this Course the student would be able to:</p> <ul style="list-style-type: none"> <li>• Get an idea of preparation methods , properties and reactions of the nitrogen containing functional group such as amines , diazonium salts etc.</li> <li>• Learn the technique of synthesis of heterocyclic compounds used in synthesis of various drugs &amp; students will also get basic idea of properties and reactions of heterocyclic compounds .</li> <li>• Get to know the medicinal importance of various alkaloids &amp; learn the method of structure elucidation of terpenoids as these two are the very important organic chemicals available in different kind of drug and perfumery chemicals.</li> </ul>
BHC 402(P)	Organic Chemistry-III Lab	<ul style="list-style-type: none"> <li>• Impart students a knowledge about the chemistry of some selected functional groups with a view to develop proper aptitude toward the study of organic compounds and their reactions.</li> <li>• The technique of synthesis of heterocyclic compound is important in the synthesis of different drugs.This course gives the quantitative idea about the synthesis of heterocyclic compounds.</li> </ul>
BHC 403	Physical Chemistry-IV	<ul style="list-style-type: none"> <li>● Upon completion of this course, the students will learn to construct an electrochemical cell.</li> <li>● In addition to this, the students will understand how to measure the cell potential for an electrochemical cell and how to use this measured cell potential to calculate the free energy change, enthalpy change and entropy change.</li> </ul>

BHC 403(P)	Physical Chemistry-IV Lab	<ul style="list-style-type: none"> <li>• Students will be able to apply their knowledge for EMF measurements in determining (i) equilibrium constants and (ii) pH values using different electrodes.</li> <li>• Moreover, the course includes the study of potentiometric titrations of different acids and bases which has many applications in agriculture, medicine and food industry.</li> </ul>
BHC 405 A (P)	Basic Analytical Chemistry	Students get the knowledge in every aspect of the chemical industry, including catalysis, material sciences, fuels and agriculture.
BHC 405 B (P)	Fuel Chemistry	Students get the knowledge of broad range of renewable gasoline and diesel fuels ranging from currently available ethanol and biodiesel.
BHC 501	Organic Chemistry- IV	<p>After the completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• Get knowledge about the classification and biological role of carbohydrates, nucleic acids and Amino acids</li> <li>• Able to describe the different levels of protein structure and their interdependence.</li> <li>• Be familiar with the enzymes (biocatalysts), and their salient attributes including unique conformation and amazing catalytic properties.</li> <li>• Demonstrate an understanding of structure &amp; metabolism of macromolecules and also understand the regulation and disorders of metabolic pathways.</li> </ul>

BHC 501 (P)	Organic Chemistry- IV Lab	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Apply various methods for the estimation and analysis of carbohydrates, amino acids and protein.</li> <li>• Compare the average fatty acid chain length by determining their saponification value.</li> <li>• Understand that what are favourable optimum conditions for enzymatic activity of salivary amylase.</li> </ul>
BHC 502	Physical Chemistry-V	<p>After the completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand concepts of the fundamentals of quantum mechanics and its applications in the study of structure of atoms, bonding in molecules and molecular spectroscopy. Learn the basic concepts of photochemistry.</li> </ul>
BHC 502 (P)	Physical Chemistry-V Lab	<p>At the end of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>• Operate the Conductometer and Potentiometer for the redox titrations.</li> <li>• Apply the concepts of Beer-Lambert's law to different samples.</li> </ul>
BHC 503 A	Inorganic Materials of Industrial Importance	<p>After completion of this course the students will be able to</p> <ul style="list-style-type: none"> <li>• Learn the preparation of some industrial inorganic products and the challenges facing their production.</li> <li>• Emphasize on learning the importance of inorganic chemical industry, their economic impact, individual chemical processes and production challenges.</li> <li>• Develop creative thinking about how this industry can be improved by having knowledge of experimental factors.</li> </ul>

BHC 503 A (P)	Inorganic Materials of Industrial Importance Lab	<ul style="list-style-type: none"> <li>• Enable the students to analyse the binary mixtures of metallic ions by volumetric and gravimetric methods.</li> <li>• To acquire the skill to analyse some common alloys and ores.</li> </ul>
BHC 503 B	Novel Inorganic Solids	<p>After the completion of this course the students will be able to</p> <ul style="list-style-type: none"> <li>• Develop important processing skills of the engineering materials which will enhance lifelong learning.</li> <li>• Able to synthesise the nano particles specifically gold and silver NP's. Along by the end they will be familiar with the different methods used for the solid-state synthesis.</li> <li>• Understand the advantage of composite material over conventional material.</li> <li>• Learn the use of various engineering materials along with their properties in mechanical construction.</li> </ul>
BHC 503 B (P)	Novel Inorganic Solids Lab	<ul style="list-style-type: none"> <li>• Students will gain an understanding of top down and bottom up methods of nanomaterials preparation.</li> <li>• Knowledge of tools behind nanomaterials characterization.</li> <li>• Approaches to the development of chemical and biological sensors based on plasmonics, spintronics, nano porosity and issues related to their translation from the research laboratory to the clinic applications.</li> </ul>
BHC 504 A	Statistical Thermodynamics	<p>On the completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>• Give an account on the macroscopic and microscopic description of entropy and free energy in terms of thermodynamic probability.</li> <li>• Give an account on the theory of statistical mechanics to construct the microscopic models for gases and crystals.</li> <li>• Describe transport phenomenon.</li> </ul>

BHC 504 A (P)	Physical Chemistry Lab	<p>After the completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>• Find out reaction rates and the various factors affecting the reaction rates.</li> <li>• Find out the molar refractivity, density and coefficient of expansion etc.</li> </ul>
BHC 504 B	Dissertation	<ul style="list-style-type: none"> <li>• Students will learn to demonstrate knowledge of research processes.</li> <li>• Students will be able to identify, explain, compare and prepare the key elements of a research proposal.</li> <li>• Students can describe sampling methods, measurement scales and instruments and appropriate uses of each.</li> <li>• Students will critically analyse and evaluate the knowledge and understanding in relation to the agreed area of study.</li> <li>• It enable the participants to develop knowledge and understanding of a specialist area within broad fields of career development.</li> <li>• Students will be able to develop responses on the basis of evaluation and analysis undertaken.</li> </ul>
BHC 601	Inorganic Chemistry- IV	<p>After the completion of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Explain and rationalize the inorganic reaction mechanisms of square planar and octahedral complexes.</li> <li>• Knowledge about organometallic chemistry, knows the classes of ligand, metal carbonyl compounds and metal clusters.</li> <li>• Explain and rationalize industrially important catalytic processes through the application of organometallic principles.</li> </ul>

BHC 601(P)	Inorganic Chemistry- IV Lab	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Apply this knowledge for qualitative analysis of mixtures of acid/basic radicals by Semi micro method.</li> <li>• Understand and Operate the UV-Visible spectrophotometer for metal-ligand complexation study.</li> </ul>
BHC 602	Organic Chemistry-V	<p>After the completion of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the basic principles of the following spectroscopic techniques: UV/Vis, IR and proton NMR spectroscopy.</li> <li>• Explain how the above-named techniques can be used to distinguish between and / or identify simple organic compounds.</li> <li>• Solve problems concerning the elucidation of the structure of simple organic compounds.</li> </ul>
BHC 602(P)	Organic Chemistry-V Lab	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• Gain the skill to prepare organic compounds using greener protocols. Prepare organic compounds via two step synthetic sequences.</li> </ul>
BHC 603(A)	Polymer Chemistry	<p>After the completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• Indicate how the properties of polymeric materials can be exploited by a product designer.</li> <li>• Identify the repeat units of particular polymers and specify the isomeric structures which can exist for those repeat units.</li> <li>• Estimate the number- and weight-average molecular masses of polymer samples given the degree of polymerisation and mass fraction of chains present.</li> </ul>

BHC 603(A)(P)	Polymer Chemistry Lab	<p>After the completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• To Know the methods of preparation of different polymers.</li> <li>• Indicate how the properties of polymeric materials can be exploited by a product designer.</li> <li>• Estimate the number- and weight-average molecular masses of polymer samples given the degree of polymerisation and mass fraction of chains present.</li> </ul>
BHC 603(B)	Advanced Inorganic Chemistry	<p>After the completion of this course students will be able to:</p> <ul style="list-style-type: none"> <li>• Apply The concepts of symmetry and group theory in solving chemical structure problems.</li> <li>• Understand the concept of Spin-orbital coupling in <math>p^n</math> and <math>d^n</math> configurations and calculate the term symbol.</li> <li>• Analyse the electronic spectra and also understand the magnetic behaviour using Gouy's methods of determining magnetic susceptibility of transition metal complexes.</li> </ul>
BHC 603(B)(P)	Advanced Inorganic Chemistry Lab	<ul style="list-style-type: none"> <li>• To be able to synthesize and analyse the co-ordination complexes and its bonding.</li> <li>• The students will be able to use the chromatographic methods for separation of anions and cations.</li> </ul>
BHC 604(A)	Analytical Methods in Chemistry	<p>After the completion of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>4. Understand the fundamental laws and selection rules of spectroscopy including UV-Visible, Infrared and atomic absorption spectroscopy.</li> <li>5. learn the experimental skills on thermal and electroanalytical methods for different applications.</li> <li>6. Develop an understanding of the role of the chemist in measurement and problem</li> </ol>

		<p>solving in chemical analysis.</p> <p>Understand and skills in advanced methods of separation and analysis.</p>
BHC 604(A)(P)	Analytical Methods in Chemistry Lab	<p>After the completion of this course students will be able to:</p> <ol style="list-style-type: none"> <li>7. To develop an understanding of the role of the chemist in measurement and problem solving in chemical analysis.</li> <li>8. To have work experience of handling Spectro-photometric analysis</li> <li>9. To provide an understanding of and skills in advanced methods of separation and analysis.</li> </ol>
BHC 604(B)	Solid State And Radiation Chemistry	<p>On the completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>• Describe the specific crystal structures by applying basic crystallographic concepts</li> <li>• Give an account of generation of X-ray radiation and its effects on matter.</li> <li>• To characterize the structure parameter and relate the diffraction intensities mathematically.</li> <li>• Understand the basic concepts of laser and maser.</li> </ul>

BHC 604(B)(P)	Physical Chemistry Lab	<p>On the completion of this course, the students will be able to</p> <ul style="list-style-type: none"> <li>• Construction of the phase diagrams in three component system.</li> <li>• Acquaint knowledge and handling of conductometer and spectrophotometer.</li> <li>• Understand and develop skills in methods of separation and analysis.</li> </ul>
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## **The Program Specific Outcomes and Course Outcomes of all the Programmes**

### **Program Name: B.Sc Non Medical/CSM Computer Science (2018-19)**

#### B.Sc CSM

#### PROGRAM OUTCOMES:

After the successful completion of this course students will be able

PO 1: To apply critical thinking skills to solve problems that can be modeled mathematically,

PO2: To critically interpret numerical and graphical data, to read and construct mathematical arguments and proofs,

PO 3: To use computer technology appropriately to solve problems and to apply mathematical knowledge to a career related to mathematical sciences or in post - baccalaureate studies.

PO5: They will be able to understand and apply the fundamental principles, concepts and methods of statistics in key areas of science and multidisciplinary fields.

PO 6: Demonstrate problem solving, analytical and logical skills to provide solutions for the scientific requirements.

PO 7: Apply theoretical concepts to design experiments and develop programs.

#### PROGRAM EDUCATIONAL OBJECTIVES(CSM)

PEO 1. To provide graduates with a solid foundation in computer science, mathematics, and Statistics which will allow them to successfully pursue post graduate studies in computer science, mathematics, statistics or other related degrees.

PEO 2. Allow them to successfully compete for quality jobs in all functions of computer science, ranging from software developer to customer support, or mathematics teacher

PEO 3. To equip graduates with life-long learning skills, which will allow them to successfully adapt to the evolving technologies throughout their professional careers.

PEO 4. To equip graduates with communication skills, which will allow them to collaborate effectively with other members of a team.

PEO 5. To provide graduates with the broad education necessary to understand the impact of computer technology in a global and societal context.

**PROGRAM SPECIFIC OUTCOMES:**

PSO 1: B.Sc. graduates apply their broad knowledge of science across a range of fields, with in-depth knowledge in at least one area of study, while demonstrating an understanding of the local and global contexts in which science is practiced.

PSO 2 The main objective of this course is to cultivate statistical thinking among students by acquainting them with various statistical methods and their applications in different fields. PO 3 The courses give them in-depth knowledge in theoretical aspects of the subject

PSO 4 : the students are exposed to the application of the subject in various fields like industry, agriculture and population studies.

PSO 5: Also, the students are trained in using software packages for data analysis.

**Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
BSCSM1	<b>Computer Fundamental</b>	<ol style="list-style-type: none"><li>1. To understand the basics of computer system, its architecture Networks.</li><li>2. To understand the basic concepts, terminology of IT and familiar with the use of IT tools.</li><li>3. To Learn and explore new IT techniques in various applications and to identify the issues related to security.</li><li>4. To learn basic of word processing ,spreadsheet and presentation.</li><li>5. To be able to access the Internet, and internet application</li></ol>

<b>BSCSM-2</b>	<b>Computer Programming using C</b>	<ol style="list-style-type: none"> <li>1. Learn how to draw flowcharts and write algorithm/pseudocode.</li> <li>2. Learn, how to compile and debug programs in C language, use different data types, operators and console I/O function in a computer program.</li> <li>3. Design programs involving decision control statements, loop control statements, case control structures, arrays, strings, pointers, functions and implement the dynamics of memory by the use of pointers</li> </ol>
<b>BSCSM-3:</b>	<b>Data Structure</b>	<ol style="list-style-type: none"> <li>1. Implement the basic data structures and solve problems using fundamental algorithms.</li> <li>2. Implement various search and sorting techniques.</li> <li>3. Find the complexity of algorithms, to provide justification for that selection, and to implement the algorithm in a particular context.</li> <li>4.To understand the abstract data types stack, queue, deque, and list.To understand prefix, infix, and postfix expression formats</li> </ol>
<b>BSCSM-4</b>	<b>Database Management systems</b>	<ol style="list-style-type: none"> <li>1. To understand the different issues involved in the design and implementation of a database system.</li> <li>2. To study the physical and logical database designs, database modeling, relational, hierarchical, and network models.</li> <li>3. Analyze Database design using E-R data model by identifying entities, attributes, relationships, generalization and specialization along with relational</li> </ol>

		<p>algebra.</p> <p>4. Use data manipulation language to query, update, and manage a database the given real world problem</p> <p>5. Use of SQL and PL/SQL to implementation database applications with usage of DDL aspect of SQL, DML aspect of SQL.</p>
<b>BSCSM (DSE-1)</b>	<b>Operating System:</b>	<p>1. Explain basic operating system concepts such as overall architecture, interrupts, APIs, user mode and kernel mode.</p> <p>2. Distinguish concepts related to concurrency including, synchronization primitives, race conditions, critical sections and multi-threading. segmentation, virtual memory, and thrashing.</p> <p>5. Understand concepts such as file systems, security, protection, virtualization and device-management, disk-scheduling algorithms and various file systems.</p> <p>6. Use basic Linux commands and shell programming.</p> <p>3. Learn and apply CPU scheduling algorithms, deadlock detection and prevention algorithms.</p> <p>4. Examine and categorise various memory management techniques like caching, paging,</p>
<b>BSCSM (DSE-2)</b>	<b>Software Engineering:</b>	<p>1. Analyze software development process models, including agile models and traditional models like waterfall.</p> <p>2. Demonstrate the use of software life cycle through requirements gathering, choice of process model and design model.</p> <p>3. Use various UML Models for software analysis, design and testing.</p>

		<p>4. Acquire knowledge about the concepts of application of formal specification, CASE tools and configuration management for software development.</p> <p>5. Analysis of software estimation techniques for creating project baselines.</p>
<b>BSCSM (SEC – 1)</b>	<b>Web Designing:</b>	<p>1. Implement interactive web page(s) using HTML, CSS and JavaScript.</p> <p>2. Design a responsive web site using HTML5 and CSS3.</p> <p>3. Demonstrate Rich Internet Application.</p>
<b>BSCSM(SEC – 2 )</b>	<b>PHP Programming:</b>	<p>1. Test and debug a PHP application, Use cookies and sessions, Work with regular expressions, handle exceptions and validate data.</p> <p>2. Build Dynamic web site using server side PHP Programming and Database connectivity.</p> <p>3. Describe and differentiate different Web Extensions and Web Services.</p> <p>4. Demonstrate web application using PHP.</p>
<b>BSCSM(SEC – 3 )</b>	<b>Object Oriented Programming using C++</b>	<p>1. Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.</p> <p>2. Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.</p>

<b>BSCSM (SEC – 4 )</b>	<b>Visual Programming:</b>	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)</li> <li>2. Develop a Graphical User Interface (GUI) based on problem description</li> <li>3. Develop programs that retrieve input from a file as opposed to input only provided by user</li> </ol>
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### **The Program Specific Outcomes and Course Outcomes**

**Program Name: Bachelor of Computer Application (BCA)(2019-20)**

Program Educational Objectives (PEO)

**Program Name: - BACHELOR OF COMPUTER APPLICATIONS**

Program Code: - BCA

The Program aims are

**PEO 1:** To equip students with knowledge about various areas of computer.

**PEO 2:** To provide student with an academic atmosphere that raises excellence, transparency, leadership and  
promote awareness of life-long learning.

**PEO 3:** To prepare students to succeed in employment/profession or to pursue postgraduate & research in

Computer Science and Computer Application discipline.

**PEO 4:** To equip with skills for solving complex real-world problems.

**PEO 5:** To improve overall personality and character with team spirit, professionalism, integrity, and moral

values with the support of humanities, social sciences and physical educational courses.

**PEO 6:** To prepare the students to meet the requirement of Corporate world and Industry standard.

**PEO 7:** To motivate students for pursue post graduate education in the fields of Information Technology and Computer Applications

**PEO 8:** To train the students about computing principles and business practices in software industries.

### Program Outcomes (PO) For Under Graduate Program

Program Name: - BACHELOR OF COMPUTER APPLICATIONS

**Program Code: - BCA**

**After completing undergraduate program in Computer Application, a student will be able to**

**PO 1:** Recognize the need for and develop the ability to engage in continuous learning as a Computing professional.

**PO 2:** Pursue higher studies in the fields of Information Technology and Computer Applications

**PO 3:** Provide solutions to industry, society and business.

**PO 4 :** Start their own software startup.

**PO 5:** Ability to work as a member or leader in industries.

**PO 6:** Communicate effectively with the computing community as well as society.

**PO 7:** Understand economical, environmental, social, health, legal, ethical issues involved in the use of computer technology.

**PO 8:** Apply and commit professional ethics and cyber regulations in societies.

### Program Specific Outcomes (PSO)

**Program Name: - BACHELOR OF COMPUTER APPLICATIONS**

**Program Code: - BCA**

**PSO 1:** Explore technical understanding in varied areas of Computer Applications and experience a favorable environment in cultivating skills for booming career and higher studies.

**PSO 2:** To equip the student with understandability of algorithm and their application.

**PSO 3:** The program intends to train the students to become competent enough for entry level software developer.

**PSO 4:** Start from the basics and in every semester learns each and everything about computers.

**PSO 5:** Learn programming language such as Java, C++, HTML, SQL.

### Course Outcome:

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
	<b>Semester- I</b>	

BCA-101 E1	Workshop on Corel Draw	<ol style="list-style-type: none"> <li>1. Acquire practical proficiency in digital creativity.</li> <li>2. Learn how to use all program features for implementation of their own ideas and projects and for poster presentation of various semester projects</li> </ol>
BCA-101 E2	Workshop on Operating System (Linux)	<ol style="list-style-type: none"> <li>1. Learn the Linux computing environment.</li> <li>2. Get experience in using command-line utilities to navigate the file system, manage files and directories, and carry out basic file processing tasks.</li> </ol>
BCA-102	Communication Skills- I (Foundation Course)	<ol style="list-style-type: none"> <li>1. Develop and deliver effective communication.</li> <li>2. Write letters, applications, resume, notes etc. using Microsoft Word editor.</li> </ol>
BCA-103	Punjabi Compulsory /Punjabi(Mudhla Gyan)	<ol style="list-style-type: none"> <li>1. Understand elementary structure of Punjabi Language.</li> <li>2. Emphasize on speaking and reading skills in Punjabi.</li> </ol>
BCA-104	Fundamentals of Information Technology	<ol style="list-style-type: none"> <li>1. Convert between different number systems and describe some different codes.</li> <li>2. Understand the basics of computer , its organization, Input/Output devices etc.</li> </ol>
BCA-105	Web Designing using HTML and DHTML	<ol style="list-style-type: none"> <li>1. Understand the basic elements of web page development.</li> <li>2. Gain good knowledge of what a Web site is, including the latest developments in the field and learn the method of creating a</li> </ol>

		functional Web site
BCA-106	Software Lab- I (OSCLI, OFFICE)	<ol style="list-style-type: none"> <li>1. Facilitate and learn to use open source software.</li> <li>2. Get hands on practice on libre / open office that facilitates them to create documents, spreadsheet and effective presentations.</li> </ol>
BCA-107	Software Lab- II (Based on BCA-105)	<p>Implement the basic elements of web page development.</p> <ol style="list-style-type: none"> <li>2. Create a Web site using the latest developments in the field and creating a functional Web site .</li> </ol>
	<b>Semester- II</b>	
BCA-201 E1	Digital Electronics	<ol style="list-style-type: none"> <li>1. Introduce fundamental concepts underlying the digital electronics.</li> <li>2. Familiarize students the Number System, Boolean Algebra, logic Gates, design, basic structure and behaviour of the various functional modules of the computer.</li> </ol>
BCA-201 E2	Workshop on Networking & Hardware	<ol style="list-style-type: none"> <li>1. Introduce the concept of Computer Hardware.</li> <li>2. Discuss the Input and Output Devices and describe network system.</li> </ol>

BCA-202 F1	Workshop on Communication Skills- II	<ol style="list-style-type: none"> <li>1. Demonstrate critical and innovative thinking.</li> <li>2. Display competence in oral, written, and visual communication.</li> </ol>
BCA-202 F2	Workshop on Accounting	Students will be able to demonstrate knowledge of preparation of Financial Statements and or financial schedules in accordance with Generally Accepted Accounting Principles through analysis and synthesis of information as well.
BCA-203	Punjabi Compulsory/ Punjabi (Mudhla Gyan)	<ol style="list-style-type: none"> <li>1. Understand elementary structure of Punjabi Language.</li> <li>2. Emphasize on speaking and reading skills in Punjabi.</li> </ol>
BCA-204	Programming Fundamentals using C	<ol style="list-style-type: none"> <li>1. Enable the students to solve the problems using programming technique and to implement these programming techniques to create software.</li> <li>2. Enable the students to analyze the real life problems and write a program in C language to solve the problem.</li> </ol>
BCA-205	Database Management System	<ol style="list-style-type: none"> <li>1. Provide basic introduction to database system technologies.</li> <li>2. Form the basic conceptual background necessary to design and develop simple database systems.</li> </ol>
BCA-206	Software Lab- III (Based on Paper BCA-204)	<ol style="list-style-type: none"> <li>1. Supplement what is learnt under paper BCA-204: Programming in C.</li> <li>2. Implement programs in C.</li> </ol>

BCA-207	Software Lab- IV (Based on Paper BCA-205)	<ol style="list-style-type: none"> <li>1. Implement the concepts of creating tables and fetching the data using queries.</li> <li>2. Understand the concepts of keys.</li> <li>3. Understand Feature, Designing Database, Relationship (One to One, One to Many, Many to One, Many to Many)</li> </ol>
	<b>Semester- III</b>	
BCA-301 E1	Linux Administration	<ol style="list-style-type: none"> <li>1. Familiarize Students with Linux environment.</li> <li>2. Learn the fundamentals of Shell Scripting programming and Control the resources with various commands.</li> </ol>
BCA-301 E2	Multimedia	<ol style="list-style-type: none"> <li>1. Provide the basic understanding of multimedia systems</li> <li>2. Demonstrate the use of animation, digitized sound, video control, and scanned images</li> <li>3. Describe and understand the technical details of JPEG and MPEG families.</li> </ol>
BCA-302 F1	E-Commerce	<ol style="list-style-type: none"> <li>1. Acquire general understanding of basic business management concepts.</li> <li>2. Describe Internet trading relationship.</li> </ol> <p>Discuss legal issues and privacy</p>
BCA-302 F2	Fundamentals of Accounting	<ol style="list-style-type: none"> <li>1. . This course provides an orientation in the field of accounting and basic accounting fundamentals.</li> <li>1. After completion of this course, candidates would be able to record and</li> </ol>

		post transactions in the basic accounting equation and maintain subsidiary ledgers.
BCA-303	Computer Networks	<ol style="list-style-type: none"> <li>1. Build an understanding of the fundamental concepts of computer networking</li> <li>2. Familiarize the basic terminology of computer networking area.</li> <li>3. Introduce the advanced networking concepts.</li> </ol>
BCA-304	Programming using C++	<ol style="list-style-type: none"> <li>1. Understand how C++ improves C with object-oriented features.</li> <li>2. Learn the syntax and semantics of the C++ programming language</li> </ol>
BCA-305	Data Structure	<ol style="list-style-type: none"> <li>1. Have a comprehensive knowledge of the data structures and algorithms on which file structures and data bases are based.</li> <li>2. Understand the writing algorithms and step by step approach in solving problems with the help of fundamental data structures.</li> </ol>
BCA-306	Software Lab- V (Based on Paper BCA-304)	<ol style="list-style-type: none"> <li>1. To learn how to design C++ classes for code reuse.</li> <li>2. To learn how to implement copy constructors and class member functions.</li> <li>3. To learn how inheritance and virtual functions implement dynamic binding with polymorphism.</li> </ol>

BCA-307	Software Lab- VI (Based on Paper BCA-305)	<ol style="list-style-type: none"> <li>1. To develop skills to design programs for linear and non linear <i>data structures</i>.</li> <li>2. To Strengthen the ability to identify and apply the suitable <i>data structure</i> for the given real world problem.</li> <li>3. To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures.</li> </ol>
	<b>Semester- IV</b>	
BCA-401 E1	Digital Electronics	<ol style="list-style-type: none"> <li>3. Introduce fundamental concepts underlying the digital electronics.</li> <li>4. Familiarize students the Number System, Boolean Algebra, logic Gates, design, basic structure and behaviour of the various functional modules of the computer.</li> </ol>
BCA-401 E2	Microprocessors	<ol style="list-style-type: none"> <li>1. Introduce the basic concepts of microprocessor</li> <li>2. Introduce 8085 architecture and programming in assembly language.</li> <li>3. Introduce basic concepts of interfacing memory and peripheral devices to a microprocessor.</li> </ol>
BCA-402 F1	Mathematics	<ol style="list-style-type: none"> <li>1. Provide the knowledge of Ma trice solving, Set Theory and methods to solve series of numbers.</li> <li>2. Learn series operations.</li> <li>3. Learn various Trigonometric</li> </ol>

		functions.
BCA-402 F2	Statistical Methods	<ol style="list-style-type: none"> <li>1. To understand the basic principles of Statistical inference.</li> <li>2. To learn the language and core concepts of the statistical theory.</li> </ol>
BCA-403	Programming using Python	<ol style="list-style-type: none"> <li>1. The contents learnt under this course will enable students to learn a new programming language which has high demand in industry.</li> <li>2. Students are expected to use Dictionary, Functions in effective manner in order to create a reliable and user friendly application.</li> </ol>
BCA-404	Programming in JAVA	<ol style="list-style-type: none"> <li>1. Understand fundamentals of programming such as variables, conditional and iterative execution, methods, etc.</li> <li>2. Understand fundamentals of object-oriented programming in Java.</li> <li>3. Define classes, invoking methods, using class libraries etc</li> </ol>
BCA-405	Environment and Road Safety Awareness	<ol style="list-style-type: none"> <li>1. Creating the awareness about environmental problems among people.</li> <li>2. Imparting basic knowledge about the environment and its allied problems.</li> <li>3. Developing an attitude of concern for the environment.</li> </ol>

BCA-406	Quantitative and Logical Aptitude	<ol style="list-style-type: none"> <li>1. Apply Logical reasoning and mathematical analysis methodologies to understand and solve problems.</li> <li>2. Enhance the skills of computations and aptitude.</li> </ol>
BCA-407-	BCA-407- Software Lab- VII (Based on BCA-404)	<ol style="list-style-type: none"> <li>1. To have the ability to write a computer program to solve specified problems.</li> <li>2. To implemented concepts of object-oriented programming in Java.</li> <li>3. To be able to use the Java SDK environment to create, debug and run simple Java programs.</li> </ol>
	<b>Semester- V</b>	
BCA-501 E1	Relational Database Management System	<ol style="list-style-type: none"> <li>1. 1. To understand basic database concepts, including the structure and operation of the relational data model.</li> <li>2. 2. To construct simple and moderately advanced database queries using Structured Query Language (SQL).</li> <li>3. 3. It prepares the student to be in a position to use and design databases for different applications.</li> </ol>
BCA-501 E2	Multimedia	<ol style="list-style-type: none"> <li>1. To provide students with a basic understanding of multimedia systems</li> <li>2. To demonstrate the use of animation, digitized sound, video control, and scanned images</li> <li>3. Describe and understand the technical details of JPEG and MPEG families.</li> </ol>

BCA-502 F1	Artificial Intelligence	<ol style="list-style-type: none"> <li>1. To impart basic proficiency in representing difficult real life problems in a state space representation so as to solve them using AI techniques like searching and game playing.</li> <li>2. To create an understanding of the basic issues of knowledge representation and Logic as well as an understanding of other topics that play an important role in AI programs.</li> </ol>
BCA-502 F2	System Software	<ol style="list-style-type: none"> <li>1. Distinguish between Operating Systems software and Application Systems software.</li> <li>2. To learn context free grammars, compiler parsing techniques.</li> <li>3. To understand the theory and practice of compiler implementation.</li> </ol>
BCA-503	Operating System	<ol style="list-style-type: none"> <li>1. Learn the fundamentals of Operating Systems.</li> <li>2. Learn the mechanisms involved in memory management in contemporary OS.</li> </ol>
BCA-504-	Software Engineering	<ol style="list-style-type: none"> <li>1. Get Knowledge of basic Software engineering methods and practices and their appropriate application.</li> <li>2. Describe software engineering layered technology and Process frame work.</li> <li>3. A general understanding of software process models such as the waterfall and evolutionary models.</li> </ol>
BCA-505	Web Designing using ASP .NET	<ol style="list-style-type: none"> <li>1. Provide students with the tools and techniques to build dynamic Web sites using the ASP.Net programming environment.</li> <li>2. Develop a data driven web application.</li> <li>3. Understand the fundamentals of</li> </ol>

		developing modular application by using object oriented methodologies.
BCA-506	Software Lab- IX (Linux Administration)	<ol style="list-style-type: none"> <li>1. Learn the Linux computing environment.</li> <li>2. Get experience in using command-line utilities to navigate the file system, manage files and directories, and carry out basic file processing tasks.</li> </ol>
BCA-507	Software Lab- X (Based on Paper BCA-505)	<ol style="list-style-type: none"> <li>1. Design web applications using ASP.NET</li> <li>2. Use ASP.NET controls in web applications.</li> <li>3. Debug and deploy ASP.NET web applications</li> </ol>
	<b>Semester- VI</b>	
BCA-601 E1	Personality Development	<ol style="list-style-type: none"> <li>1. Meet the specific needs of our clients depending on their personal/organizational requirements.</li> <li>2. Encourage the students to build up their writing skills.</li> <li>3. Enhance the personality skills.</li> </ol>
BCA-601 E2	System Analysis & Design	<ol style="list-style-type: none"> <li>1. Introduce the overview of System Analysis &amp; design.</li> <li>2. Clear various business system concepts</li> </ol>

		3. Study the various system models.
BCA-602 F1	Content Management System	<ol style="list-style-type: none"> <li>1. To understand the different issues involved in the design and implementation of a database system.</li> <li>2. To study the physical and logical database designs, database modeling, relational, hierarchical, and network models</li> <li>3. To understand and use data manipulation language to query, update, and manage a database.</li> </ol>
BCA-602 F2	Data Warehouse	<ol style="list-style-type: none"> <li>1. The objective of this course is to get students familiar with the data mining techniques, software and tools being used in Industries.</li> </ol>
BCA-603	Computer Graphics	<ol style="list-style-type: none"> <li>1. Introduce students to all aspects of computer graphics including hardware, software and applications.</li> <li>2. Help students to apply graphics programming techniques to design, and create computer graphics.</li> </ol>
BCA-604	Web Development using PHP	<ol style="list-style-type: none"> <li>1. Gain the PHP Programming skills needed to successfully build interactive, data driven sites.</li> <li>2. Test and debug a PHP application</li> </ol>
BCA-605	Project	<ol style="list-style-type: none"> <li>1. Introduce the skills of dissertation writing.</li> <li>2. Provides a concrete description of the project's effect at the outcome level.</li> <li>3. Develop in a participatory process.</li> </ol>

BCA-606	Software Lab XI (Based on Found. Course)	1. Perform and implement the practical exercises to supplement what is learnt under paper BCA 602 F2.
BCA-607	Software Lab XII (Based on BCA-604)	1. Test and debug a PHP application 2. Use cookies and sessions 3. Work with regular expressions, handle exceptions and validate data.

## **The Program Specific Outcomes and Course Outcomes of all the Programmes**

### **Program Name: Bachelor of Vocational (Software Development) (BV(SD))(2019-20)**

#### **Program Educational Objectives (PEO)**

#### **Program Name: - BACHELOR OF VOCATION (SOFTWARE DEVELOPMENT)**

#### **Program Code:- BVSD**

The program aims are

**PEO 1:** To exhibit advanced skills in the effective design and implementation of business system utilizing contemporary information technology.

**PEO 2:** To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme

**PEO 3:** Understand analyze and develop computer programs in the areas related to software development.

**PEO 4:** To integrate NSQF within the undergraduate level of higher education in order to enhance employability of the graduates and meet industry requirements.

**PEO 5:** To develop conceptual knowledge and skill set required as per national occupational standards (NOS) of IT sector.

### Program Outcomes (PO) For Under Graduate Program

Program Name: - BACHELOR OF VOCATIONAL ( SOFTWARE DEVELOPMENT)

### Program Code: - BVSD

After completing Bachelor of Vocation program in Software development, a student will be able to:

**PO 1:** Become employable in various IT companies and government jobs.

**PO 2:** Possess strong foundation for their higher studies in the fields of Information Technology and Computer Applications.

**PO 3:** Develop practical skills to provide solutions to industry, society and business.

**PO 4:** Apply technical and professional skills to excel in business.

**PO 5:** Aims at imparting practical and industry relevant skill in the domain of computer science and software development.

**PO 6:** This would enable the graduates to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

## Program Specific Outcomes (PSO)

**Program Name: - BACHELOR OF VOCATIONAL ( SOFTWARE DEVELOPMENT)**

**Program Code: - BVSD**

**PSO 1:** To prepare the young professional for a range of computer applications, computer organization, techniques of computer networking, software engineering-Commerce, Web Designing, Big Data, IOT, Python and Advance JAVA.

**PSO 2:** To enhance programming skills of the young IT professionals through project development in each language/technology learnt during semester.

**PSO 3:** To produce employable IT workforce, that will have sound knowledge of IT and business fundamentals that can be applied to develop and customize solutions for Small and Medium Enterprises (SME).

**PSO 4:** To impart practical and industry relevant skill in the domain of computer science and software development.

**PSO 5:** The focus is more on imparting and emphasizing hands-on practical expertise rather than going for more inclination towards theoretical aspects.

### **Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
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	<b>Semester- I</b>	
BVSD-101 E1	- Digital Creativity using Adobe Photoshop	<p>1) Explore best practices for teaching and learning with digital media.</p> <p>2) Integrate creativity and digital media into a curriculum plan for the classroom.</p>
BVSD-101 E2-	Page Maker	<p>1) To provide basic skills in page maker.</p> <p>2) By the end of the course students will be capable to edit and create pages using features and tools of page maker</p>
BVSD-102	- Punjabi Compulsory/ Punjabi(Mudhla Gyan)	<p>The main purpose of this course is to equip the students with the nuances of the Punjabi language</p> <p>which includes proficiency in grammar and its effective usage in speaking and writing</p>
BVSD-103	- Fundamentals of Computer	<p>1) This course offers a good understanding of the various functional units of a computer system.</p> <p>2) The students are also exposed to the recent trends in information technology.</p>
BVSD-104	- Programming Fundamentals	<p>1) To enable the students to solve the problems using programming technique and to implement these programming techniques to create software.</p> <p>2) This course will enable the students to analyze the real life problems and write a</p>

		<p>program in C</p> <p>language to solve the problem. The main emphasis of the course will be on problem solving aspect.</p>
BVSD-105 F1	- Communication Skills- I	<p>1)Increased understanding of the meaning of communication and its importance in all spheres of life</p> <p>2)Better understanding of the importance of spoken communication and how to become a good speaker in group as well as individually; improving interpersonal communication. Increased attention span as a listener.</p>
BVSD-106	- Software Lab- I(Open Office)	<p>1) To facilitate the students to use open source software.</p> <p>2) To give hands on practice on libre / open office.</p>
BVSD-107-	Software Lab- II(Based on BVSD-104)	<p>1) To enable the students to solve the problems using programming technique and to implement these programming techniques to create software.</p> <p>2) To provide the students hands on experience of “C” programming and to enhance their logical skills.</p>
	<b>Semester- II</b>	

BVSD-201 E1	- E-Commerce	<p>1) Understand the value chain including the information, negotiation, and processing phase of electronic business transactions</p> <p>2) Know the characteristics of customer relationship management and online marketing</p>
BVSD-201 E2	- System Analysis & Design	<p>1) The course has been designed to provide a solid foundation of systems principles</p> <p>2) To provide understanding of how business function, while heightening students to the issues the analysts face daily.</p>
BVSD-202 F1	-Workshop on Communication Skills-II	<p>1) To provide employability skills</p> <p>2) To know the process of Interview Techniques and Group discussion.</p> <p>3) To understand the needs and benefits of written communication.</p>
BVSD-202 F2	Workshop on Corel Draw	<p>1) The objective of the course is to provide basic skills in CorelDraw.</p> <p>2) By the end of the course a student will be capable to edit images and create documents using the features and tools available in Photoshop and Corel Draw.</p>
BVSD-203	Data Base Management System	<p>1) To provide basic introduction to database system technologies.</p> <p>2) To form the basic conceptual background necessary to design and develop simple database systems.</p>

BVSD-204-	Operating System	<p>1) To introduce students with basic concepts of Operating System, its functions and services.</p> <p>2) To familiarize the students with various views and management policies adopted by O.S. as</p> <p>pertaining with processes , Deadlock , memory , File and I/O operations</p>
BVSD-205-	Programming using C++	<p>1) To learn advanced features of the C++ programming language as a continuation of the</p> <p>previous course.</p> <p>2)To learn the characteristics of an object-oriented programming language: data abstraction and</p> <p>information hiding, inheritance, and dynamic binding of the messages to the methods.</p>
BVSD-206-	Software Lab- III (Based on Paper BVSD-203)	<p>1) This lab provides a strong formal foundation in database concepts, technology and practice.</p> <p>2) To present the concepts and techniques relating to query processing by SQL engines.</p>

BVSD-207-	Software Lab- IV (Based on Paper BVSD-205)	<p>1) To learn advanced features of the C++ programming language as a continuation of the previous course.</p> <p>2) To learn the characteristics of an object-oriented programming language: data abstraction and information hiding, inheritance, and dynamic binding of the messages to the methods.</p>
	<b>Semester- III</b>	
BVSD-301 E1	- Software Engineering	<p>1) This course introduces the concepts and methods required for the construction of large software intensive systems.</p> <p>2) Prepares students to be in a position to develop error free and quality software.</p> <p>3) It aims to develop a broad understanding of the discipline of software engineering.</p>
BVSD-301 E2	- Management Information System	<p>1) This course helps to evaluate the role of the major types of information systems in a business environment and their relationship to each other;</p> <p>2) It offers a good understanding of the</p>

		<p>concepts and methods of decision making.</p> <p>3) Identify the major management challenges to building and using information systems and</p> <p>learn how to find appropriate solutions to those challenges;</p>
BVSD-302 F1	- Communication Skills-III	<p>1) To provide employability skills</p> <p>2) To know the process of Interview Techniques &amp; Group discussion.</p> <p>3) To understand the needs and benefits of written communication.</p>
BVSD-302 F2-	Fundamentals of Hardware & Networking	<p>1) This course offers a good understanding of the fundamentals of Computer and Organization of Hardware and Software.</p> <p>2) Preparing students to know how to troubleshoot Computer and Networks.</p> <p>3) To clear Compressing and Encrypting File concepts.</p>
BVSD-303	- Web Designing using HTML & DHTML	<p>1) To develop the skill &amp; knowledge of Web page design.</p> <p>2) To understand the basics of creating dynamic web pages.</p>
BVSD-304-	Environment Studies	<p>Upon successful completion of the course, students should be able to:</p> <p>1) Propose solutions to environmental problems related to resource use and management</p>

		<p>2) Interpret the results of scientific studies of environmental problems</p> <p>3) Describe threats to global biodiversity, their implications and potential solutions</p>
BVSD-305	- Data Structure	<p>1) This course provides the students with concept of the fundamentals of different types of data structures and also the ways to implement them.</p> <p>2) To introduce various techniques for representation of the data in the real world.</p> <p>3) To develop application using data structures.</p> <p>4) To teach the concept of protection and management of data.</p>
BVSD-306	- Quantitative & Logical Aptitude	<p>1) This course provide the students with an understanding of deductive and inductive reasoning</p> <p>2) To make students understand both Verbal and Non Verbal Reasoning.</p> <p>3) To practise various quantitative aptitude question.</p>
BVSD-307	- Software Lab- I (Based on BVSD-303)	<p>1) To develop the skill &amp; knowledge of Website design.</p> <p>2) To understand the basics of creating dynamic web pages.</p>

BVSD-308-	Software Lab- II (Based on BVSD-305)	<p>1) This course provide the students with concept of the fundamentals of different types of data structures and also the ways to implement them.</p> <p>2) To introduce various techniques for representation of the data in the real world.</p> <p>3) To develop application using data structures.</p> <p>4) To teach the concept of protection and management of data.</p>
	<b>Semester- IV</b>	
BVSD-401	- Elective- IV (AECC)	
BVSD-401 E1	- Computer Networks	<p>1) This course provides knowledge about computer network related hardware and software using a layered architecture.</p> <p>2) Understand state-of-the-art in network protocols, architectures, and applications</p> <p>3) To understand the functioning of different Layers of OSI and TCP/IP model.</p>

BVSD-401 E2-	System Software	<p>1) To have an understanding of the functionality of different types of system software.</p> <p>2) To understand the basics of software tools.</p>
BVSD-402	- Foudation- IV (GE)	
BVSD-402 F1-	Commuication Skills-IV	<p>1) To provide employability skills</p> <p>2) To know the process of Interview Techniques &amp; Group discussion.</p> <p>3) To understand the needs and benefits of written communication.</p>
BVSD-402 F2	- Content Management System	<p>1) This course is designed to give students a practical knowledge about the web content management environments.</p> <p>2) The course will introduce the student both to the applied aspects of content management technologies but also to the theoretical issues involved.</p> <p>3) Students will get knowledge of various CMS tools.</p>
BVSD-403-	Software Testing-Concepts and Tools	<p>1) Understand the fundamental concepts and theory of Software testing and Software Quality Management</p> <p>2) To describe strategies for generating</p>

		<p>system test cases.</p> <p>3) To understand the essential characteristics of tools used for test automation</p>
BVSD-404	- Mathematics	<p>1) Apply knowledge of computing and mathematics appropriate to the discipline.</p> <p>2) Analyze a problem and identify and define the computing requirements to solution.</p> <p>3) Understand some aspects of computer programming.</p> <p>4) Understand the concepts of algorithms.</p>
BVSD-405-	Programming With Java	<p>1) This course will teach the basic concepts and techniques which form the object oriented programming paradigm.</p> <p>2) Prepare students to be in a position to write object oriented programs using Java.</p> <p>3) To build an application using user Interface Components, JDBC.</p>
BVSD-406-	Software Lab- VII (Based on BVSD-403)	<p>1) This course will enable students to prepare Test Plan and Test cases.</p> <p>2) Students will learn various testing techniques</p> <p>3) Understand the working of various Automated Testing Software</p>

BVSD-407-	Software Lab- VIII (Based on BVSD-405)	<p>1) This course will teach the implementation of basic concepts and techniques which form the object oriented programming paradigm.</p> <p>2) Prepare students to be in a position to write object oriented programs using Java.</p> <p>3) To build an application using user Interface Components, JDBC.</p>
	<b>Semester- V</b>	
BVSD-501 E1-	Relational Database Management System	<p>1) To understand basic database concepts, including the structure and operation of the relational data model.</p> <p>2) To construct simple and moderately advanced database queries using Structured Query Language (SQL).</p> <p>3) It prepares the student to be in a position to use and design databases for different applications.</p>
BVSD-501 E2	- CSA	<p>1) The course is intended to give students a good understanding of internal architectural details.</p> <p>2) To provide essential understanding of different subsystems of modern computer</p>

		<p>system and design aspects these subsystems.</p>
BVSD-502 F1	Presentation Skills and Personality Development	<p>1) Students learnt the latest trends in business letter writing , resume ad report writing.</p> <p>2) Learnt the unique characteristics of organizational communication and the various directional networks.</p> <p>3) Appreciation and analysis of the role of literature in our lives through discussion of prescribed novel and short stories. The values were also reinforced.</p>
BVSD-502 F2	- Workshop on Oracle	<p>1) This practical will enable students to retrieve data from relational databases using SQL.</p> <p>2) Students will also learn about triggers, cursors, stored procedures etc.</p>
BVSD-503	-Web Development using PHP	<p>1.Test and debug a PHP application,Use cookies and sessions,Work with regular expressions, handle exceptions and validate data.</p> <p>2. Build Dynamic web site using server side PHP Programming and Database connectivity.</p>

		<p>3. Describe and differentiate different Web Extensions and Web Services.</p> <p>4. Demonstrate web application using PHP</p>
BVSD-504	- Computer Graphics	<p>1) This course will introduce students to all aspects of computer graphics including hardware, software and applications.</p> <p>2) It will help students to apply graphics programming techniques to design, and create computer graphics.</p>
BVSD-505	.NET Technology	<p>1) This course will offer a detailed knowledge of web site development using .NET technology.</p> <p>2) Creating interactive applications using various controls.</p> <p>3) Develop a data driven web application.</p> <p>4) Connecting to data sources and managing them</p>
BVSD-506	- Software Lab- IX (Based on BVSD-503)	<p>1) Understand how server-side programming works on the web.</p> <p>2) Creating conditional structures</p> <p>3) Storing data in arrays</p>
BVSD-507-	Software Lab- X (Based on BVSD-505)	<p>1) Set up a programming environment for ASP.net programs.</p> <p>2) Configure an asp.net application.</p> <p>3) Creating ASP.Net applications using standard .net controls.</p>

		<p>4) Develop a data driven web application.</p> <p>5) Connecting to data sources and managing them</p>
	<b>Semester- VI</b>	
BVSD-601	- Project (6- Month Industrial Training)	<p>1) To master the art of working in group, and develop understanding of technical dissertation presentation and writing.</p> <p>2) To improve technical knowledge and state-of-the art practice related to the real-world problems.</p>

## **The Program Specific Outcomes and Course Outcomes of all the Programmes**

**Program Name: Master of Science -Information Techonology  
(M.Sc(IT))(2019-20)**

Program Educational Objectives (PEO)

**Program Name: - MASTER OF INFORMATION TECHNOLOGY**

Program Code: - MS

The Program aims are

**PEO 1:** Integrate fundamentals and advanced concepts of computer science and applications to develop with effective usage of software development methodologies.

**PEO 2:** Develop competency to be placed as per the current market trends and requirements.

**PEO 3:** Apply and continuously acquire knowledge, theoretical and applied, related to core areas of computer science.

**PEO 4:** Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment.

**PEO 5:** Engage in life-long learning, to remain current in their profession and obtain additional qualifications to enhance their career positions in IT industries.

Program Outcomes (PO) Post Graduate Program (PG)

Program Name: - MASTER OF INFORMATION TECHNOLOGY

**Program Code: - MS**

At the end of the Master in Information Technology, Students will be able to

**PO 1:** Use software development tools, software systems, and modern computing platforms.

**PO 2:** Get some development experience within a specific field of Computer Science, through project work.

**PO 3:** Communicate computer science concepts, designs, and solutions effectively and professionally.

**PO 4:** Learn new technology, grasping the concepts and issues behind its use and the use of computers.

**PO 5:** Build up programming, analytical and logical thinking abilities.

### Program Specific Outcomes (PSO)

**Program Name: - MASTER OF INFORMATION TECHNOLOGY**

Program Code :- MS

**PSO 1:** Achieve expertise in various subjects from the broad area of Information technology.

**PSO 2:** Students understand all dimensions of the concepts of software application and projects.

**PSO 3:** Students understand the computer subjects with demonstration of all programming and theoretical concepts with the use of ICT.

**PSO 4:** Theoretical and Practical knowledge of Data Structure, Database Management System, Operating System, Object Oriented Programming in java , Computer Networks and Computer Programming using Python.

**PSO 5:** Interact with IT experts & knowledge by IT visits.

**PSO 6:** Assimilate professional ethics, managerial and soft skills to emerge as a leader to manage diverse projects in industry.

**PSO 7:** Apply domain expertise to pursue research in Computer science and Information Technology discipline.

**Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
	<b>Semester- I</b>	
MSIT 111	Fundamentals of Information Technology	To understand the basics of computer system, its architecture, number system and Networks.  To understand the basic concepts, terminology of IT and familiar with the applications of Internet.
MSIT 112	Programming Fundamentals using C Language	The objective of this paper is to familiarize the students with the core concepts of C Language and program development. To make the students aware of pointers, structure and file handling system using C Language.

MSIT 113	Operating Systems	To help students become familiar with the fundamental concepts of operating systems and provide students with sufficient understanding of operating system design.
MSIT 114-	Programming Lab I (Based on MS 112)	To familiarize the students with C language environment.To implement various concepts related to C language.
MSIT 115-	Programming Lab II (Based on web designing , HTML,and other scripting languages)	Develop skills in analysing the usability of a web site.Learn the language of the web: HTML, CSS and scripting.
MSIT 116 C1	- Workshop on Page Maker	The objective of the course is to provide basic skills in Page Maker.By the end of the course a student will be capable to edit and create documents using the features and tools available in Page Maker.
MSIT 116 C2	- Workshop on Corel Draw	The objective of the course is to provide basic skills in CorelDraw.  By the end of the course a student will be capable to edit images and create documents using the features and tools available in Corel Draw.
	<b>Semester- II</b>	
MSIT 121	- Object Oriented Programming using C++	To understand the difference between object oriented programming and procedural oriented language and data types in C++.To make the students able to program using C++ features such as composition of objects, Operator

		overloading, inheritance, Polymorphism etc.
MSIT 122	RDBMS and Oracle	<p>To describe data models and schemas in RDBMS</p> <p>To understand the features of database management systems and Relational database.</p> <p>To understand the functional dependencies and design of the database.</p> <p>To understand the concept of Transaction and Query processing.</p>
MSIT 123	E-Technologies	The objective of this paper is to familiarize the students with current E-Technology tools used in software industry.
MSIT 124-	Programming Lab III (Based on MS 121)	To familiarize the students with basics and object oriented concepts of C++ To implement various OO concepts related to language.
MSIT 125	- Programming Lab IV (Based on MS 122)	Understand the needs of database processing and learn techniques for controlling the consequences of concurrent data access.
MSIT 126 C1	Workshop on Visual Programming	The objective of this paper is to familiarize the students with concept of Visual programming Information Technology.

MSIT 126 C2	- Principles & Practices of Management	The objective of the course is to teach managerial skills to aspiring manager or the trained managers who want to become more effective. The subject also emphasis on conceptual and technical frameworks of leadership and the role of communication.
<b>Semester- III</b>		
MSIT 231	Computer Networks	The objective of this paper is to familiarize the students with concept of various Networking Techniques.
MSIT 232-	Programming in JAVA	The objective of this paper is to familiarize the students with concept of JAVA programming language.
MSIT 233-	Software Engineering	This paper is to familiarize the students with concept of software engineering and different approaches used in software industry for software development.
MSIT 234-	Programming Lab V (Based on MS 232)	The objective of this paper is to familiarize the students with concept of JAVA
MSIT 235-	Programming Lab VI (Based on Linux)	The objective of this paper is to familiarize the students with Basic Linux commands, Shell programming, Networking in Linux operating system.
MSIT 236 C1	Computer Graphics	The objective of this paper is to familiarize the students with concept various techniques related to Computer Graphics

MSIT 236 C2	Organizational Behaviour & Development	<p>1.To develop organizational skills among the students.</p> <p>2.Students will learn different motivation theories which will help to make them confident to solve problems effectively.</p>
	<b>Semester- IV</b>	
MSIT 241-	Artificial Intelligence	The objective of this paper is to familiarize the students with Significance of Artificial Intelligence in Computer Science field.
MSIT 242-	Data Structure	The objective of this paper is to familiarize the students with concept of data & file structures in Information Technology.
MSIT 243-	Web Development using PHP	The objective of this paper is to familiarize the students with concept of web development using PHP.
MSIT 244-	Programming Lab VII (based on MS242)	The objective of this paper is to implement concepts of data & file structures in Information Technology.
MSIT 245	Programming Lab VIII (based on MS243)	The objective of this paper is to implement concepts of web development using PHP.
MSIT 246 C1	MIS	The objective of this paper is to familiarize the students with Significance of MIS in Computer Science field.

MSIT 246 C2-	Software Testing	The objective of this paper is to familiarize the students with importance of Software Testing in Software Life Cycle and Engineering.
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## **The Program Specific Outcomes and Course Outcomes of all the Programmes**

### **Program Name: Master of Science -Information Technology (Lateral Entry) (M.Sc(IT-LE))(2019-20)**

#### **Program Educational Objectives (PEO)**

#### **Program Name: - MASTER OF INFORMATION TECHNOLOGY**

The Program aims are

**PEO 1:** Integrate fundamentals and advanced concepts of computer science and applications to develop with effective usage of software development methodologies.

**PEO 2:** Develop competency to be placed as per the current market trends and requirements.

**PEO 3:** Apply and continuously acquire knowledge, theoretical and applied, related to core areas of computer science.

**PEO 4:** Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment.

**PEO 5:** Engage in life-long learning, to remain current in their profession and obtain additional qualifications to enhance their career positions in IT industries.

### Program Outcomes (PO) Post Graduate Program (PG)

Program Name: - MASTER OF INFORMATION TECHNOLOGY

### Program Code: - MS

At the end of the Master in Information Technology, Students will be able to

**PO 1:** Use software development tools, software systems, and modern computing platforms.

**PO 2:** Get some development experience within a specific field of Computer Science, through project work.

**PO 3:** Communicate computer science concepts, designs, and solutions effectively and professionally.

**PO 4:** Learn new technology, grasping the concepts and issues behind its use and the use of computers.

**PO 5:** Build up programming, analytical and logical thinking abilities.

### Program Specific Outcomes (PSO)

Program Name: - MASTER OF INFORMATION TECHNOLOGY

**PSO 1:** Achieve expertise in various subjects from the broad area of Information technology.

**PSO 2:** Students understand all dimensions of the concepts of software application and projects.

**PSO 3:** Students understand the computer subjects with demonstration of all programming and theoretical concepts with the use of ICT.

**PSO 4:** Theoretical and Practical knowledge of Data Structure, Database Management System, Operating System, Object Oriented Programming in java , Computer Networks and Computer Programming using Python.

**PSO 5:** Interact with IT experts & knowledge by IT visits.

**PSO 6:** Assimilate professional ethics, managerial and soft skills to emerge as a leader to manage diverse projects in industry.

**PSO 7:** Apply domain expertise to pursue research in Computer science and Information Technology discipline.

### **Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
	<b>Semester- I</b>	
MSITLE 231	Computer Networks	The objective of this paper is to familiarize the students with concept of various Networking Techniques.
MSITLE 232-	Programming in JAVA	The objective of this paper is to familiarize the students with concept of JAVA programming language.
MSITLE 233-	Software Engineering	This paper is to familiarize the students with concept of software engineering and different approaches used in software industry for software development.
MSITLE 234-	MS 234- Programming Lab V (Based on MS 232)	The objective of this paper is to familiarize the students with concept of JAVA

MSITLE 235-	MS 235- Programming Lab VI (Based on Linux)	The objective of this paper is to familiarize the students with Basic Linux commands, Shell programming, Networking in Linux operating system.
MSITLE 236-	MS 236- Choice Based Course (CBC- III)	
MSITLE 236 C1	Computer Graphics	The objective of this paper is to familiarize the students with concept various techniques related to Computer Graphics
MSITLE 236 C2	Organizational Behaviour & Development	1.To develop organizational skills among the students.  2.Students will learn different motivation theories which will help to make them confident to solve problems effectively.
	<b>Semester- II</b>	
MSITLE 241-	Artificial Intelligence	The objective of this paper is to familiarize the students with Significance of Artificial Intelligence in Computer Science field.
MSITLE 242-	Data Structure	The objective of this paper is to familiarize the students with concept of data & file structures in Information Technology.
MSITLE 243-	Web Development using PHP	The objective of this paper is to familiarize the students with concept of web development using PHP.

MSITLE 244-	Programming Lab VII (based on MS242)	The objective of this paper is to implement concepts of data & file structures in Information Technology.
MSITLE 245	Programming Lab VIII (based on MS243)	The objective of this paper is to implement concepts of web development using PHP.
MSITLE 246 C1	MIS	The objective of this paper is to familiarize the students with Significance of MIS in Computer Science field.
MSITLE 246 C2-	Software Testing	The objective of this paper is to familiarize the students with importance of Software Testing in Software Life Cycle and Engineering.

## **The Program Specific Outcomes and Course Outcomes of all the Programmes**

### **Program Name: Master of Computer Application (MCA)(2019-20)**

#### **Program Educational Objectives (PEO)**

### **Program Name: - MASTER OF COMPUTER APPLICATIONS**

#### **Program Code: - MCA**

The program aims are:

**PEO 1:** To achieve successful careers based on their understanding of formal and practical methods of Application Development using the concepts of computer programming, software and design principles.

**PEO 2:** To provide opportunities for acquiring in-depth knowledge of fundamental concepts and programming skills for holistic development.

**PEO 3:** To achieve peer-recognition; as an individual or in a team; by adopting ethics and

professionalism and communicate effectively to excel well in cross culture and inter-disciplinary teams.

**PEO 4:** To apply current tools, technologies and research to create systems for solving industry oriented problems.

**PEO 5:** To embed strong human values and professional ethics for becoming social responsibilities.

**PEO 6:** To continue a lifelong professional development in computing that contributes in self and societal growth.

### Program Outcomes (PO) Post Graduate Program (PG)

Program Name: - MASTER OF COMPUTER APPLICATIONS

### Program Code: - MCA

MCA programme has been designed to prepare graduates for attaining the following program outcomes:

**PO 1:** Ability to apply knowledge of mathematics, computer science and management in practice

**PO 2:** Ability to identify, critically analyze, formulate and develop computer applications

**PO 3:** Ability to select modern computing tools and techniques and use them with dexterity

**PO 4:** Ability to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability

**PO 5:** Ability to function professionally with ethical responsibility as an individual as well as in multidisciplinary teams with positive attitude

**PO 6:** Ability to appreciate the importance of goal setting and to recognize the need for life-long learning.

## Program Specific Outcomes(PSO)

### Program Name: - MASTER OF COMPUTER APPLICATIONS

Program Code: - MCA

**PSO 1:** Design, develop and implement interdisciplinary application software projects to meet the demands of industry requirements using modern tools and technologies.

**PSO 2:** Comprehend, explore and build up computer programs in the areas allied to Algorithms, System Software, Web Design, Mobile Application Development and Big Data Analytics for efficient design of computer-based systems of varying complexity.

**PSO 3:** The graduates of the program will practice the profession with ethics, integrity, leadership and social responsibility.

**PSO 4:** Develop ability to demonstrate team work with the ability of leadership, analytical reasoning for solving time critical problems and strong human values for responsible professional.

**PSO 5:** The graduates of the Program will be prepared to achieve their career goals in the software industry or pursue higher studies and enhance their professional knowledge.

### Course Outcome:

Course Code	Course	Course Outcome
MCA-111	Introduction to Information Technology	1.This course offers a good understanding of the various functional units of a computer system.  2.The students are also exposed to the recent trends in computing models.

MCA-112	Problem Solving & Programming in C	<p>1.To enable the students to solve the problems using programming technique and to implement these programming techniques to create software.</p> <p>2.This course will enable the students to analyse the real life problems and write a program in C language to solve the problem. The main emphasis of the course will be on problem solving aspect.</p>
MCA-113	Computer Organization & Architecture	<p>1.The objective of this course is to make the student understand the concept of programs as sequences of machine instructions.</p> <p>2.This course offers understanding the working of the control unit, memory and CPU.</p> <p>3.After the completion of course, the students will be able to understand the design of logic circuits.</p>
MCA-114	Mathematical Foundations of Computer Science	<p>1.The purpose of this course is to understand and use discrete structures as a backbone of computer science.</p> <p>2.This course is designed to introduce the students to the basic mathematics concept like set theory, algebraic structures, Boolean algebra, and graph theory.</p> <p>3.On the completion of this course, the students will be able to explain and apply the basic methods of discrete mathematics in Computer Science.</p>
MCA 115 C1	Communication Skills	<p>1. The proposed syllabus will help in enhancing Business Etiquettes, Media etiquettes, Table Etiquettes.</p> <p>2. This course will develop self</p>

		confidence in students by enhancing their verbal and non-verbal communication skills.
MCA 115 C2	Principles and Practices of Management	1.This course enables students to take better management and planning decisions. 2.Improves Communication and Interpersonal skills.
MCA 115 C3	Accountancy & Financial Management	1.Students will be exposed to the fundamental accounting concepts. 2.Finally students will be able to manage their day to day financial matters.
MCA-116	Programming Lab- I	1.This course offers a good understanding of the various functional units of a computer system. 2.The students are also exposed to the recent trends in computing models.
MCA-117	Programming Lab- II (Based on Paper MCA 112)	1.To enable the students to solve the problems using programming technique and to implement these programming techniques to create software. 2.This course will enable the students to analyse the real life problems and write a program in C language to solve the problem. The main emphasis of the course will be on problem solving aspect.
MCA 121	Data Communication	1.This course will make the students learn about different types of data transmission and data encoding techniques. By the end of the course, students will be able to create networks using various data transmission facilities. 2.This course will make the students learn about different types of data transmission and data encoding techniques.

		3.By the end of the course, students will be able to create networks using various data transmission facilities.
MCA 122	Web Designing	The objective of the course is to provide basic skills in Web Designing.  By the end of the course a student will be capable to create web sites.
MCA 123	Database Management System	1.To provide basic introduction to database system technologies.  2.To form the basic conceptual background necessary to design and develop simple database systems.
MCA 124	Workshop on Digital Creativity using Corel Draw & Adobe Photoshop	The objective of the course is to provide basic skills in CorelDraw.  By the end of the course a student will be capable to edit images and create documents using the features and tools available in Corel Draw.
MCA 125 C1	Business Intelligence	To help students become familiar with the fundamental of Business Intelligence. Students will learn different business theories which will help to make them handle business effectively.
MCA 125 C2	Organizational Behaviour & Development	1.To develop organizational skills among the students.  2.Students will learn different motivation theories which will help to make them confident to solve problems effectively.
MCA 125 C3	Computer Oriented Numerical Methods	1.The objective of this course is to make students familiar with numerical methods so that they are able to do numerical analysis and to solve based problems.  2.Students will learn Numerical differentiation, Integration, Interpolation

		and curve fitting.
MCA 126	MCA 126- Programming Lab-III (Based on Paper MCA 122)	<p>1.To provide information about concepts of OOPS.</p> <p>2.By the end of the course a student will be capable to design and develop different computer software applications using C++.</p>
MCA 127	MCA 127- Programming Lab-IV (Based on Paper MCA 123)	<p>1.To implement the database system technologies.</p> <p>2.To form the basic conceptual background necessary to design and develop simple database systems.</p>
MCA 231	Object Oriented Programming using C++	<p>1.To provide information about concepts of OOPS.</p> <p>2.By the end of the course a student will be capable to design and develop different computer software applications and will be able to implement various algorithms in programming languages for research.</p>
MCA 232	Operating System	<p>1.To help students become familiar with the fundamental concepts of operating systems and provide students with sufficient understanding of operating system design.</p> <p>2.Students will be exposed in such a way as to permit the effective development, testing, and introduction of new system functions without interfering with service.</p>
MCA 233	Computer Networks	<p>1.To help students become familiar with the fundamental concepts of Computer Networks.</p> <p>2.Students will be made aware about different Network Layers and Network</p>

		Security.
MCA 234	Data Structures	<p>1.To help students become familiar with the fundamental concepts of Data Structures.</p> <p>2.Students will be exposed to use of different Data Structures like stacks, Queues, Linked Lists, Trees, Graphs etc.</p>
MCA 235 C1	Software Engineering and Testing	<p>1.To study how to test projects at each stage of the software development life cycle.</p> <p>2.To train software project managers and other individuals involved in software project planning and tracking and oversight in the testing of the software project management process.</p>
MCA 235 C2	CMS	<p>1.To develop understanding of the basic framework of CMS.</p> <p>2. To develop an understanding of various web design techniques.</p>
MCA 235 C3	System Software	<p>1.The objective of this course is to help students become familiar with the fundamental concepts of System Software and provide students with sufficient understanding of features of system programming.</p> <p>2.Students will be exposed to different system software like compilers, assemblers etc.</p>
MCA 236	Programming Lab- V (Based on MCA 231)	<p>1.To implement the concepts of Java.</p> <p>2.By the end of the course a student will be capable to design and develop different computer software applications in Java.</p>

MCA 237	Programming Lab- VI (Based on MCA 234)	<p>1.To help students become familiar with the fundamental concepts of Data Structures.</p> <p>2.Students will be exposed to use of different Data Structures like stacks, Queues, Linked Lists, Trees, Graphs etc.</p>
MCA 241	Computer Graphics	<p>1.The objective of this course is to help students become familiar with the fundamental concepts of Computer Graphics.</p> <p>2. Students will be exposed to implementation of 2D and 3D Graphics.</p>
MCA 242	Programming in JAVA	<p>1.To provide information about concepts of Java.</p> <p>2.By the end of the course a student will be capable to design and develop different computer software applications in Java.</p>
MCA 243	Relational Database Management System	<p>1.To provide basic introduction to relational database system technologies.</p> <p>2.To form the basic conceptual background necessary to design and develop simple database systems.</p>
MCA 244	Algorithm Analysis & Design	<p>1.To analyze the asymptotic performance of algorithms and write rigorous correctness proofs for algorithm.</p> <p>2.Demonstrate a familiarity with major algorithms and data and apply important algorithmic design paradigms and methods of analysis.</p>

MCA 245 C1	Object Oriented Analysis & Design UML	<p>1.To understand the importance and basic concepts and of object oriented modeling.</p> <p>2.Specify, analyze and design the use case driven requirements for a particular system.</p> <p>3.Model the event driven state of object and transform them into implementation specific layouts.</p>
MCA 245 C2	Data Mining	<p>1.To interpret the contribution of data warehousing and data mining to the decision-support level of organizations &amp; evaluate different models used for OLAP and data preprocessing.</p> <p>2.To categorize and carefully differentiate between situations for applying different data-mining techniques: frequent pattern mining, association, correlation, classification, prediction, and cluster and outlier analysis</p>
MCA 245 C3	Computer Based Optimizaion Techniques	<p>1.To develop proficiency in business study and decide the feasibility of system.</p> <p>2.To carry out the profitable solution for an industries.</p>
MCA 246	Programming Lab- VII (Based on MCA 241)	<p>1.To understand the need of developing graphics application.</p> <p>2.Learn algorithmic development of graphics primitives like: line, circle, polygon etc.</p> <p>3.Learn the representation and transformation of graphical images and pictures.</p>

MCA 247	Programming Lab- VIII (Based on MCA 242)	To develop professional web pages with server side scripting.
MCA 351	Theory of Computation	<p>1. Provide the basic knowledge to the students to understand the relationship between the automata and regular expressions.</p> <p>2. To make students aware regarding the role of context free grammar, simplification of grammar and parsing.</p>
MCA 352	Programming With Python	<p>1. The contents learnt under this course will enable students to learn a new programming language which has high demand in industry.</p> <p>2. Students are expected to use Dictionary, Functions in effective manner in order to create a reliable and user friendly application.</p>
MCA 353 C1	PHP (PHP Hypertext Preprocessor)	<p>1. Students will be able to create Web applications and web sites after completing this course.</p> <p>2. Students will learn to handle Relational database using queries embedded in PHP functions.</p>
MCA 353 C2	Mobile Application Development using Android	<p>1. Students will be able to create Android based Mobile applications like camera, telephony apps.</p> <p>2. Students will learn to handle SQLite database using Android and will also be able to create and use web services for handling remote databases.</p>
MCA 354	Programming Lab-IX based on MCA-353 (Elective)	Students will implement the programs depending upon the choice of elective in MCA 353.

MCA 355	Big Data Analysis using HADOOP	<ol style="list-style-type: none"> <li>1. This workshop will enable the students to manage a very large amount of data in a database effectively.</li> <li>2. Students will learn to store and retrieve data on distributed computers in a network.</li> </ol>
MCA 356	Minor Project	<ol style="list-style-type: none"> <li>1. Students will create an application (either web or mobile) in a technology learnt under Elective subjects.</li> <li>2. To enable students to plan, manage and create project that support organization's or an individual's strategic goals.</li> </ol>
MCA 361	Project	To prepare students for software industry, government, academia, research, entrepreneurial pursuit and consulting firms. Students work on live projects and get hands on experience on different aspects of software project development.

## The Program Specific Outcomes and Course Outcomes of all the Programmes

### Program Name: Post Graduate Diploma in Computer Application (PGDCA)(2019-20)

#### Program Educational Objectives (PEO)

#### Program Name: - POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS

#### Program Code: - PGDCA

The Program aims are

**PEO 1:** Evolve as globally competent computer professionals possessing leadership skills for developing innovative solutions in multidisciplinary domains.

**PEO 2:** Excel as socially committed individual having high ethical values and empathy for the needs of society.

**PEO 3:** Trained to demonstrate creativity develops innovative ideas and. to work in teams to accomplish a common goal.

**PEO 4:** Involve in lifelong learning to adapt the technological advancements in the emerging areas of computer applications.

**PEO 5:** To provide practical training, hands-on and project experience to meet the industrial needs.

### Program Outcomes (PO) Post Graduate Program (PG)

Program Name: - POST GRADUATE DIPLOMA IN COMPUTER

APPLICATIONS

### Program Code: - PGDCA

At the end of the Post Graduate Diploma in Computer Applications, Students will be able to:

**PO 1:** The programme is aimed towards building prospective career in the field of computer application.

**PO 2:** The PG Diploma is aimed at graduates with a computing background and provides a detailed coverage of the key concepts and challenges in data and resource protection and computer software security.

**PO 3:** To give hands on to students while developing real life IT application as part of the study.

**PO 4:** To train graduate students in basic computer technology concepts and information technology applications.

**PO 5:** Design and develop applications to analyze and solve all computer science related problems.

## Program Specific Outcomes (PSO)

**Program Name: - POST GRADUATE DIPLOME IN COMPUTER APPLICATIONS**

**Program Code: - PGDCA**

**PSO 1:** This Programme equips the students with skills required for designing, developing applications in Computer Science.

**PSO 2:** Students will able to learn the latest trends in various subjects of computers & information technology

**PSO 3:** To expose the students to open Source technologies so that they become familiar with it and can seek appropriate opportunity in trade and industry.

**PSO 4:** Able to provide socially acceptable technical solutions to real world problems with the application of modern and appropriate programming techniques.

**PSO 5:** Design applications for any desired needs with appropriate considerations for any specific need on societal and industrial aspects.

### Course Outcome:

Course Code	Course	Course Outcome
	<b>Semester- I</b>	
PGDCA 101	Introduction to Information Technology	To understand the basics of computer system, its architecture, number system and Networks.  To understand the basic concepts, terminology of IT and familiar with the applications of Internet.
PGDCA 102	-Programming Fundamentals Through C Language	The objective of this paper is to familiarize the students with the core concepts of C Language and program development.  To make the students aware of pointers,

		structure and file handling system using C Language.
PGDCA 103	- Database Management System	To gain a good understanding of the architecture and functioning of database management systems.  To understand the principles of data modeling using entity relationship and develop a good database design and normalization techniques to normalize a database.
PGDCA 104	- Software Lab- I Office Automation & Productivity Tools	To learn the working knowledge of windows and its accessories.  To learn the various features of MS-Office.
PGDCA 105	- Software Lab- II Based on PGDCA 102	To familiarize the students with C language environment.  To implement various concepts related to C language.
PGDCA 106 C1	- Workshop on Page Maker	The objective of the course is to provide basic skills in Page Maker.  By the end of the course a student will be capable to edit and create documents using the features and tools available in Page Maker.
PGDCA 106 C2	- Workshop on Corel Draw	The objective of the course is to provide basic skills in CorelDraw.  By the end of the course a student will be capable to edit images and create documents using the features and tools available in Corel Draw.

<b>Semester- II</b>		
PGDCA 201	- Fundamentals of Computer Network, Internet & Scripting Languages	<p>To explain how communication works in computer networks and to understand the basic terminology of computer networks</p> <p>To understand design issues in Network Security and to understand security threats, security services and mechanisms to counter them.</p>
PGDCA 202	- Object Oriented Programming With C++	<p>To understand the difference between object oriented programming and procedural oriented language and data types in C++. To make the students able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.</p>
PGDCA 203	E-Technologies	<p>The objective of this paper is to familiarize the students with current E-Technology tools used in software industry.</p>
PGDCA 204	- Software Lab- III Based on PGDCA 201	<p>The objective of this paper is to familiarize the students with the core concepts of scripting Language and program development.</p>
PGDCA 205-	Software Lab- IV Based on PGDCA 202	<p>To familiarize the students with basics and object oriented concepts of C++</p> <p>To implement various OO concepts related to language.</p>

PGDCA 206 C1-	Workshop on Photoshop	The objective of the course is to provide basic skills in Photoshop. By the end of the course a student will be capable to edit and create documents using the features and tools available in Photoshop.
PGDCA 206 C2	- Principles & Practices of Management	The objective of the course is to teach managerial skills to aspiring manager or the trained managers who want to become more effective.  The subject also emphasis on conceptual and technical frameworks of leadership and the role of communication.
<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
COMP-1	<b>Computer Fundamental</b>	<ol style="list-style-type: none"> <li>1. To understand the basics of computer system, its architectureNetworks.</li> <li>2. To understand the basic concepts, terminology of IT and familiar with the use of IT tools.</li> <li>3. To Learn and explore new IT techniques in various applications and to identify the issues related to security.</li> <li>4. To learn basic of word processing ,spreadsheet and presentation.</li> <li>5. To be able to access the Internet, and internet application</li> </ol>
<b>COMP-2</b>	<b>Computer Programming using C</b>	<ol style="list-style-type: none"> <li>1. Learn how to draw flowcharts and write algorithm/pseudocode.</li> <li>2. Learn, how to compile and debug programs in C language, use different data types, operators and console I/O function in a computer program.</li> <li>3. Design programs involving decision control statements, loop control statements, case control structures, arrays, strings,</li> </ol>

		pointers, functions and implement the dynamics of memory by the use of pointers
<b>COMP-3:</b>	<b>Data Structure</b>	<ol style="list-style-type: none"> <li>1. Implement the basic data structures and solve problems using fundamental algorithms.</li> <li>2. Implement various search and sorting techniques.</li> <li>3. Find the complexity of algorithms, to provide justification for that selection, and to implement the algorithm in a particular context.</li> <li>4. To understand the abstract data types stack, queue, deque, and list. To understand prefix, infix, and postfix expression formats</li> </ol>
<b>COMP-4</b>	<b>Database Management systems</b>	<ol style="list-style-type: none"> <li>1. To understand the different issues involved in the design and implementation of a database system.</li> <li>2. To study the physical and logical database designs, database modeling, relational, hierarchical, and network models.</li> <li>3. Analyze Database design using E-R data model by identifying entities, attributes, relationships, generalization and specialization along with relational algebra.</li> <li>4. Use data manipulation language to query, update, and manage a database the given real world problem</li> <li>5. Use of SQL and PL/SQL to implementation database applications with usage of DDL aspect of SQL, DML aspect</li> </ol>

		of SQL.
<b>DSE-1</b>	<b>Operating System:</b>	<ol style="list-style-type: none"> <li>1. Explain basic operating system concepts such as overall architecture, interrupts, APIs, user mode and kernel mode.</li> <li>2. Distinguish concepts related to concurrency including, synchronization primitives, race conditions, critical sections and multi-threading. segmentation, virtual memory, and thrashing.</li> <li>5. Understand concepts such as file systems, security, protection, virtualization and device-management, disk-scheduling algorithms and various file systems.</li> <li>6. Use basic Linux commands and shell programming.</li> <li>3. Learn and apply CPU scheduling algorithms, deadlock detection and prevention algorithms.</li> <li>4. Examine and categorise various memory management techniques like caching, paging,</li> </ol>
<b>DSE-2</b>	<b>Software Engineering:</b>	<ol style="list-style-type: none"> <li>1. Analyze software development process models, including agile models and traditional models like waterfall.</li> <li>2. Demonstrate the use of software life cycle through requirements gathering, choice of process model and design model.</li> <li>3. Use various UML Models for software analysis, design and testing.</li> <li>4. Acquire knowledge about the concepts of application of formal specification, CASE tools and configuration management for software development.</li> </ol>

		5. Analysis of software estimation techniques for creating project baselines.
<b>SEC – 1</b>	<b>Web Designing:</b>	<ol style="list-style-type: none"> <li>1. Implement interactive web page(s) using HTML, CSS and JavaScript.</li> <li>2. Design a responsive web site using HTML5 and CSS3.</li> <li>3. Demonstrate Rich Internet Application.</li> </ol>
<b>SEC – 2</b>	<b>PHP Programming:</b>	<ol style="list-style-type: none"> <li>1. Test and debug a PHP application, Use cookies and sessions, Work with regular expressions, handle exceptions and validate data.</li> <li>2. Build Dynamic web site using server side PHP Programming and Database connectivity.</li> <li>3. Describe and differentiate different Web Extensions and Web Services.</li> <li>4. Demonstrate web application using PHP.</li> </ol>
<b>SEC – 3</b>	<b>Object Oriented Programming using C++</b>	<ol style="list-style-type: none"> <li>1. Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.</li> <li>2. Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.</li> </ol>
<b>SEC – 4</b>	<b>Visual Programming:</b>	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements,</li> </ol>

		etc.) 2. Develop a Graphical User Interface (GUI) based on problem description 3. Develop programs that retrieve input from a file as opposed to input only provided by user
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### M.A. - FINE ARTS

#### The Program Specific Outcomes and Course Outcomes of all the Programmes

#### Program Name : Master of Fine Arts

Course Code	Course (M.A.Fine Arts)	Course Outcome
MAFA -101	HISTORY OF INDIAN ART	<ol style="list-style-type: none"> <li>1. The students will be able to acquaint with different styles and development of forms in Indian architecture ,rock cut as well as temples.</li> <li>2. Emphasized on to make them aware of the different terms , concepts , forms and subject matter of these works.</li> <li>3. Introduction of different style of art works various art schools and phases of works.</li> </ol>
MAFA - 102	AESTHETICS AND PRINCIPLES OF ART APPRECIATION	<ol style="list-style-type: none"> <li>1. The students are introduced to the concepts of art its principles, basic terms and categories.</li> <li>2. To make the students enable them to engage with visual and conceptual comparison in arts of different times and places.</li> <li>3. To make them able to evaluation of art works different trends and points of view eastern and western.</li> </ol>

<b>MAFA -103P</b>	CREATIVE LANDSCAPE	<ol style="list-style-type: none"> <li>1. The students will be able to gradually develop the proficiency in work and his understanding of creative works.</li> <li>2. The students will be aware to use the new materials ,new techniques of modern art.</li> <li>3. Gain knowledge about to introduced the imaginative and original composition based on natural elements</li> </ol>
<b>MAFA -104A (P) 104B (P)</b>	PORTRAIT PAINTING\ CREATIVE COMPOSITION	<ol style="list-style-type: none"> <li>1. The students will be able to study thge featuers,complexion ,expression in various medium and structural character of head.</li> <li>2. The students will be aware about imaginative composition based on human figures, figurative and non figurative elements of nature.</li> <li>3. Gain knowledge about to do mounting, framing and presentation of artifacts in the form of exhibition and display.</li> </ol>
<b>MAFA -106</b>	SEMINAR \ PROJECT WORK	
<b>MAFA -201</b>	HISTORY OF INDIAN ART UPTO 1850AD	<ol style="list-style-type: none"> <li>1. The students will be aware about the development of miniature art style, concepts, forms and subject matter of these works.</li> <li>2. The students will be able to inculcating mind involvement In the art process by exploration in basic studies, styles and development of Indian sculptures</li> <li>3. The students will be aware the development in the field of art they will also be informed about socio-political and religious cricumstances of art during this period.</li> </ol>
<b>MAFA - 202</b>	AESTHETIC AND PRINCIPLES OF ART	<ol style="list-style-type: none"> <li>1. To show the aesthetical and critical</li> </ol>

	APPRECIATION	<p>awareness with detail study of principles of art , six limbs of art.</p> <ol style="list-style-type: none"> <li>To make them understand the various concepts forms, terms, subjects matter and their impotance in routine life EXAMPLE:- The folk art</li> <li>Deeper understanding of modern concepts open to the contemporary works/artists</li> </ol>
MAFA -203P	CREATIVE LANDSCAPE	<ol style="list-style-type: none"> <li>The students will be able to equip with such abilities as to inspire them recreated the living qualities of our art traditions in the contemporary manifestations of their works.</li> <li>Gain knowledge about to introduced the imaginative and original composition based on natural elements.</li> <li>The students will be aware to use the new materials ,new techniques of modern art.</li> </ol>
MAFA -204A (P) 204B (P)	PORTRAIT PAINTING\ CREATIVE COMPOSITION	<ol style="list-style-type: none"> <li>The students will be able to study thge featuers,complexion ,expression in various medium and structural character of different age groupes.</li> <li>The students will be aware about imaginative composition based on human figures, figurative and non figurative elements of nature.</li> <li>The students will be able to learn theory of pictorial space including figures and ground ,three dimension , sub division and grouping of objects.</li> </ol>
MAFA -206	SEMINAR \ PROJECT WORK	
MAFA - 301	ART AND CULTURE HISTORY OF EUROPE	<ol style="list-style-type: none"> <li>Important and necessary criticism and evaluation of art work , art trends from the western points of view.</li> <li>In western context emergence of new</li> </ol>

		<p>trends and their impact will be discussed .</p> <ol style="list-style-type: none"> <li>3. The aim to study western culture and art taking into account the theories of various art periods</li> </ol>
<b>MAFA -302</b>	<b>MODERN MOVEMENTS WESTERN ART</b>	<ol style="list-style-type: none"> <li>1. The aim is to impart information about the development in the different movements in India and the west.</li> <li>2. The students will be able to study about western artists taking into account theories and works during different Isms</li> <li>3. The students will be able to evaluation of art works different trends and points of view eastren and western.</li> </ol>
<b>MAFA -303P</b>	<b>CREATIVE COMPOSITION</b>	<ol style="list-style-type: none"> <li>1. The students will be able to equip with such abilities as to inspire them recreated the living qualities of our art traditions in the contemporary manifestations of their works.</li> <li>2. Make the students able to design composition with exploration of various phases of contemporary painting in order to develop creativity.</li> <li>3. The students will be aware to use the new materials ,new techniques of modern art.</li> </ol>
<b>MAFA -304A (P) 304B (P)</b>	<b>PAINTING FROM LIFE\ CREATIVE LANDSCAPE COMPOSITION</b>	<ol style="list-style-type: none"> <li>1. Extend the students knowledge in different shapes from models of a different age groups.</li> <li>2. Make students aware to advanced study from life models to develop a volume conception , human structure as it relates to form , contour and movement.</li> <li>3. The students will be able to</li> </ol>

		understand the academic related to proportion structure tonal values , volumes and perspective
<b>MAFA -306</b>	SEMINAR \ PROJECT WORK	
<b>MAFA 401</b>	ART AND CULTURE HISTORY OF EUROPE	<ol style="list-style-type: none"> <li>1. The students will be able aware of the different phases of western art history through the centuries.</li> <li>2. The students will be able to discussing about field of art ,they also informed about socio-political and religious circumstances.</li> <li>3. The students will be understand to introduce the different styles and phases of painting and sculpture of europe.</li> </ol>
<b>MAFA -402</b>	MODERN MOVEMENTS INDIAN ART	<ol style="list-style-type: none"> <li>1. The students will be able to learn the modern aspects of art and new trends,concepts and subject matter of these works.</li> <li>2. Gain knowledge about brief history of Ism's and conceptual composition during that time.</li> <li>3. The students will be able to understand with different style and development of works in india and west</li> </ol>
<b>MAFA -403P</b>	CREATIVE COMPOSITION	<ol style="list-style-type: none"> <li>1. The students will be able to equip with such abilities as to inspire them recreated the living qualities of our art traditions in the contemporary manifestations of their works.</li> <li>2. The students will be aware about imaginative composition based on human figures, figurative and non figurative elements of nature.</li> <li>3. Gain knowledge about to do mounting, framing and presentation of artifacts in the form of exhibition and display.</li> </ol>

<b>MAFA -404A (P)</b> <b>404B (P)</b>	PAINTING FROM LIFE\ CREATIVE LANDSCAPE COMPOSITION	<ol style="list-style-type: none"> <li>4. Make students aware to advanced study from life models to develop a volume conception , human structure as it relates to form , contour and movement.</li> <li>5. The students will be able to understand the academic related to proportion structure tonal values , volumes and perspective</li> <li>6. The course is to facilitate the students to develop his\her own individual creative visual language in order to effectivelu express through their medium of expression.</li> </ol>
<b>MAFA -406</b>	SEMINAR \ PROJECT WORK	

## **The Program Specific Outcomes and Course Outcomes (2019-20)**

**Program Name: Master of Arts (MAH)**

**Course Name: History**

### **Program Outcome (PO)**

PO 1. Capacity to explain how and why important events.

PO 2. Understanding of the historical method of study.

PO 3. A clear understanding of evidence collected from historical sources.

PO 4. Critical understanding development in historiography.

PO 5. Knowledge of the history of the India and Modern world.

PO 6. Awareness of Current historical debates.

PO 7. Understand the skills that historians use in research.

### **Program Specific Outcome (PSO)**

PSO 1. Explore the experiences of the human past and become aware of the views, aspirations and struggles of the prior human communities this help them to better understand the problems and promises of our times.

PSO 2. Understand the present existing social, political, religious and economic conditions of the people

PSO 3. Gain knowledge about background of our religions, customs, institutions, administrations, science, wars and social events.

PSO 4. Develop interest as well as love for reading historical figures, characters, events and facts which are found necessary for solving the present problems effectively.

PSO 5. Use the readings of the history subject in most of the competitive exams like UPSC, PTET, UGC-NET, CTET, Net Banking and so many other exams.

PSO 6. Understand the identity of the nation as without History no nation can survive.

PSO 7. Understand the basic themes, concepts, chronology and scope of history.

PSO 8. Learn the various histories of nations with comparative approach.

### **Program Educational Outcomes (PEO)**

PEO 1. History students will acquire knowledge about the Sikhism. The socio, political, religious and cultural features of medieval and modern Punjab. Students can gather knowledge regarding Lahore administration and British rule in Punjab.

PEO 2. The students of history learn about some significant events of Modern West. Such as- Renaissance, Humanism, Reformation, American War of Independence, the Industrial Revolution. They will get knowledge from the debates which explain the transition of feudalism to capitalism.

PEO 3. Students will gather knowledge about the Bismarck and his diplomacy, system of alliance, 1917 Russian Revolution, Fascism, Nazism and the origin of World War II all these important issues of World.

PEO 4. Students will gather knowledge about expansion and consolidation of British Empire, economic changes, land revenue settlements, commercialization of agriculture, de-industrialization, spread of western education, Indian Renaissance, several peasants and tribal movements.

PEO 5. Students will gather knowledge about nationalism, genesis of congress, moderates, extremists, Gandhi and his movements, communal politics and partition of India.

### **Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
MAHIS101	HISTORY OF THE PUNJAB (A.D. 1469-1675)	<ol style="list-style-type: none"><li>1. The students will be able to know about the foundation of Sikh Faith.</li><li>2. The students will understand the various institutions of Sikh Faith</li><li>3. Understand the concept of Martyrdom of Sikh Gurus</li></ol>

MAHIS102	HISTORY OF THE WORLD (A.D. 1500-1815)	<ol style="list-style-type: none"> <li>1. Gain knowledge about the Renaissance and Reformation of Europe.</li> <li>2. The students will understand the importance of American Revolution and French revolution.</li> <li>3. The students will evaluate the reforms and continental system of Napoleon</li> </ol>
MAHIS103	HISTORY: ITS THEORY AND RESEARCH METHODOLOGY	<ol style="list-style-type: none"> <li>1. The students will understand the scope and purpose of History</li> <li>2. Enable the students to understand the history relations with other disciplines</li> <li>3. The students will be able to learn and make use of different techniques of research methodology.</li> </ol>
MAHIS104(A)	HISTORY OF THE WORLD (A.D. 1871-1919)	<ol style="list-style-type: none"> <li>1. The students will be able to evaluate the era of Bismarck</li> <li>2. Understand the partition of Africa</li> <li>3. The students will gain knowledge about the causes and effects of the first world war.</li> </ol>
MAHIS104(B)	HISTORY OF THE USA (A.D. 1860-1914)	<ol style="list-style-type: none"> <li>1. The students will gain knowledge of important landmarks in history of the U.S.A</li> <li>2. The students will understand the economic expansion of U.S.A</li> <li>3. Gain knowledge about slavery in U.S.A</li> </ol>
MAHIS201	HISTORY OF THE PUNJAB (A.D 1675-1799)	<ol style="list-style-type: none"> <li>1. To enable the students study of the KhalsaPanth</li> <li>2. The students will understand the first independent rule of the Sikhs</li> <li>3. To gain knowledge regarding the Sikhs struggle against the Mughals and Afghans</li> </ol>
MAHIS202	HISTORY OF THE WORLD (A.D 1815-1870)	<ol style="list-style-type: none"> <li>1. The students will gain knowledge about the era of Metternich</li> <li>2. The students will develop knowledge about the growth of Parliamentary System in England</li> <li>3. Understand the various phases of unification Italy and German.</li> </ol>
MAHIS203	HISTORY: ITS THEORY AND RESEARCH METHODOLOGY	<ol style="list-style-type: none"> <li>1. The students will be able to understand the Emerging Trends of History</li> <li>2. The students will develop knowledge and skills for thesis writing</li> <li>3. Gain knowledge about the new avenues in doing historical research</li> </ol>

MAHIS204 (A)	HISTORY OF THE CONTEMPORARY WORLD (A.D 1919-1991)	<ol style="list-style-type: none"> <li>1. Understand the burning issues of the world</li> <li>2. The students will gain knowledge regarding U.N.O</li> <li>3. The students will be able to understand the Disintegration of U.S.S.R</li> </ol>
MAHIS204 (B)	HISTORY OF THE U.S.A (A.D. 1914-1973)	<ol style="list-style-type: none"> <li>1. The students will develop awareness about the History of the U.S.A</li> <li>2. The students will be able to assess the impact of the U.S.A foreign policy since the world war</li> <li>3. The students will gain knowledge regarding U.S.A role in the U.N.O</li> </ol>
MAHIS301	HISTORY OF PUNJAB (A.D. 1799-1849)	<ol style="list-style-type: none"> <li>1. Understand political condition of the Punjab on the eve of Ranjit Singh accession to Power</li> <li>2. The students will be able to know about the contribution of the Ranjit Singh security of North –West frontier and administration</li> <li>3. The students will gain knowledge about the first and second Anglo Sikh Wars.</li> </ol>
MAHIS302	HISTORY OF INDIA (A.D. 1707-1772)	<ol style="list-style-type: none"> <li>1. The students will be able to analyze the downfall of Mughal Empire</li> <li>2. Understand the political History of the Regional Powers</li> <li>3. The students will gain knowledge about the struggle of European Companies for Supremacy in India</li> </ol>
MAHIS303	HISTORY OF INDIA (A.D 1818-1947)	<ol style="list-style-type: none"> <li>1. Understand the policies of British Governor-General's</li> <li>2. The students will understand about the Revolt of 1857</li> <li>3. The students will gain knowledge regarding the British relations with other countries.</li> </ol>
MAHIS304 (A)	NATIONAL MOVEMENT IN INDIA AND CONSTITUTIONAL DEVELOPMENTS (A.D 1858-1930)	<ol style="list-style-type: none"> <li>1. Gain knowledge about the I.N.C</li> <li>2. The students will understand the policies of Moderates and Extremists</li> <li>3. The student will gain knowledge about the Gandhian Movements</li> </ol>

MAHIS304 (B)	STUDY OF INSTITUTIONS: SOCIAL, CULTURAL AND ECONOMIC	<ol style="list-style-type: none"> <li>1. The students will gain knowledge about the society of Medieval India</li> <li>2. Understand the policies of Sultans of Delhi</li> <li>3. The students will learn about the importance of historical monuments of India under Sultans of Delhi</li> </ol>
MAHIS401	HISTORY OF PUNJAB (A.D. 1849-1947)	<ol style="list-style-type: none"> <li>1. The students will gain knowledge about the society and economy of Punjab</li> <li>2. The students will be able to evaluate the socio-religious reforms movements of Punjabi society</li> <li>3. The students will be aware of the partition of Punjab</li> </ol>
MAHIS402	HISTORY OF INDIA (A.D. 1772-1818)	<ol style="list-style-type: none"> <li>1. Understand the establishment of British Empire</li> <li>2. The students will gain knowledge about the Administration policies of Governor-Generals</li> <li>3. The students will develop knowledge about the Downfall of Mysore, Maratha and Pindaris</li> </ol>
MAHIS403	SOCIAL AND ECONOMIC HISTORY OF MODERN INDIA (A.D. 1818-1947)	<ol style="list-style-type: none"> <li>1. The students will gain knowledge about the socio-religious reforms movements in India</li> <li>2. The students will be able to know about the New Middle class of India</li> <li>3. Understand the Economic policies of the British</li> </ol>
MAHIS404 (A)	NATIONAL MOVEMENT IN INDIA AND CONSTITUTIONAL DEVELOPMENTS (A.D 1930-1947)	<ol style="list-style-type: none"> <li>1. The students will be able to understand the hard earned freedom</li> <li>2. The students will be able to appreciate and respect national leaders</li> <li>3. Gain knowledge about the value of Patriotism and Nationalism</li> </ol>

MAHIS404 (B)	STUDY OF INSTITUTIONS- SOCIAL, CULTURAL AND ECONOMIC UNDER THE MUGHALS	<ol style="list-style-type: none"> <li>1. Gain knowledge about the land Revenue system of Mughal India</li> <li>2. Understand the Mansabdari and Jagirdari Systems</li> <li>3. The students will develop knowledge about the importance of Historical monuments of Mughal India.</li> </ol>
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**DEPARTMENT OF JOURNALISM & MASS COMMUNICATION**  
**PROGRAMME SPECIFIC OUTCOMES AND COURSE OUTCOMES**  
**Session 2019-2020**

Program Educational Objectives (PEO) for Under Graduate Program

**Program Name: BACHELOR OF JOURNALISM AND MASS  
COMMUNICATION**

**Program Code: BA (JMC)**

The program aims are:

**PEO 1.** To introduce the students to the basics of journalism and mass communication and to improve their communication skills.

**PEO 2.** The course provides the opportunity to enhance one's communication skills along with other personality skills that will be of great help for the students further in their career.

**PEO 3.** The students would have acquired great confidence by the end of the course.

**PEO 4.** The students will have a clear and basic knowledge about the field they are entering into and they will also learn to have an effective communication with their audience.

**PEO 5.** To develop conceptual and analytical abilities required for effective decision making in ever changing business environment.

**PEO 6.** The students learn competencies and skills required by the media world.

**PEO 7.** The students will be able to communicate better within the media industry.

**PEO 8.** The students will be able to contribute towards developing the nation after learning the role played by the media in the society.

**PEO 9.** The students will be able to use the computer applications of media with ease and as per their requirement.

**PEO 10.** The students will be able to understand the importance of various elements of the editorial page and the role they play in the newspaper.

### **Program Outcomes (PO) For Under Graduate Program**

## **Program Name: - BACHELOR OF JOURNALISM AND MASS COMMUNICATION**

### **Program Code: BA (JMC)**

After completing undergraduate program in Journalism and Mass Communication, students will be able:

**PO 1.** To better understand the basics of mass communication that will definitely improve their communication skills.

**PO 2.** To improve their writing, speaking, listening and reading skills.

**PO 3.** To acquire a great confidence by the end of the course.

**PO 4.** To have a clear and basic knowledge about the field they are entering into and they will also learn to have an effective communication with their audience.

**PO 5.** To develop conceptual and analytical abilities required for effective decision making in ever changing business environment.

**PO 6.** To learn competencies and skills required by the media world.

**PO 7.** To communicate better within the media industry.

**PO 8.** To communicate their message effectively within different cultures.

**PO 9.** To contribute towards developing the nation after learning the role played by the media in the society.

**PO 10.** To use the computer applications of media with ease and as per their requirement.

### Program Specific Outcomes (PSO) for Under Graduate Program

#### **Program Name: - BACHELOR OF JOURNALISM AND MASS COMMUNICATION**

#### **Program Code: BA (JMC)**

**PSO 1.** The students will be able to polish their skills further in their area of the specialization.

**PSO 2.** The course provides the opportunity to enhance the students' skills of drafting, writing and editing the T.V. news programs.

**PSO 3.** The students will easily comprehend the role, relevance and effect of the different International organizations on Indian media and society.

**PSO 4.** The students will be able to grasp and write well about the national and international issues.

**PSO5.** The students will be able to decide and make informed decisions about the content strategy, audience fragmentation, media buying and selling and other elements involved in planning a media campaign.

**PSO 6.** The students will learn competencies and skills required by the media world.

**PSO 7.** The students will be able to communicate better within the media industry.

**PSO 8.** The students will perform better managerial and individual roles in an organization.

**PSO 9.** The students will be able to use the computer applications of media with ease and as per their requirement.

**PSO 10.** The students will be able to produce packages, short film and documentaries.

<u>Code</u>	<u>Course</u>	<u>Outcomes</u>
BAJMC-101	PUNJABI LAZMI	1.Students will improve the writing skills in Punjabi 2. Students will have knowledge of Punjabi Literature which will further help them in Journalistic career.
BAJMC-102	INTRODUCTION TO JOURNALISM	1. The students will have a clear and basic knowledge about the field they are entering into.
BAJMC-103	INTRODUCTION TO COMMUNICATION	1. The students will be able to communicate better within the media industry. 2. They will also learn to have an effective communication with their audience.
BAJMC 104	ENVIRONMENTAL & ROAD SAFETY AWARENESS	1. The students will be easily able to identify and work upon the problems of environment, road safety and inform others about it too.
	SELECT ANY ONE	
BAJMC-105 A	INDIAN ADMINISTRATION	1.The students will write better news copies when they have a wide knowledge about such subjects.
BAJMC-105 B	MEDIA & SOCIETY	1.The students will be able to contribute towards developing the nation after learning the role played by the media in the society. 2.The knowledge of social structure will help the students to communicate better with various strata of the society.

<b>Code</b>	<b>Course</b>	<b>Outcome</b>
BAJMC-201	COMMUNICATIONS SKILLS IN ENGLISH	1.Students will improve the writing, speaking, listening, reading skills in English 2. Students will have knowledge of Literature which

		will further help them in Journalistic career.
BAJMC-202	REPORTING & EDITING FOR PRINT	<ol style="list-style-type: none"> <li>1. The students will be capable to draft a news story from a rough copy.</li> <li>2. The students will be able to understand the role and function of every member of the media industry.</li> </ol>
BAJMC-203	MEDIA & CULTURAL STUDIES	<ol style="list-style-type: none"> <li>1. The students will be able to communicate their message effectively within different cultures.</li> <li>2. The students will know how to strategise their content as according to their culture.</li> </ol>
BAJMC-204	APPLICATIONS OF COMPUTER FOR MASS MEDIA	<ol style="list-style-type: none"> <li>1. The students will be able to use the computer applications of media with ease and as per their requirement.</li> <li>2. The knowledge will help the students to be ahead in this dynamic environment and effectively achieve their goals with minimum difficulties.</li> </ol>
	SELECT ANY ONE	
BAJMC-205 A	MEDIA PSYCHOLOGY	<ol style="list-style-type: none"> <li>1. The students will apply the media psychology theories while dealing with media audience and while planning different campaigns.</li> </ol>
BAJMC-205 B	PUNJAB- GENERAL KNOWLEDGE & CURRENT AFFAIRS	<ol style="list-style-type: none"> <li>1. The students will be able to draft and create better content with knowledge about the current situations of the society.</li> <li>2. The regional knowledge of their workplace will put them two steps ahead in the field.</li> </ol>

<b>Code</b>	<b>Course</b>	<b><u>Outcome</u></b>
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BAJMC 301	INTRODUCTION TO BROADCAST MEDIA	1. The students will have a better knowledge about the workings of the broadcast media. 2. The students will be able to differentiate and perform accordingly as regards to the various broadcast media.
BAJMC 302	PRINT MEDIA	1. The students will be able to design a newspaper page or a copy effectively. 2. The students will be able to understand the importance of various elements of the editorial page and the role they play in the newspaper.
BAJMC 303	WRITING FOR MEDIA	The students will be able to effective and relevant content for media.
BAJMC 304	ADVERTISING AND PR	1. The students will be able to make and maintain good relations with different type of publics. 2. The students will be able to make effective and relevant advertising copies after strategising their content and media.
	CHOOSE ANY ONE FROM BAJMC 305 A OR BAJMC 305 B	
BAJMC 305 A	EVENT MANAGEMENT	1.The knowledge about the Indian economy will help students to write better about the various current issues in journalism.
BAJMC 305 B	INDIAN POLITY	1.The knowledge about the political system will make students well sound while writing about various political and social issues.
BAJMC 306	PRACTICAL	1. The students will be able to perform better during the field work.

Code	Course	Outcome
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BAJMC 401	NEW MEDIA	<p>1.The students will be able to use the various applications of new media with ease and as per their requirement.</p> <p>2.The knowledge will help the students to be ahead in this dynamic environment and effectively achieve their goals with minimum difficulties.</p>
BAJMC 402	DEVELOPMENT COMMUNICATION	<p>1.The students will be able to draw a framework about how the media can develop a society with good communication.</p> <p>2.The students will also be able to perform well in the implementation of such development theories and drive conclusions from it.</p>
BAJMC 403	MEDIA ETHICS & LAWS	<p>1.The students will have a handy knowledge about the legality of various issues and how should they be presented in front of the audience.</p> <p>2.The students will be able to comprehend the cultural and regional values and ethics so as to write responsibly about the society.</p>
BAJMC 404	DOCUMENTARY PRODUCTION	<p>1.The students will be able to work upon the minute details needed to turn an idea to a full scale production.</p>
	CHOOSE ANY ONE FROM BAJMC 405 A OR BAJMC 405 B	
BAJMC 405 A	INDIAN ECONOMY	<p>1.The knowledge about the Indian economy will help students to write better about the various current issues in journalism.</p>
BAJMC 405 B	INDIAN POLITICAL SYSTEM	<p>1.The knowledge about the Indian political system will make students well sound and unbiased while writing about various political issues.</p> <p>2.The students will learn to be always updated with the news and make informed decisions.</p>

BAJMC 406	PROJECT	The students will be able to perform better during the field work.
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Code	Course	Outcome
BAJMC-501	GLOBAL MEDIA	1.The students will be able to function well with the understanding of a global scenario. 2. The information about the international issues will help the students to address and relate them at the national level.
BAJMC-502	COMMUNICATION RESEARCH & METHODS	1.The students will be ready to conduct a basic research on the society using various methods or methodologies. 2.The students will be able to draft a full-fledged research report and perform well in academic sector too.
BAJMC-503	PHOTOJOURNALISM	1.The students will be able to click better photographs by understanding the various dynamics of photography. 2.The students will be able to judge the news value of a photograph and write a caption or a feature accordingly.
	SELECT ANY ONE FROM BAJMC 504 A OR BAJMC 504 B	
BAJMC-504 A	INDIA: GENERAL KNOWLEDGE &CURRENT AFFAIRS	1.The knowledge about the Indian Constitution will make students well sound while writing about various political and social issues 2.THE STUDENTS WILL LEARN TO BE ALWAYS UPDATED WITH THE NEWS AND MAKE

		INFORMED DECISIONS.
BAJMC-504 B	MEDIA, GENDER & HUMAN RIGHTS	1. The students will be socially and politically active. 2.The students will be able to highlight and inform people about the issues that are needed to be discussed.
BAJMC 505	PRACTICAL	1. The practical work gives an overview and prepares students for the field work.

<b>Code</b>	<b>Course</b>	<b>Outcome</b>
BAJMC-601	INTRODUCTION TO CINEMA	1.The students will be able to conceptualize old ideas into new productions. 2.The students will be able to work onto the concept of storytelling from a micro to macro level.
BAJMC-602	CYBER JOURNALISM	1.The students will remain updated, tech-savvy and ahead in their field with the knowledge about journalism in the cyber world. 2.The students will be able to use applications and software for easy and effective transmission of content.
BAJMC-603	TV NEWS PRODUCTION	1.The students will be able to draft, write and edit the T.V. news programs. 2.The students will be able to understand their individual and organisational role better in a T.V. production media house or industry.
	SELECT ANY ONE FROM BAJMC 604 A OR BAJMC 604 B	
BAJMC-604 A	INTERNATIONAL: GENERAL KNOWLEDGE & CURRENT AFFAIRS	1.The students will be able to grasp and write well about the national and international issues. 2.The students will easily comprehend the role, relevance and effect of the different International

		organisations on Indian media and society.
BAJMC-604 B	MEDIA INDUSTRY & MANAGEMENT	1.The students will be able to decide and make informed decisions about the content strategy, audience fragmentation, media buying and selling and other elements involved in planning a media campaign.  2.They will perform better managerial and individual roles in an organisation.
BAJMC 605	AUDIO VISUAL PROJECT	1.The students will be able to produce packages, short film and documentaries.

## MAJMC

### Program Educational Objectives (PEO) for Post Graduate Program

#### **Program Name: MASTER OF JOURNALISM AND MASS COMMUNICATION**

#### **Program Code: MA (JMC)**

The program aims are:

**PEO 1.** The course opens many pathways and avenues to choose from and provides a detailed insight about them.

**PEO 2.** The students will be able to foresee the opportunities in and the future of Indian media.

**PEO 3.** The course provides the opportunity to enhance one's communication skills along with other personality skills that will be of great help for the students further in their career.

**PEO 4.** The students will be able to understand the Indian society and the role media is playing in its development in a better way.

**PEO 5.** Students will be able to apply communication principles, models and theories in real- life situations.

**PEO 6.** Students will have an insight of challenges being faced by the Indian Press.

**PEO 7.** Students will be able to apply communication principles, models and theories in real- life situations.

**PEO 8.** Students will get handy knowledge about the various laws and ethics to be followed for the proper functioning of the Press in the society.

**PEO 9.** Students will learn the art of capturing good photographs with keeping in mind the various camera elements like shots, angles, movements and rules.

**PEO 10.** Students will be able to draft and create better content with knowledge about the current situations of the society.

**Program Outcomes (PO) Post Graduate Program (PG)**  
**Program Name: MASTER OF JOURNALISM AND MASS**  
**COMMUNICATION**

**Program Code: MA (JMC)**

After completing Post graduate program in journalism and mass communication, a student will be able:

**PO 1.** To foresee the opportunities in and the future of Indian media.

**PO 2.** To apply communication principles, models and theories in real- life situations..

**PO 3.** To enhance one's communication skills along with other personality skills that will be of great help for the students further in their career.

**PO 4.** To understand the Indian society and the role media is playing in its development in a better way.

**PO 5.** To get handy knowledge about the various laws and ethics to be followed for the proper functioning.

**PO 6.** To learn the process and technicalities of collecting information and then shaping it into a proper structured news story.

**PO 7.** To have an insight of challenges being faced by the Indian Press.

**PO 8.** To apply communication principles, models and theories in real- life situations.

**PO 9.** To get handy knowledge about the various laws and ethics to be followed for the proper functioning of the Press in the society.

**PO 10.** To learn the art of capturing good photographs with keeping in mind the various camera elements like shots, angles, movements and rules.

### Program Specific Objectives (PSO) for Post Graduate Program

#### **Program Name: MASTER OF JOURNALISM AND MASS COMMUNICATION**

#### **Program Code: MA (JMC)**

**PSO 1.** Students will learn to develop ideas and concepts into a full-fledged audio-visual project including writing scripts, framing shots and directing and editing the documentaries or short films.

**PSO 2.** Students will learn to report the events, draft press notes, write stories and capture photographs with news value.

**PSO 3.** Students will be able to have basic knowledge about various techniques required to plan and implement multi-media advertising campaign.

**PSO 4.** Students will learn to design, edit and manage the various elements of a newspaper copy.

**PSO 5.** Students will learn to write scripts and news bulletins for the radio.

**PSO 6.** Students will learn the skills of recording and presenting the radio programmes in various formats.

**PSO 7.** Students will learn the management skills necessary to run a media house.

**PSO 8.** Students will get handy knowledge about the various laws and ethics to be followed for the proper functioning of the Press in the society.

**PSO 9.** Students will learn the art of capturing good photographs with keeping in mind the various camera elements like shots, angles, movements and rules.

**PSO 10.** Students will have the knowledge of regional, national and international affairs and

their impact on the society.

<b>Code</b>	<b>Course</b>	<b>Outcome</b>
MAJMC 101	INTRODUCTION TO MASS COMMUNICATION	<p>1.Students will be able to apply communication principles, models and theories in real- life situations.</p> <p>2.Students will be able to learn and identify communication barriers and techniques to eliminate them.</p> <p>3.Students will be able to improve on their use of media for communication.</p>
MAJMC 102	MEDIA- HISTORY, LAWS & ETHICS	<p>1.Students will understand the role played by the press in the Indian freedom struggle and the overall national development.</p> <p>2.Students will have an insight of challenges being faced by the Indian Press.</p> <p>3.Students will get handy knowledge about the various laws and ethics to be followed for the proper functioning of the Press in the society.</p>
MAJMC 103	PRINT MEDIA I	<p>1.Students will learn the process and technicalities of collecting information and then shaping it into a proper structured news story.</p> <p>2.They will understand the hierarchy and the role of the individual elements of structure of the newspaper.</p>
	SELECT ANY ONE FROM MAJMC 104 A, MAJMC 104 B OR MAJMC 104 C	
MAJMC 104 A	PHOTO JOURNALISM	<p>1.Students will learn the art of capturing good photographs with keeping in mind the various camera elements like shots, angles, movements and rules.</p> <p>2.Students will learn the skills of writing photo features, essays and stories.</p>
MAJMC 104 B	APPLICATIONS OF COMPUTER FOR MASS MEDIA	<p>1.The students will be able to use the computer applications of media with ease and as per their</p>

<u>Code</u>	<u>Course</u>	<u>Outcome</u>
MAJMC 301 MAJMC 201	MASS ADVERTISING COMMUNICATION RESEARCH	1. Students will be able to learn the basic knowledge about various techniques required to plan and implement a multi-media advertising campaign. 2. The knowledge will help the students to be ahead of the race with their competitors.
MAJMC 104 C	DOCUMENTARY/ SHORT FILM MAKING	Students will learn to develop ideas and concepts into a full-fledged audio-visual project including
MAJMC 302 MAJMC 202	TV PRODUCTION PRINT MEDIA II	2. Students will learn to design, edit and manage the various elements of a newspaper copy.
MAJMC	PRACTICAL	Students will learn to report the events, draft press
MAJMC 303 MAJMC 203	CORPORATE RADIO PRODUCTION COMMUNICATION & PR	1. The students will be able to understand the levels and types of communication within the cooperate world. 2. Students will learn the skills of recording and presenting the radio programmes in various formats. how to maintain relations with different type of public.
	SELECT ANY ONE FROM MAJMC 205 OR OR MAJMC 304 B	
MAJMC 204 A	DEVELOPMENT MEDIA MANAGEMENT	1. The students will be able to identify the issues and problems acting as a hindrance to the development of a society and take remedial steps towards it. 2. Students will learn the organisational structure of different media organisations. Communication in the development of a society.
MAJMC 204 B	EVENT MANAGEMENT MEDIA PSYCHOLOGY	1. Students will learn the required skills to plan different types of events and will learn the principles of theories while dealing with media audience and managing them efficiently while planning different campaigns.
MAJMC 205	CURRENT AFFAIRS	1. Students will have the knowledge of regional, national and international affairs and their impact on the society. 2. Students will have the knowledge of Indian Constitution which will further help them in their journalistic career.
MAJMC 207	PRACTICAL	1. Students will learn to design a newspaper from the scratch, present different formats of radio programmes and design advertisements for various media.

Code	Course	Outcome
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MAJMC 401	NEW MEDIA	<p>1. The students will be able to realize the scope of New Media in today's world.</p> <p>2. The students will be able to write and design effective content on New Media.</p>
MAJMC 402	FILM PRODUCTION & STUDIES	<p>1. The students will be acknowledged about the background of the Indian cinema.</p> <p>2. The students will be able to conceptualize a film with the understanding of screen grammar, production phases and other technicalities.</p>
MAJMC 403	INTERCULTURAL & INTERNATIONAL COMMUNICATION	<p>1. The students will be able to identify the techniques to effectively communicate with their audience per their cultural values and systems.</p> <p>2. The students will be able to maintain a proper balance between their content and cultural and global ethics.</p>
	SELECT ANY ONE FROM MAJMC 404 A OR MAJMC 404 B	
MAJMC40 4 A	MEDIA & SOCIETY	<p>1. The students will be able to use effective communication and media tools for proper dissemination of values and Social norms in the society.</p> <p>2. The students will be able to choose their media strategies and content as regard to the society accordingly.</p>
MAJMC40 4 B	INDIAN ECONOMY	<p>1. The knowledge about the Indian economy will help students to write better about the various current issues in journalism.</p>
MAJMC 405	DISSERTATION	<p>2. The students will be able to conduct a full fledged research and draft a report on it.</p>
MAJMC 406	PROJECT	<p>1. The students will be able to polish their skills further in their area of the specialization.</p>

**Program Name: - BACHELOR OF BUSINESS  
ADMINISTRATION**

**Program Code :- BBA**

**Program Educational Objectives (PEO)**

The program aims are

**PEO 1.** Inculcating in-depth knowledge about various management concepts and functional areas of management in context of business and corporate world.

**PEO 2.** Developing necessary communication, interpersonal, Team work and leadership skills so as to able to take up various responsibilities in Business world.

**PEO 3.** Creating awareness about various social and ethical issues which will enable students to become ethical and responsible towards their Organization, Society and Nation.

**PEO 4.** Making the students recognize and understand the ever changing global retail environment and develop aptitude and ability to adapt to this ever changing environment.

**PEO 5.** Developing entrepreneurial mindset among students and thus start their own business ventures.

**Program Name: - BACHELOR OF BUSINESS  
ADMINISTRATION**

**Program Code :- BBA**

**Program Outcomes (PO)**

After completing undergraduate program in management studies, a student will be able to

**PO 1.** Gain theoretical insight into managerial concepts theories and models

**PO 2.** To apply conceptual knowledge and skills learnt into practical business world

**PO 3.** Achieve higher levels of verbal and non-verbal communication and presentation skills

**PO 4.** Able to demonstrate ethical and professional work style

**PO 5.** Understand the importance and relevance of entrepreneurship and shall be motivated to set up their own ventures

**PO 6.** Develop a foundation for pursuing higher education in the field of management studies.

**Program Name: - BACHELOR OF BUSINESS  
ADMINISTRATION**

**Program Code :- BBA**

**Program Specific Outcomes (PSO)**

**PSO 1.** To make the students understand the dynamic, competitive and complex global business environment.

**PSO 2.** To impart basic and operational knowledge on all functional areas of management making the program convergently unique.

**PSO 3.** To equip the students with theoretical knowledge along with the necessary practical skills for management of business organization.

**PSO 4.** To develop conceptual and analytical abilities required for effective decision making in ever changing business environment.

**PSO 5.** The program intends to train the students to become competent enough for entry level management professionals in business and corporate world.

**PSO 6.** To make the students aware about the corporate social responsibility so that they can contribute towards betterment of society.

**PSO 7.** To sensitize the students about business and professional ethics so that they are able to develop themselves into ethical decision makers.

**PSO 8.** To make the students understand the environmental challenges being faced by the human race and enable them to identify solutions to these challenges.

**Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
(BBA-101)	Environmental and Road Safety Awareness Studies	<ul style="list-style-type: none"><li>• Understand the core concepts and methods from ecological and physical sciences and their application in environmental problem solving.</li><li>• Recognize concepts and methods from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.</li><li>• Appreciate the ethical, cross-cultural, and historical context</li></ul>

		<p>of environmental issues and the links between human and natural systems.</p> <ul style="list-style-type: none"> <li>• Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.</li> <li>• Students can identify safe and unsafe practices of pedestrians, passengers and cyclists.</li> <li>• Students demonstrate knowledge of traffic law relevant to them, and to other road users they may encounter.</li> <li>• Students develop skills to identify and respond to traffic hazards.</li> <li>• Students understand the importance of being a good role model to others when using the road.</li> </ul>
(BBA-102)	<b>Communication skills in Punjabi</b>	<ul style="list-style-type: none"> <li>• Acquire the basic understanding of state language Punjabi and cultural values of Punjab</li> <li>• Learn the vernacular concepts of business and its importance in the region.</li> <li>• Acquire the language proficiency</li> </ul>

		to communicate the local regional customers in the local language.
BBA-104	Theory and Practice of Management	<ol style="list-style-type: none"> <li>1. To help the students in understanding of the functions and responsibilities of managers</li> <li>2. To understand the concepts related to Management.</li> <li>3. To demonstrate the roles, skills and functions of management.</li> <li>4. To help the students to develop cognizance of the importance of management principles</li> <li>5. To enable them to analyze and understand the environment of the organization</li> </ol>
BBA-GE (I)	Professional Ethics	<ol style="list-style-type: none"> <li>1. The students will understand the basic perception of profession, professional ethics, various moral &amp; social issues, industrial standards, code of ethics and role of corporate ethics.</li> <li>2. The students will aware of functional ethics and responsibilities according to functions of business.</li> <li>3. The students will acquire knowledge about variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives.</li> <li>4. They will understand about role of business ethics a Developing Civilised Society and also about CSR.</li> </ol>
BBA-GE (II)	Entrepreneurship Development	<ol style="list-style-type: none"> <li>1. Have the ability to discern distinct entrepreneurial traits.</li> <li>2. To know the parameters to assess opportunities and constraints for new business ideas.</li> <li>3. To Understand the systematic process to select and screen a business idea.</li> <li>4. To design strategies for successful implementation of ideas and write a business plan.</li> </ol>

		<ol style="list-style-type: none"> <li>5. To understand about business venture and practically how to start-up a business.</li> </ol>
BBA-GE (III)	Corporate Communication	<ol style="list-style-type: none"> <li>1. Apply corporate communication strategies and principles to prepare effective communication for domestic and international business situations.</li> <li>2. Identify ethical, legal, cultural, and global issues affecting business communication.</li> <li>3. Utilize analytical and problem-solving skills appropriate to business communication.</li> <li>4. Participate in team activities that lead to the development of collaborative work skills.</li> </ol>
BBA-GE (IV)	Managing Small and Medium Business Enterprises	<ol style="list-style-type: none"> <li>1. Understand the importance of defining the right strategy for the SME in a fast-changing world and to apply specific tools, models and processes.</li> <li>2. Understand the importance of the three Pillars for Success: Strategy - Execution - HR and to assess their effectiveness at specific case studies.</li> <li>3. Understand the Opportunities and Risks of Internationalisation and Strategic Options for accessing global markets.</li> <li>4. Understand the importance of values at an SME for their sustainability and their innovation capacity.</li> </ol>
BBA-GE (V)	Organisational Behaviour	<ol style="list-style-type: none"> <li>1. To understand the concept of Organisational Behaviour</li> <li>2. To learn about various theories of Organisational Behaviour</li> <li>3. To understand the by there is need to</li> </ol>

		understand the behaviour of personals working in the organisation.
BBA-GE (VI)	Insurance Management	<ol style="list-style-type: none"> <li>1. To understand the concepts of insurance.</li> <li>2. To know about the importance of the insurance.</li> <li>3. To understand latest policies issued by different companies.</li> <li>4. To know about the role of IRDA</li> </ol>
BBA-GE (VII)	Business Mathematics and Statistics	<ol style="list-style-type: none"> <li>1. Identify situations in which Math and Stats can be used effectively to aid managerial decision-making and planning.</li> <li>2. Select and apply appropriate techniques to solve particular optimisation problems.</li> <li>3. Develop analytical skills in applying a scientific approach to structure and solve managerial problems.</li> <li>4. Develop statistics skills in using a range of business.</li> </ol>
BBA-GE (VIII)	India's Diversity and Business	<ol style="list-style-type: none"> <li>1. Gain a heightened understanding of and appreciation for Indian Peoples, their sovereign status, along with their cultural, spiritual, aesthetic, literary, philosophical, social/family, political, and economic/subsistence expressions, and, as well as the diversity of those expressions within the contemporary world. Each tribal community is to be appreciated for its uniqueness and individuality.</li> <li>2. Learn about the unique cultural traditions and world view, as well as realize the common threads of our</li> </ol>

		shared humanity, transcending the cultural differences between Indian and non-Indian communities, and between Indian communities.
(BBA-204)	<b>Organisational Behaviour</b>	<ul style="list-style-type: none"> <li>• Understand the role of organisational behaviour in organizations and the factors shaping that behaviour.</li> <li>• Understand key concepts and theories from the field of personality, motivation, learning .</li> <li>• Apply key course concepts to actual problems of interpersonal behavior in organizations.</li> <li>• Understand the communications and its role in organisational behavior.</li> </ul>
(BBA-207)	<b>Viva-Voce</b>	<ul style="list-style-type: none"> <li>• Develop a thorough understanding of the chosen subject area.</li> <li>• Demonstrate the ability to collate and critically assess/interpret data.</li> <li>• Develop an ability to effectively communicate knowledge in a scientific manner.</li> <li>• Provide recommendations based on research findings.</li> </ul>
(BBA-301)	<b>Principle of Marketing Management</b>	<ul style="list-style-type: none"> <li>• Formulate a marketing plan including marketing objectives, marketing mix, strategies, budgetary considerations and evaluation criteria.</li> <li>• Write a business plan for an entrepreneurial start-up venture.</li> <li>• Develop pricing strategies that take into account perceived value, competitive pressures and corporate objectives.</li> </ul>

		<ul style="list-style-type: none"> <li>• Develop strategies for the efficient distribution of products and services.</li> <li>• Apply the principles of business ethics and corporate social responsibility.</li> <li>• Determine strategies for developing new products and services that are consistent with evolving market needs.</li> <li>• Evaluate the viability of marketing a product or service in an international market or markets.</li> <li>• Evaluate results of marketing activities using criteria related to budgeted sales, costs and profits.</li> </ul>
BBA-303	Human Resource Management	<ol style="list-style-type: none"> <li>1. To understand the concepts related to Human resource Management</li> <li>2. To help the students in understanding different aspect of HRP</li> <li>3. To provide fundamental knowledge of managing career.</li> <li>4. To familiarize the students with the basic of Managing Separations</li> </ol>
BBA-403	Business Law	<ol style="list-style-type: none"> <li>1. To understand the concept of law applicable in the business.</li> <li>2. To understand the latest guideline issued by the government in context of different law.</li> <li>3. To aware about the policies followed by the business in the direction of law.</li> </ol>

BBA-501	Financial Management	<ol style="list-style-type: none"> <li>1. The students will understand the basic concept of finance and financial management</li> <li>2. The students will aware of financial planning</li> <li>3. The students will acquire knowledge about capital budgeting and working capital management</li> <li>4. They will understand Dividend policy used by the corporate</li> </ol>
BBA-601	Financial Institution and Services	<ol style="list-style-type: none"> <li>1. The students will understand the basic concept of financial services</li> <li>2. The students will aware of fixed and variable interest bearing security</li> <li>3. The students will acquire knowledge about the merchant banking</li> <li>4. They will understand about hire purchase</li> </ol>
BBA-DSE I (A)	Management Accounting	<ol style="list-style-type: none"> <li>1. Each student shall have a thorough understanding of basic management accounting concepts and be able to apply this understanding to business</li> </ol>

		<p>situations.</p> <ol style="list-style-type: none"> <li>2. To demonstrate the need for a balance between financial and non-financial information in decision making, control and performance evaluation applications of management accounting;</li> <li>3. To improve the knowledge of the students regarding operations of organisations through the application of management accounting techniques</li> </ol>
BBA-DSE I (B)	Income Tax	<ol style="list-style-type: none"> <li>1. To introduce the basic concept of Income Tax.</li> <li>2. To familiarize the students with heads of income with its components.</li> <li>3. It should help students to build an idea about income from house property as a concept.</li> <li>4. It gives more idea about the income from business or profession.</li> </ol>
BBA-DSE I (C)	Financial Institution and Markets	<ol style="list-style-type: none"> <li>1. To provide an introduction to the financial markets.</li> <li>2. To analyze the role of financial markets for the broader macro</li> </ol>

	<p>economy.</p> <ol style="list-style-type: none"> <li>3. To help them to understand the practical aspects of primary and secondary market operations.</li> <li>4. The subject will help them in building career in stock market/broking houses.</li> </ol>
<p>BBA-DSE I (D)</p>	<p>Investment Management</p>
	<ol style="list-style-type: none"> <li>1. To explore the theory and practice of investments, covering the topic areas of capital market structure, valuation, security analysis and portfolio management.</li> <li>2. This subject will emphasize an understanding of the economic forces that influence the pricing of financial assets.</li> <li>3. To understand of investment theory will be stressed and tied in with discussion of applicable techniques such as portfolio selection.</li> <li>4. The subject will cover formulae that can be applied in different business situations, a primary objective of this course will be to learn the concepts behind the formula.</li> </ol>

BBA-DSE II (B) Service Marketing		<ol style="list-style-type: none"> <li>1. To provide the students with appreciation of concepts, functions, and techniques of the craft of marketing services.</li> <li>2. To help them in demonstrating ability in evaluating service designs and in understanding of the challenges inherent in managing and delivering quality services.</li> <li>3. To promote a customer service-oriented mindset.</li> <li>4. To know the Service Sector and apply the 7 P's of Service Marketing.</li> <li>5. Understand the consumer behaviour in Service Sector. Set standard and measure service quality and productivity</li> </ol>
BBA-DSE II (C)	Retail Management	<ol style="list-style-type: none"> <li>1. To provide Conceptual knowledge about rural marketing with special reference to Indian context.</li> <li>2. They will understand the Rural market distribution.</li> <li>3. To know about the consumer behaviour and trends in Rural marketing.</li> </ol>
BBA-DSE II (D)	Brand and Product Management	<ol style="list-style-type: none"> <li>1. Students should be able to apply the fundamental concepts of product and brand development and management.</li> <li>2. Students should be able use the brand positioning framework to develop a brand, keep it relevant, expand a brand internationally, and reposition a brand.</li> </ol>

		<ol style="list-style-type: none"> <li>3. To recognize the importance of using teams and organization to coordinate multiple interdisciplinary tasks in order to create and manage products within an organization.</li> <li>4. Students should be able use portfolio analysis and the product life cycle to understand how a firm manages its product mix.</li> </ol>
BBA-DSE III (A)	CAREER PLANNING & MANAGEMENT	<ol style="list-style-type: none"> <li>1. Students should be able to Better manage your own careers in general and prepare your job search process in particular.</li> <li>2. Conceptualize, implement, and complete a project in a team.</li> <li>3. Articulate awareness and insights about your strengths and growth areas and develop practical strategies to apply these insights in managing your own career development.</li> <li>4. Identify and describe a career path that best suits your values, interests, personality, and skills.</li> <li>5. Develop an in-depth understanding of theory and research in career development.</li> </ol>
BBA-DSE III (B)	TRAINING AND DEVELOPMENT	The students should be able to understand the need for training and development and various methods of training and development.
		Possess the knowledge of various retail formats and value of induction process.
		They will understand the retail customer.

BBA-DSE III (C)	Management of Change	<ol style="list-style-type: none"> <li>1. The students will understand the basic concept organisational change and its models</li> <li>2. The students will aware about the strategies for change</li> <li>3. The students will acquire knowledge about Organizational culture.</li> <li>4. They will understand Issues in consultant-client relationship.</li> </ol>
BBA-DSE III (D)	Management of Industrial Relations	<ol style="list-style-type: none"> <li>1.</li> <li>2. Establish and foster sound relationship between workers and management by safeguarding their interests.</li> <li>3. Avoid industrial conflicts and strikes by developing mutuality among the interests of concerned parties.</li> <li>4. Keep, as far as possible, strikes, lockouts and gheraos at bay by enhancing the economic status of workers.</li> <li>5. Raise productivity in the organization to curb the employee turnover and absenteeism..</li> <li>6. To understand the concept of Industrial Relation and Trade Union</li> </ol>
BBA-DSE IV (A)	Search Engine Optimization	<ol style="list-style-type: none"> <li>1. The students will understand the Programmer and Search Engine Marketer</li> <li>2. The students will aware about the</li> </ol>

		<p>basic SEO</p> <ol style="list-style-type: none"> <li>3. The students will acquire knowledge about the causes and effects of duplicate content.</li> <li>4. They will understand the technical analysis of Black-Hat Techniques.</li> </ol>
BBA-DSE IV (B)	E-Commerce	<ol style="list-style-type: none"> <li>1. Students are able to understand regarding the principles of office management</li> <li>2. Learn about the authorities and responsibilities of an office manger</li> <li>3. Students are able to understand about the importance of record in office and also learned about its maintenance</li> </ol>
BBA-DSE IV (C)	Data Management System	<ol style="list-style-type: none"> <li>1. Students are able to understand regarding the database management system</li> <li>2. Learn about the data language, data models</li> <li>3. Students are able to understand about the Entity relationship model and Database design and its process</li> </ol>
BBA-DSE IV (D)	Software Engineering	<ol style="list-style-type: none"> <li>1. To understand about the software engineering and software crisis.</li> <li>2. Students are able to understand regarding the recent trends in</li> </ol>

		<p>software engineering</p> <ol style="list-style-type: none"> <li>3. Students are able to understand Object Oriented Design using UML</li> <li>4. To understand the concept of software documentation</li> </ol>
BBA-DSE V (A)	Event Planning and Management	<ol style="list-style-type: none"> <li>1. To obtain a sense of responsibility for the multi-disciplinary nature of event management</li> <li>2. To gain confidence and enjoyment from involvement in the dynamic industry of event management</li> <li>3. To identify best practice in the development and delivery of successful conference and corporate gatherings</li> <li>4. To identify the key elements of a conference and the processes involved in venue selection, registration, catering, accommodation, transport, theming, security and entertainment</li> <li>5. To identify management essentials such as developing budgets, critical paths, work breakdown structures, risk mitigation and contingency planning.</li> </ol>
BBA-DSE V (B)	Financial Management of Events	<ol style="list-style-type: none"> <li>1. To Identify the need of event financial management</li> <li>2. To know about the elements which helps in Managing events</li> <li>3. To know about the financial appraisal of event</li> <li>4. To identify the categories for an event expenses</li> <li>5. To identify the structure of event</li> </ol>

		management fees
BBA-DSE V (C)	Event Resource Management	<ol style="list-style-type: none"> <li>1. To understand the process of managing and marketing events from conceptualization, planning, and feasibility analysis to staging the event, and post event evaluation</li> <li>2. To learn the concept of entertainment, its purpose, forms, its timing.</li> <li>3. To know how performers work, their mindset, performance needs.</li> <li>4. To get the knowledge of Décor design theory, their set up considerations prior to and after the event.</li> <li>5. To identify how the electrical distribution works with regard to safety.</li> </ol>
BBA-DSE V (D)	Event Proposal and Marketing	<ol style="list-style-type: none"> <li>1. To understand the proposal request process.</li> <li>2. To learn about how to make itinerary, its transportation costs sheet, company's profile.</li> <li>3. To know about event promotion techniques, it's costing</li> <li>4. To get the knowledge of that how the events design their</li> </ol>

		promotion and sponsorship.
BBA-DSE VI (A)	Principle of Mass Communication	<ol style="list-style-type: none"> <li>1. To understand the concept in Mass Communication</li> <li>2. To learn about 7 C's of Communication</li> <li>3. To know about the tools of Mass Communication</li> <li>4. To get the knowledge of different models of Mass Communication</li> <li>5. To know the theories of communication</li> </ol>
BBA-DSE VI (B)	Public Relation Management	<ol style="list-style-type: none"> <li>1. To understand the concept Public Relations</li> <li>2. To learn about PR and its allied disciplines</li> <li>3. To know about Public Relations in government and Private sector</li> <li>4. To get the knowledge of IPRA code</li> </ol>

BBA-DSE VI (C)	Media Management	<ol style="list-style-type: none"> <li>1. To make students aware about the responsibilities, structure of Media Management</li> <li>2. Students will be able to analyze individual media businesses and understand the Economic drivers of the media economy.</li> <li>3. Students will have developed hands-on experience as content marketers using Journalistic and digital techniques.</li> <li>4. Students will gain a perspective on the ownership patterns of mass media and evolution of media on key current trends and its media audiences.</li> </ol>
BBA-DSE VI (D)	Corporate Communication	<ol style="list-style-type: none"> <li>1. To understand the role of communication in traditional and modern media in development.</li> <li>2. To discuss various paradigms of communication message development, channels, promotion strategies to be used.</li> <li>3. To learn the Indian experiences in Communication for Development</li> <li>4. To develop an understanding of the concept of communication budget, communication effectiveness.</li> <li>5. To understand the guidelines related to corporate communication</li> </ol>

**Program Name: - MASTER OF BUSINESS ADMINISTRATION**

**Program Code :- MBA**

**Program Educational Objectives (PEO)**

The program aims are

**PEO 1.** To equip students with conceptual knowledge about various functional areas of management

**PEO 2.** To inculcate innovative creative and entrepreneurial mindset among the students

**PEO 3.** To improve communication, presentation, interpersonal, decision making and leadership skills of the students

**PEO 4.** To enable students to use functional knowledge and practical skills learnt during the program in identifying and solving problems of business and corporate world

**PEO 5.** To create awareness about importance of human values, professional ethics and value-based leadership in the business world

**Program Name: - MASTER OF BUSINESS ADMINISTRATION**

**Program Code :- MBA**

**Program Outcomes (PO)**

After completing Post graduate program in management studies, a student will be

**PO 1.** Possessing the understanding of conceptual knowledge and practical skills required for corporate world

**PO 2.** Able to select and apply management concepts, theories and models for discharging their job roles in the industry

**PO 3.** Possessing requisite communication skills, teamwork and leadership skills and will be able to effectively discharge their responsibilities in the industry

**PO 4.** Able to explore identify and evaluate feasible business ideas and set up their entrepreneurial ventures

**PO 5.** Aware of environmental and societal concerns and be able to develop sustainable business models

**Program Name: - MASTER OF BUSINESS ADMINISTRATION**

**Program Code :- MBA**

### **Program Specific Outcomes (PSO)**

**PSO 1.** To equip the students with requisite conceptual knowledge, necessary skills and positive attitude required for becoming successful managers in global business environment.

**PSO 2.** To develop effective communication and presentation skills required to be a successful business professional.

**PSO 3.** To prepare the students to meet the diverse challenges of global business environment by equipping them with knowledge about various functional areas of management.

**PSO 4.** To develop and understanding of business and professional ethics so as to be able to align organizational goals with ethics.

**PSO 5.** To hone entrepreneurial skills and mindset in the students.

**PSO 6.** To inculcate managerial competencies among the students so that they become employable in current dynamic business world.

**PSO 7.** To develop skill of being a lifelong learner so that they can successfully discharge their responsibilities in future.

**Course Outcome:**

COURSE CODE	COURSE	COURSE OUTCOME
MBA-101	Management Practices & Organization Behaviour	After successful completion of this course , the students shall be able to: 1. Understand the various Concepts of Management. 2. Understand Planning, Organizing, Staffing, Directing and Controlling Functions of Management. 3. Understand of the Contemporary Management Practices in terms of Motivation and Communication. 4. Develop peer based Learning and Working in Groups and Teams.
MBA-102	Accounting for Management	After successful completion of this course , the students shall be able to: 1. Understand the basic Concepts, Principles and Process of Accounting and to make them aware about the formats of Financial Statements. 2. Understand the concepts of Cost and various intricacies for preparing the Cost Sheet. 3. Understand the Decision Making Techniques using the concepts of Marginal Costing, Standard Costing And Budgetary Control. 4. Understand the contemporary developments in the Accounting.
MBA-103	Business Environment	After successful completion of this course , the students shall be able to: 1. Learn impact of Legal & Regulatory, Cultural, Political, Technological, Global And Natural Environment On Business Enterprise. 2. Understand the concept of Goods And Service Tax. 3. Discuss various development strategies in

		India.
MBA-104	Economic Analysis for Business Decisions	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Understand the basic concepts of Economics and relate it with other disciplines and identify the importance of Economics in managerial decision making.</li> <li>2.Recognize the relationship between Short-Run and Long-Run costs and will also be able to establish the linkage between Production Function and Cost Function</li> <li>3.Compare and contrast four basic types of market i.e. Perfect, Monopoly, Monopolistic ,Oligopoly and can determine Price and Output under different market types.</li> <li>4.Understand basic concepts of Macroeconomics and shall be able to measure National Income using different approaches.</li> </ol>
MBA-105	QUANTITATIVE TECHNIQUES IN MANAGEMENT	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Apply the concepts of Central Tendency and Variation in Managerial Decision Making</li> <li>2.Understand the concept of Correlation Regression Analysis and their Applications.</li> <li>3.Enhance knowledge in Probability Theory and Normality and its Distribution concepts</li> <li>4.Apply the learnt techniques to build the best fit route of Transportation for carrying schedule of activities.</li> <li>5.Understand the concept of Linear Programming and their Applications.</li> </ol>
MBA-106 (a)	Software Lab (Office Automation)	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Learn basic Word Processing.</li> <li>2.Learn Presentation, Graphics, Software skills.</li> <li>3.Learn basic Spreadsheet and statistics formula used in Spreadsheet</li> <li>4.Understand the concept of Database Management system</li> <li>5.Understand basics of E-commerce.</li> </ol>
MBA-107 (b)	Workshop on Executive Communication	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Learn Communicate effectively.</li> <li>2.Boost the confidence and help them to present their thoughts clearly.</li> </ol>

		<p>3.Learn the role of body language as a non-verbal tool of communication</p> <p>4.Learn presentation skills.</p>
MBA-107	Seminar on Environmental Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Develop an understanding towards basic presentation skills.</li> <li>2.Understand the use of relevant and contemporary Software packages as part of the presentation.</li> <li>3.Understand the various Environment Issues In Business Management.</li> </ol>
MBA-201	Research Methodology	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Understand Research Problem, Research Process and Research Methods.</li> <li>2.Develop the skills to identify the appropriate Statistical Techniques for the analysis of data</li> <li>3.Design a good Quantitative Purpose Statement and good Quantitative Research Questions and Hypotheses.</li> <li>4.Understand the various types of Quantitative Sampling Techniques and conditions to use.</li> <li>5.Understand effective Report Writing skills.</li> </ol>
MBA-202	Marketing Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Learn the basics of Marketing, Selling, Marketing Mix and its Core Concepts</li> <li>2.Understand the intricacies of the Marketing Environment and Marketing Information Systems for effective Marketing Planning and Strategies.</li> <li>3.Equip them self with necessary skills for effective Market Segmentation, Targeting and Positioning.</li> <li>4. Understand the various components of Product Mix, Product Life Cycle and The New Product Development Process.</li> <li>5. Gain knowledge about the emerging trends in Marketing.</li> </ol>
MBA-203	Financial Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Explain the Evolution, Objectives and Functions of Corporate Finance and Interface</li> </ol>

		<p>of Corporate Finance with other functional areas.</p> <p>2.Illustrate the concept of Time Values of Money and Valuation of Securities.</p> <p>3.Understand the applications of Approaches of Working Capital Management</p> <p>4.Understand Mergers and Acquisitions, Motives, Legal Procedure and Evaluation.</p>
MBA-204	Production& Operations	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Understand growing importance of Production and Operations management in uncertain Business Environment.</p> <p>2.Examine the issues related to Designing and Managing Operations</p> <p>3.Understand the concepts of Inventory and Purchasing Management.</p>
MBA-205	Management of Human Resources	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Explain the basics of Human Resource Management and analyse the evolution of HRM</p> <p>2.Appraise various functions of HRM that facilitate Employee Hiring viz. Human Resource Planning, Job Analysis Recruitment and Selection.</p> <p>3.Understand the role of Training, Development, Career Planning and Performance Appraisal functions in Human Resource Development.</p> <p>4.Facilitate the development of better understanding of Human Resources issues as they relate to other Managerial Functions.</p>
MBA-206	Workshop on Tally.ERP 9	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Become familiar with the Organization format of Tally ERP.</p> <p>2.Use technology in managing the Accounts of a company.</p> <p>3.Use information generated through tally software.</p>
MBA-207	Seminar on Business Ethics	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Develop an understanding towards basic presentation skills.</p> <p>2.Use the relevant and contemporary software</p>

		packages as part of the presentation. 3.Understand the environmental issues in Ethics and Ethical Dilemmas in Business Management.
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COURSE CODE	COURSE	COURSE OUTCOME
MBA-301	Strategic Management	After successful completion of this course , the students shall be able to: 1.Focus on the link between Strategic Analysis and Strategic Management, Interdependence of Strategic Analysis. 2.Develop the skills of various perspective and concepts in Strategic Management. 3.Develop the skills for applying the concepts for solving business problems. 4.Use analytical tools of Strategic Management and business policy.
MBA-302	Project Management	After successful completion of this course , the students shall be able to: 1.Understand suitable framework for gaining insight in the Process of Preparation, Appraisal, Monitoring and Control of a Project. 2.Focuses on the role of Project Management Techniques and how to mobilize finance for domestic and international projects. 3.Understandthe underlying concepts, strategies and issued involved in the management of project's risk.
MBA-303	Advertising and Sales Management	After successful completion of this course , the students shall be able to: 1.Understand Objectives, Nature & Scope, Sales Environment, Sales Planning, and Strategic role of Sales Management. 2.Analyzes the Sales Force, Recruitment, selection and training the sales force. 3. Understand Sales Planning, Sales Forecasting, Budgeting , Sales Quotas and Targets. 4.Understand Rules and Techniques of Effective Advertising
MBA-304	Consumer Behaviour	After successful completion of this course , the students shall be able to: 1.Understand Environmental Influences on Consumer Behavior 2.Illustrate Influence of Marketing Mix Variables, 3.Understand Individual Determinants of Consumer Behavior and formulation of Consumer Attitude.

MBA-305	Management of Industrial Relations	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.To understand various act related to Labour welfare.</li> <li>2.Understand causes of industrial dispute and dispute settlement methods.</li> <li>3.Have an insight into emerging trends in industrial relations and latest amendments in labour legislation.</li> </ol>
MBA-306	Human Resource Development	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Critically explain and apply the principles and methods of strategic workforce planning and its practical application in contemporary contexts.</li> <li>2.Critically explain and apply the theoretical background and conceptual tools used in designing and implementing staff development programs/initiatives.</li> <li>3.Demonstrate an in-depth understanding of the learning organization and its fundamental philosophy and practice.</li> <li>4.Apply relevant theories and concepts to case examples or to their own workplace.</li> </ol>
MBA-307	Security Analysis and Portfolio Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Define the concept of investment management and different alternatives of investment</li> <li>2.Understand the role of Risk – Return Framework and economy , industry and company analysis.</li> <li>3.Discuss Technical Analysis and Capital Asset Pricing Model</li> <li>4.Understand Portfolio Management.</li> </ol>
MBA-308	Financial Services and Markets	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Know about the meaning,importance and functions of financial system.</li> <li>2.Understand financial markets money market and capital market.</li> <li>3.To have an understanding of concept, nature and scope of financial services and financial institutions in India.</li> </ol>
MBA-309	Production Planning and Control	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Understand the problems and opportunities faced by the operations manager in Manufacturing And Service Organizations.</li> <li>2.Develop an ability to apply PPC concepts in a various areas like Sampling Plans. Dispatching and Expediting, Recording progress and feedback.</li> </ol>

		3. Examine several classic Operations Management planning topics including production planning and inventory control.
MBA-310	Inventory Management & Control	After successful completion of this course , the students shall be able to: 1.Integrate operations concepts with other functional areas of business 2.Examine several classic Operations Management planning topics including inventory control, Safety Stock, Standard Order Quantity. 3.Understand various techniques related to inventory management such as Materials Handling & Warehouse Management and JIT.
MBA-311	Database Management System	After successful completion of this course , the students shall be able to: 1. Understand database concepts and structures and query language. 2.Understand the E R model and relational model 3. Design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS. 4.Understand Functional Dependency and Functional Decomposition. 5.Apply various Normalization techniques.
MBA-312	Web Designing	After successful completion of this course , the students shall be able to: 1.Understand Static and Dynamic concepts of web designing. 2.Introduce the basic elements of web page designing 3. Design web pages that apply various dynamic effects on the web site. 4.Solve complex and large problems using Scripting Language & Markup Language.
MBA-313	Foreign Exchange Management	After successful completion of this course , the students shall be able to: 1.Understand International Trade Policy and Foreign Exchange 2.Understand World Financial Environment ,Spot rate, Forward rate Direct & Indirect quote 3. Elaborate Economic, Transaction and Translation Exposure 4.Explain Multinational Cash Management. International Taxation.
MBA-314	Global Marketing Management	After successful completion of this course , the students shall be able to:

		<p>1.Understand emergence of Trading Blocks like E.U. and steps/stages involved in their formation (Customs union to common currency).</p> <p>2.Express the role of International Institutions like IMF, WTO, IBRD</p> <p>3.Analysis international Product life-Cycle, Promotion and Pricing in International marketing.</p>
MBA-315	Management of Retail Organisation	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Apply a broad theoretical and technical knowledge of Retail Management to understand opportunities and challenges for creating excellent retailing experience.</p> <p>2.Make analysis of Market Information to assess the Retailing Environment and Formulate Effective Retail Strategies.</p> <p>3.Learn how to procure, display and maintain merchandise to meet daily business requirements.</p>
MBA-316	Store Management	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Understand basics of Store Management and Roles and Responsibilities of Store Managers.</p> <p>2.Make Critical analysis of Cost Controls - Labor scheduling, Store Maintenance, Reducing inventory shrinkage,</p> <p>3.Understand Marked Area Analysis - Factors Affecting Attractiveness of Market Areas and Trade Areas.</p>
MBA-317	Agricultural Finance	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Understand in detail about Agriculture Finance and International Trends in Agribusiness.</p> <p>2.Learn legal formalities regarding issue loan and interest rate .</p> <p>3.Understand role of Institutions in Agri-Finance - Public and Private Sector Banks.</p>
MBA-318	Agricultural Marketing	<p>After successful completion of this course , the students shall be able to:</p> <p>1. Classify Agriculture markets, its components and dynamics of market structure.</p> <p>2.Explain Packaging and its Impact on Selling.</p> <p>3.Understand Marketing Channels: Distribution Channels, Marketing Agencies and Marketing Institutions.</p>
MBA-401	Organisational Development & Change	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Facilitate Organizational Change; and apply</p>

		<p>diagnostic models and concepts to change issues at the organizational, group and individual levels.</p> <p>2. Understand concepts related to system theory, Action Research and Models,</p> <p>3. Examine various issues in the relationship between Client and Consultant Relationship.</p> <p>4. Understand the role of various Intervention strategies in Organizational Development.</p>
MBA-402	Research Project Report in Major Areas of Specialisations	<p>After successful completion of this course , the students shall be able to:</p> <p>1. Gain deeper understanding in specific areas.</p> <p>2. Develop Research Aptitude</p> <p>3. Prepare project report with assigned topics.</p> <p>4. Expand knowledge base with Literature Review on the current topic</p>
MBA-403	Seminar on Project Report	<p>After successful completion of this course , the students shall be able to:</p> <p>1. Develop an understanding towards presentation skills.</p> <p>2 Use the relevant and contemporary software packages as part of the presentation.</p> <p>3. Apply research test to various problems pertaining to research area.</p>
MBA-405	Marketing Research	<p>After successful completion of this course , the students shall be able to:</p> <p>1. Know about the Meaning &amp; role of Marketing Research</p> <p>2. Design Questionnaires &amp; Observation forms for different Marketing Research Situations</p> <p>3. Solve the case studies on Sampling Decisions like Defining Universe, Sampling Unit, Sampling Element, Choice of Sampling Frame, Determining Sample Size for Probability &amp; Non-Probability Sampling Methods</p> <p>4. Know about the Experimentation in Marketing Research and Interpretation of Data.</p> <p>5. Test and develop Interpretation of the hypothesis with the techniques like Chi Square Test, Conjoint Analysis.</p>
MBA-406	Digital Marketing	<p>After successful completion of this course , the students shall be able to:</p> <p>1. Understand fundamentals of Digital Marketing and difference between Traditional and Digital Marketing Communication.</p> <p>2. Learn Online Consumer Behavior and Segmentation.</p> <p>3. Explain E-CRM and approaches to its</p>

		<p>implementation.</p> <p>4.Understand future challenges of Digital Marketing and E-Payment System.</p>
MBA-407	Marketing of Services	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Know about the Definition, Significance, Characteristics of Services</li> <li>2.Frame Extended Marketing Mix for Services, Traditional Marketing Mix Elements in Services</li> <li>3.Explain Service Process</li> <li>4.Illustrate People &amp; Physical Evidence</li> <li>5.Demonstrate Applications of Service Marketing: like Tourism, Hospitality, Airlines, etc.</li> </ol>
MBA-408	International Logistics	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Prepare, explain Logistics Documentation like Commercial Invoice, Certificate of Origin, Bill of Lading</li> <li>2.Explain Modes of transportation, Air Cargo, Major Ports in India and Important Sea Routes of world, concept of Containerization, Inland Container Depots &amp; Container Freight Stations</li> <li>3.Compare and explain Types of Ships and Explain Shipping Formalities and Function and Roles of Shipping Intermediaries</li> <li>4.Understand Freight and Carriage of Goods by Road, Rail, Air and Sea.</li> </ol>
MBA-409	Rural Marketing	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Gain Conceptual knowledge about rural marketing with special reference to Indian context</li> <li>2.Understand the Rural Market Distribution</li> <li>3.Know about the Consumer Behaviour and Trends in Rural Marketing.</li> </ol>
MBA-410	Data Communication & Computer Network	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Have a good understanding of the OSI Reference Model and in particular have a good knowledge of Layers</li> <li>2.Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies</li> <li>3.Have a basic knowledge of the use of cryptography and network security;</li> <li>4.Specify and identify deficiencies in existing protocols, and then go onto formulate new and better</li> </ol>

		<p>protocols</p> <p>5. Have an understanding of the issues surrounding Mobile and Wireless Networks.</p> <p>6. Security Attacks and Security mechanism, virus and worms.</p>
MBA-411	PHP Programming	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Understand how server-side programming works on the web.</li> <li>2. PHP Basic syntax for variable types and calculations.</li> <li>3. Creating conditional structures.</li> <li>4. Storing data in arrays.</li> <li>5. Using PHP built-in functions and creating custom functions.</li> <li>6. Understanding POST and GET in form submission.</li> </ol>
MBA-412	Software Engineering	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Aware about the engineering approach to analysis, design and built the software</li> <li>2. Understand the phases and activities involved in the software life cycle models</li> <li>3. Analyse problems, and identify and define the computing requirements appropriate to its solution.</li> <li>4. Apply design and development principles in the construction of software systems of varying complexity</li> <li>5. Apply current techniques, skills, and tools necessary for computing practice.</li> <li>6. Apply various testing techniques to test a software</li> <li>7. Measure various characteristics of software.</li> <li>8. Compare and choose between maintenance and reengineering of software, when there is requirement to make changes in the software.</li> </ol>
MBA-413	RDBMS	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Understand database concepts and structures and query language.</li> <li>2. Understand the E R model and relational model</li> <li>3. Design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.</li> <li>4. Understand Functional Dependency and Functional Decomposition.</li> <li>5. Apply various Normalization techniques.</li> </ol>
MBA-414	Enterprise Resource	<p>After successful completion of this course , the</p>

	Planning	<p>students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Make basic use of Enterprise software, and its role in integrating business functions</li> <li>2. Analyze the strategic options for ERP identification and adoption.</li> <li>3. Design the ERP implementation strategies.</li> <li>4. Create reengineered business processes for successful ERP implementation.</li> <li>5. Basics of SCM and E-Business.</li> </ol>
MBA-415	Management of Financial Institutions	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Understand Financial Institutions in India and their role in economic development.</li> <li>2. Discuss models and concept of micro and non-banking finance companies.</li> <li>3. Elaborate growth of Insurance Industry in India.</li> </ol>
MBA-416	Banking & Insurance Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Understand basic concepts and functions of banking and KYC norms and operations.</li> <li>2. Understand Universal Banking, ADR and GDR.</li> <li>3. Explain Insurance Business Environment in India and regulations of IRDA.</li> </ol>
MBA-417	Management Control Systems	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Discuss basic Concepts And Domain Of Management Control.</li> <li>2. Explain responsibility centres and informal and formal control systems.</li> <li>3. Analyse Financial Performance Report and Management Control Of Multinational Companies.</li> </ol>
MBA-418	Management of Working Capital	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Define and understand the importance of working capital.</li> <li>2. Identify the optimum sources of financing working capital needs.</li> <li>3. Learn the techniques of managing cash flows.</li> <li>4. Learn to manage the components of the working capital efficiently in order to minimise the cost and maximise the profit of the business firm.</li> </ol>
MBA-419	Corporate Tax Planning	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the Income Tax Act, 1961 – Definitions and concepts (Section 1 to 4), Scope of Total income and Residential Status.</li> </ol>

		<p>2.Learn about Deductions to be made in Computing Total Income of Company, Deduction of Tax at Source.</p> <p>3.Know about various Tax Planning Decisions with regard to Capital Structure, Bonus Shares &amp; Dividend Policy, Make or Buy Decision, Own or Lease, Closure or Continue and Repair or Renewal, Online Filing of Return.</p>
MBA-420	International Financial Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Elaborate concepts and role of International Finance manager in a MNC.</li> <li>2.Understand Role of IMF, IBRD and Development banks.</li> <li>3.Explain Multinational Fund Flows and Country Risk Analysis.</li> <li>4.Express International Investment Management, Mergers and Acquisitions.</li> </ol>
MBA-421	Material Planning and Inventory Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Understand the Elements of Inventory Management, Types of inventory and Role of inventory in Operations.</li> <li>2.Elaborate Inventory costs, Carrying costs, Ordering costs, Shortage costs in Inventory Management.</li> <li>3.Elaborate the concept of Economic Order Quantity Models based on Reorder Point, Safety Stocks, Service Level and order size.</li> </ol>
MBA-422	Management of Logistics	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Understand Geo-Market dynamic Logistical operation and network.</li> <li>2.Explain different transportation modes and their pros and cons.</li> <li>3.Describe Material Handling including Warehousing and Packing.</li> </ol>
MBA-423	Plant Design & Layout	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1.Discuss types of building and importance of ideal building.</li> <li>2.Elaborate Plant Layout, Designing Process Layout and Line Balancing Concepts.</li> <li>3.Understand Material Handling System and classification of Material Handling Concepts.</li> </ol>
MBA-424	Total Quality Management	<p>After successful completion of this course , the students shall be able to:</p>

		<ol style="list-style-type: none"> <li>1. Understand methods and history of TQM.</li> <li>2. Express Reliability of Quality characteristics and Quality directors.</li> <li>3. Understand JIT, its cause and effects.</li> </ol>
MBA-425	Technology Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Understand various aspects and issues of Technological Change and Innovation.</li> <li>2. Elaborate Technology Acquisition and alternatives for acquiring new Technology.</li> <li>3. Discuss Technological Environment in India and role of various Government Organizations such as DST.</li> </ol>
MBA-426	Compensation Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Understand Compensation Management in Organization, factors affecting compensation system in Organization.</li> <li>2. Understand the types of Grade and Pay Structures for Organizational Performance.</li> <li>3. Elaborate Govt. and Legal issues in Compensation System, National Wage Policy.</li> </ol>
MBA-427	Social Security and Labour Welfare	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Comprehend the meaning of Labour Welfare.</li> <li>2. Learn about various legislations regarding wages and compensation to be paid to labour .</li> <li>3. Understand provisions relating to Provident Fund and Gratuity .</li> </ol>
MBA-428	Industrial Psychology	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the basic concepts of Psychology.</li> <li>2. Learn about the concept of Individual Differences.</li> <li>3. Elaborate Organisation Stress and managing Stress.</li> </ol>
MBA-429	Management Training and Development	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Learn Meaning and importance of Training</li> <li>2. Understand the role and challenges to Training Managers.</li> <li>3. Familiarize with new trends in training methods and their effectiveness..</li> </ol>
MBA-430	Cross Cultural Issues in Global Management	<p>After successful completion of this course , the students shall be able to:</p> <ol style="list-style-type: none"> <li>1. Understand the concept of International Cultural Environment, Comparison of Cross-cultural</li> <li>2. Elaborate Cross Cultural Communication and Negotiation</li> </ol>

		<p>3.Elaborate Ethics in International Business</p> <p>4.Understand the concept Diversity at Work, Managing diversity and Causes of diversity.</p>
MBA-431	International Economic Environment	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Understand International Economic Organisation</p> <p>2.Elaborate stages of Economic Integration and factors affecting Economic Integration.</p> <p>4.Have Understanding of various Regional Blocks.</p>
MBA-432	International Financial Management	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Know about the operations in Capital Budgeting and its use for MNCs</p> <p>2.Describe complexities of managing finance of multinational firm, currency and interest rate risk management</p> <p>3.Understand the regulatory framework within which the operations can take place</p> <p>4. Know about key elements and issues of International Taxation.</p>
MBA-433	Foreign Trade Policy and Documentation	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Know about the significance of Procedures and Documentation in International Trade, the Procedures and Documentation as Trade Barriers.</p> <p>2.Elaborate the official machinery for trade Procedures and Documentation, methods of payment in International Trade, realization of Export proceeds – provisions of RBI's, Export Promoting Institutions, Pre-shipment and Post Shipment</p> <p>3.Define the Export Order Processing &amp; Export Price Quotations, role of Forwarding Agents; Cargo Insurance and Claim Procedure.</p>
MBA-434	Global Human Resources Management	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Explain forms of International HRM and its functions.</p> <p>2.Describe Global Workforce Management and Organizational renewal.</p> <p>3.Understand Structural Evaluation of Global Organization and Cross Cultural Communication.</p>
MBA-435	Foreign Language for Business	<p>After successful completion of this course , the students shall be able to:</p> <p>1.Explain Definite &amp; Indefinite articles</p> <p>2.Describe Conjunction of verbs of the first and second groups</p>

		3. Understand Comparative adjectives, superlatives, possessive pronouns, personal pronoun.
MBA-436	Supply Chain Management	After successful completion of this course , the students shall be able to: 1. Understand Concept & Definitions of Supply Chain, Supply Chain Structure, distribution management in SCM 2. Explain Role of SC as a value driver : Integrative Management, Responsiveness, Financial Sophistication 3. Study impact of Globalization & Technological revolution in Supply Chain management.
MBA-437	Merchandising Management	After successful completion of this course , the students shall be able to: 1. Discuss needs and importance of Visual Merchandising. 2. Explain the Psychological effects of Colours and identify basic colour schemes. 3. Critical analysis of Ethical and Legal issues in Merchandise Purchasing and Pricing Strategies.
MBA-438	Sales and Distribution Management	After successful completion of this course , the students shall be able to: 1. Explain Objectives, Nature & Scope, Sales Environment, Sales Planning, Strategic role of sales management, Sales Planning and Sales Forecasting & Budgeting, Sales Quotas and Targets, 2. Define Marketing Channels and Functions and Significance, Structure -Vertical and Horizontal, Symbiotic, Role of marketing channels in the dynamic market place 3. Explain Reporting Formats for Primary and Secondary Sales, Monthly Sales Plan, Territory Sales and Coverage Plan, Daily Sales Call Report.
MBA-439	Consumer Behaviour in Retailing	After successful completion of this course , the students shall be able to: 1. Understand Consumer Behavior and Decision Making Process. 2. Explain types of groups and family influence on decision making. 3. Understand Gaps Model of Service Quality
MBA-440	Customer Relationship Management	After successful completion of this course , the students shall be able to: 1. Fundamentals concepts in Relationship Marketing. 2. Role of CRM in various sectors 3. Sales promotion and public relations and determining promotional budget.

MBA-441	Agribusiness Supply Chain Management	After successful completion of this course , the students shall be able to: 1.Evaluation of Supply chain management and its significance. 2.Understand Inventory management, EOQ,ABC Inventory Control System 3.Elaborate the use of IT in supply chain management.
MBA-442	Rural Marketing	After successful completion of this course , the students shall be able to: 1.Understand the basic Rural Market Environment. 2.Describe Rural Demand and Rural Market Index. 3.Explain the role of Corporative Institutions in Rural Marketing.
MBA-443	Rural Development and Agriculture Extension	After successful completion of this course , the students shall be able to: 1.Understand Rural Environment in India and comparison between rural and urban business environment. 2. Learn about various development programs such as Food for worker, IndraAwaasYojna and NREGA Yojna. 3.Understand Agencies for Rural and Agriculture development.
MBA-444	Farm Business Management	After successful completion of this course , the students shall be able to: 1.Elaborate the concept of Farm management in India. 2.Understand tools of Farm Management Analysis 3.Explain the Classification and Composition of Farm Labour, Labour Problem Under Indian Conditions.

**Program Name: - BACHELOR OF VOCATION (RETAIL  
MANAGEMENT)**

**Program Code :- BVRM**

**Program Educational Objectives (PEO)**

The program aims are

**PEO 1.** The students will have in-depth knowledge about various management concepts and functional areas of management in context of retail business.

**PEO 2.** To develop conceptual knowledge and skill set required as per national occupational standards (NOS) of retail sector.

**PEO 3.** To make the students understand the relevance of pursuing higher education such as M.Voc , MBA Retail etc. or start career in retail industry.

**PEO 4.** To develop entrepreneurial mindset their by enabling the students to consider setting up their own retail outlets.

**PEO 5.** To recognize and understand the ever changing global retail environment and develop aptitude and ability to adapt to this ever changing environment.

**Program Name: - BACHELOR OF VOCATION (RETAIL  
MANAGEMENT)**

**Program Code :- BVRM**

**Program Outcomes (PO)**

After completing Bachelor of Vocation program in Retail Management, a student will be able to

**PO 1.** Able to apply management fundamentals and principles in retail business world

**PO 2.** Able to recognise need for and develop zeal for higher studies

**PO 3.** Able to understand professional ethics and responsibility towards society

**PO 4.** To be a successful co worker and ultimately a successful team leader

**PO 5.** Enhancing entrepreneurial abilities so as to be capable of taking up independent business ventures

**Program Name: - BACHELOR OF VOCATION (RETAIL MANAGEMENT)**

**Program Code :- BVRM**

**Program Specific Outcomes (PSO)**

**PSO 1.** To develop understanding of retail business formats and retail channels.

**PSO 2.** To make the students aware of key drivers in retail business sector.

**PSO 3.** To develop and understanding of Marketing , Finance, HR and Other functional aspects of retail businesses.

**PSO 4.** To develop entrepreneurial, creativity, leadership and innovative mindset in the students.

**PSO 5.** To prepare the students for working successfully as a part of successful team or becoming a successful team leader .

**PSO 6.** To imbibe professional ethics in the students so that they create ethically strong retail organizations.

**PSO 7.** To create environmental awareness among the students so that they can lay foundation for environmentally sustainable retail business model.

**Course Outcome:**

<b>COURSE CODE</b>	<b>COURSE</b>	<b>COURSE OUTCOME</b>
BVRM- 103	Retail & Store Management	<b>After successful completion of this course,</b>

		<p><b>the student shall be able to:</b></p> <p>Understand the overview and aspects of retail stores and types of retail stores.  Learn the concept of merchandise management and process of store opening  Know about store layout, SCM, and responsibilities of store manager</p>
BVRM- 104	Retail Consumer Behaviour	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Create a positive image of product, services, and organization in the customers' mind.  Understand consumer buying process and motivational aspects.  Demonstrate products to customers according to their needs and motives.  Know the aspects of consumer perception, learning, and personality.</p>
BVRM-105	Customer Relationship Management	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand the concept of customer relationship management.  Resolve customer concerns and to improve customer relationship.  Understand how to meet with customers' expectations.  Understand the emerging perspectives in CRM.</p>
BVRM- 201	Business Communication	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Communicate effectively.  Present their thoughts eloquently.  Learn the role of body language as a non-verbal tool of communication.  Face interviews with confidence.  Learn the technicalities of presentation skills.</p>
BVRM- 202	Fundamentals of Accounting	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Learn the basics of accounting terminology and comprehensive knowledge of maintenance of accounts.  Apply the accounting concepts and conventions to maintain the business records.  Learn about the various subsidiary books used in retail business.</p>

		Understand the preparation of financial statements.
BVRM- 203	Store display & visual Merchandising	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Know about the Store merchandise handling and basics of Visual Merchandising.</p> <p>Understand the accessories, equipment, and hygiene of display area.</p> <p>Know about safe transfer of merchandise to display area.</p> <p>Learn about the assembling of products before display.</p>
BVRM- 204	Sales Management	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Gain knowledge about products and services, and retail competitions.</p> <p>Maintain the availability of goods, and manage waste material.</p> <p>Understand the concept of point of sale (POS) and various modes of payments.</p>
BVRM-205	Organization and Team Dynamics	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand the concepts of Company Vision, Mission, and Policies.</p> <p>Know the tactics of effective communication in an organization.</p> <p>Learn about how to work effectively in a Retail Team.</p>
BVRM- 301	Principles and Practice of Management	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand the fundamental concepts, nature and principles of management.</p> <p>Learn about the roles and responsibilities of managers and adapt towards the various styles of management across organizations.</p> <p>Apply various leadership styles while managing people.</p> <p>Understand the basics of communication and its barriers.</p>
BVRM- 302	Marketing Management	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand the basics of marketing, selling, marketing mix and its core concepts.</p> <p>Know about the different ways of promoting products and increasing sales and promotions.</p> <p>Understand the process of new product</p>

		<p>development.</p> <p>Get knowledge about the emerging pricing methods and new channels of marketing.</p> <p>Develop necessary skills for effective market segmentation, targeting and positioning.</p>
BVRM- 303	Retail store operations	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Develop skill to manage the products in retail store.</p> <p>Develop detail understanding of merchandising &amp; its importance</p> <p>Prepare to make retail plan.</p> <p>To enable to procure right merchandise</p> <p>Able to perform categorization in the retail store</p>
BVRM- 304	Economics for Retail Managers	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand basics of Customer Experience Management</p> <p>To understand the role of product demonstration in sales</p> <p>To understand the customer loyalty and service quality</p>
BVRM- 401	Personality Development & Negotiation Skills	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Acquaint with different aspects of personality and role of soft skills in personality development.</p> <p>Understand psychology and success, self-awareness, goals and obstacles, positive thinking, and self-motivation</p> <p>Learn the nature, role and tactics of negotiation and its process.</p>
BVRM- 402	Project management	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand suitable framework for gaining insight in the Process of Preparation, Appraisal, Monitoring and Control of a Project.</p> <p>Focuses on the role of Project Management Techniques and how to mobilize finance for domestic and international projects.</p> <p>Understand the underlying concepts, strategies and issued involved in the management of project's risk.</p>

BVRM- 403	Leadership Principles	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand the role of leadership for effective team communication.</p> <p>Monitor and manage store performance.</p> <p>Know the tactics of leadership and motivation in an organization.</p>
BVRM-404	Business Ethics	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Learn about business ethics and code of conduct for Business.</p> <p>Understand the role of Corporate Social Responsibility.</p> <p>Understand about various legal, economic and ethical dimensions of business.</p> <p>Apply the principles of corporate governance in business operations.</p>
BVRM- 501	Total Quality Management	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand the concept and dimensions of quality.</p> <p>Evaluate the principles of quality management and how these principles can be applied within quality management systems.</p> <p>Critically appraise the organisational, communication and teamwork requirements for effective quality management.</p>
BVRM- 502	Retail Consumer Behavior	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Create a positive image of product, services, and organization in the customers' mind</p> <p>Understand consumer buying process and motivational aspects</p> <p>Demonstrate products to customers according to their needs and motives</p> <p>Know the aspects of consumer perception, learning, and personality.</p>
BVRM- 503	Mall Management	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand the dynamics of mall management.</p> <p>Understand different types of malls and determinants of designing of the malls.</p> <p>Analyse the growth of malls in India and</p>

		<p>revenue model of shopping malls.</p> <p>Know about the strategic decisions regarding financing and leasing administration.</p>
BVRM-DSE(I)	Merchandise Planning and buying	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Explain how retailers forecast expected sales for merchandise categories.</p> <p>Summarize how retailers plan about the merchandise and maintain requisite inventory levels.</p> <p>Explore the techniques used to evaluate merchandising decisions.</p> <p>Learn about how retailers decide on merchandise allocations.</p>
BVRM-DSE(II)	Business Law	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Demonstrate an understanding of the Legal Environment of Business.</p> <p>Learn the application of basic legal knowledge to business transactions.</p> <p>Understand provisions of various laws used in retail industry while dealing with customers and vendors.</p>
BVRM-DSE(III)	Negotiation Skills	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Understand fundamentals of negotiation skills and to apply these concepts in the formulation of business policies.</p> <p>Learn the nature, role and tactics of negotiation and its process.</p> <p>Understand how culture affects negotiation.</p>
BVRM-DSE(IV)	Production and Operations Management	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Learn the Role &amp; Responsibilities of operations manager.</p> <p>Understand Product Planning and Design.</p> <p>Understand productivity techniques.</p> <p>Understand Inventory Management</p>
BVRM-DSE(V)	Advertising and Sales Management	<p><b>After successful completion of this course, the student shall be able to:</b></p> <p>Describe different types of advertisement and to Identify key players in advertising industry.</p>

		Discuss the ethics in advertisement and it helps the students in Identifying and taking decisions regarding the most feasible advertising appeal and media mix Understand pre-testing, post testing and concurrent testing of ads to determine their effectiveness.
BVRM-DSE(VI)	Inventory Management	<b>After successful completion of this course, the student shall be able to:</b> Understand Inventory Management & Control Policy. Learn Material requirement planning. Understand the modern Inventory Management Techniques and Manufacturing Systems.
BVRM-DSE(VII)	Retail Logistic Management	<b>After successful completion of this course, the student shall be able to:</b> Understand Logistics Management and Physical Distribution Learn Transportation and Freight Management. Learn Containerisation and Interstate tariffs and documentation.

### **Program Name: B.A. (Honours) English**

#### **Programme Educational Objectives**

#### **Programme Name: BA (Hons) English**

#### **Programme Code: BAHENG**

**PEO1.** To expose students to a wide range of writing from British, American, Indian and Anglophone traditions.

**PEO2.** To explore how writers use the creative resources of language- in fiction, poetry, non-fiction prose, and drama- and thereby inculcate a range of human experience.

**PEO3.** To enable them to read a variety of texts critically and proficiently, and also be competent enough to demonstrate, in writing or speech, comprehension, analysis, and interpretation of those texts.

**PEO4.** To give wings to their imagination, and also mold it by giving it the necessary literary, technical, aesthetic sense.

**PEO5.** To give them a deeper insight into life, thereby help in enriching their personalities.

**PEO6.** To make them more effective thinkers and communicators who are well equipped for a variety of careers in the society.

### **Programme Specific Objectives**

**Programme Name: BA (Hons) English**

**Programme Code: BAHENG**

**PSO 1.** To introduce students to the major genres, styles and forms of Literature and also to literatures belonging to the various ages, so as to give them a panoramic view of the English literary tradition.

**PSO 2.** To deliver knowledge and understanding of English Language and Literature in totality, and strengthen their conceptual knowledge of the subjects.

**PSO 3.** To introduce the students to the social, cultural, political and intellectual backgrounds of the various periods in literary history.

**PSO 4.** To encourage the students towards self-expression.

**PSO 5.** To provide a holistic grooming of communication skills in English encompassing speaking skills, writing skills, listening skills and reading skills.

**Programme Name: BA (Hons) English**

**Programme Code: BAHENG**

**Programme Outcomes:**

**PO 1.** To make them competent litterateurs, by providing a thorough knowledge of the literary canon, through a study of a range of texts from different ages, different cultures, different genres, and different ideologies.

**PO 2.** To develop a literary taste and a critical acumen, and give birth to a critical insight in them to assess and appreciate a work for its merit and appeal.

**PO 3.** To develop in them through literature all basic human values and give them an empathetic, inclusive attitude, so as to contribute towards an overall societal reform gradually.

**PO 4.** To acquaint them with the possible avenues, by opening the doors to a repertoire of options before them, for future- theatre, media (print & visual), academic research, critical reviewing & writing, IELTS training, further study in literature, etc.

**PO 5.** To make them confident in articulating their feelings. To hone their literary skills and shape and mold it to give them strong footing in the conceptual knowledge of the subject.

**PO 6.** To prune their personality and make them adept, expert communicators, who can lead group discussions, face interviews, participate in extempore, and vent out their views.

**Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
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BAHENG 101	Indian Classical Literature	<ol style="list-style-type: none"> <li>1. This course will provide knowledge to the students about the important concepts, themes and traditions through the study of influential classical texts from the ancient world.</li> <li>2. It will create awareness among the students of the rich and diverse literary cultures of ancient India.</li> <li>3. The students will acquaint themselves with some of the greatest masterpieces of the Indian classical literature.</li> <li>4. It will enhance the ability of the students to read the texts critically and proficiently.</li> <li>5. It will enable the students to distinguish between the essential features of Literature – that remain central to literary creation across time and space.</li> </ol>
BAHENG 102	European Classical Literature	<ol style="list-style-type: none"> <li>1. This course will enable the students to become aware of the literary cultures of Augustan Rome and Athens.</li> <li>2. It will introduce the students to the various literary terms and its implementation and significance in European writing.</li> <li>3. It will acquaint the students with the origin of the European Canon.</li> <li>4. It will enhance their ability to interpret the translated works and provide them with an understanding of the significance of how translation bridges cultures across the world.</li> <li>5. The students will be able to discover the best of the ethical, ideological and cultural elements from the wide gamut of classical texts from across cultures.</li> <li>6. It will introduce the students to some of the best poetry and drama of European classical literature.</li> </ol>
BAHENG 104	Academic Writing and Composition	<ol style="list-style-type: none"> <li>1. The students will be able to plan and structure their writing effectively.</li> </ol>

		<p>2. It will enable the students to employ various learning strategies to build grammatical accuracy and vocabulary range.</p> <p>3. The students will be able to demonstrate an understanding of the connection between writing and thinking and use writing and reading for inquiry, learning, thinking and communicating in an academic setting.</p> <p>4. It will enable the students to communicate their ideas effectively and coherently.</p> <p>5. The students will be able to demonstrate skills in using the conventions of academic writing, including appropriate use of referencing and citations.</p>
BAHENG 201	Indian Writing in English	<p>1. The students will be able to evaluate the literary, cultural, historical and political impact of the works of Indian writers in English and thereby understand their role in bringing about social awareness and transformation.</p> <p>2. The students will be able to comprehend the evolution of Indian Writing in English from the colonial phase till the present.</p> <p>3. It will provide students a deeper understanding of the major traditions and values of India.</p> <p>4. It will enable the students to analyze and appreciate the idea of ‘Indianness’ and ‘Indian sensibility’ inscribed in the works of Indian writers in English.</p> <p>5. It will enable the students to critically appreciate various Indian English short stories, poems and novels.</p>
BAHENG 202	British Poetry and Drama: 14 <sup>th</sup> to 17 <sup>th</sup> Century	<p>1. This course will acquaint students with major religious, political and social movements from fourteenth to seventeenth centuries and their influence on British</p>

		<p>Literature.</p> <p>2. It will introduce the students to British poetry and drama from the age of Chaucer to the Jacobean age.</p> <p>3. It will enable the students to critically appreciate various literary works of the prescribed period.</p> <p>4. It will acquaint students with the origin and growth of drama in England.</p> <p>5. The students will be able to analyze and appreciate the representative works of Elizabethan and Jacobean drama with respect to its plot, character, dialogue, theme, characters, etc.</p>
BAHENG 204	Media and Communication Skills	<p>1. The students will be able to comprehend the significant role of media as a platform which can create awareness about the social issues.</p> <p>2. The students will become knowledgeable about the language and intricacies of the art of advertising through practical training.</p> <p>3. It will raise their level of confidence in critical analysis and research in creative works of writing.</p> <p>4. It will acquaint students with the process and practice of writing for the media.</p> <p>5. The students will be able to opt for careers in journalism and media, cultural and creative industries, publishing industries like digital design, digital journalism and the field of advertising and marketing.</p>
BAHENG 301	American Literature	<p>1. The students will be acquainted with the various historical, cultural, political and intellectual developments that shaped the Literature of America.</p> <p>2. It will enable the students to appreciate the different forms and styles of American poetry.</p> <p>3. It will acquaint students with social realism</p>

		<p>and folklore in American Literature.</p> <p>4. To understand the historical background of American Literature and the American dream.</p> <p>5. To familiarize the students with cultural, ethnic, racial and gender disparity in America and its effect on American Literature.</p> <p>6. To acquaint the students with the evolution and development of American Literature from the colonial period to present times.</p>
BAHENG 302	Popular Literature	<p>1. The students will be introduced to various genres such as romance, detective fiction, fantasy which can help them to gain a better understanding of the popular roots of literature.</p> <p>2. It will educate the students about how gender functions in the social context and how it affects Literature.</p> <p>3. It will educate students about ethics and education in children's literature.</p> <p>4. The students will be acquainted with the distinct characteristics of Popular Literature.</p> <p>5. It will enable the students to understand the various concerns and prejudices of the contemporary times as represented in the popular Literature.</p>
BAHENG 303	British Poetry and Drama: 17 <sup>th</sup> and 18 <sup>th</sup> Century	<p>1. It will acquaint students with the seventeenth and eighteenth century British poetry and drama.</p> <p>2. The students will be able to critically analyze the literary texts from the prescribed literary period.</p> <p>3. They will be able to understand different features of Neoclassicism and its influence on English society.</p> <p>4. It will make students adept in their knowledge and use of poetic devices and common techniques involved in poetry.</p> <p>5. It will enable the students to understand</p>

		how society and culture played a significant role in the lives and careers of the writers of the age.
BAHENG 304	Text and Performance	<ol style="list-style-type: none"> <li>1. The students will be able to appreciate the difference between drama and other genres of Literature.</li> <li>2. The students will be able to demonstrate an understanding of the social and artistic movements that have shaped theatre as we know it today.</li> <li>3. The students will be able to develop practical skills related to the theory and practice of theatre arts.</li> <li>4. It will allow the students to integrate and synthesize skills, knowledge and processes into realizing a performance.</li> <li>5. It will equip the students with an understanding of Alienation Effect, the theory of Rasa, etc.</li> </ol>
BAHENG 305	English Language Teaching	<ol style="list-style-type: none"> <li>1. The students will be able to gain in-depth knowledge of the structure and different methods of teaching English.</li> <li>2. It will enable them to evaluate and use English language teaching materials.</li> <li>3. The students will get acquainted with the psychology of learning and applying it to the classroom situations.</li> <li>4. The students will be able to develop all the four language skills - listening, speaking, reading and writing.</li> <li>5. It will enable them to comprehend new and newer methodologies, techniques and strategies of teaching.</li> </ol>
BAHENG 401	British Literature: 18 <sup>th</sup> Century	<ol style="list-style-type: none"> <li>1. This course will acquaint students with three remarkable forms of literature: novel, poetry and drama.</li> <li>2. The students will be able to explore the</li> </ol>

		<p>literary, cultural and socio-political factors that are called forth in the making of the novel.</p> <p>3. It will introduce the students to the poetry of the eighteenth century within the context of the literary, cultural, religious and political developments of the age.</p> <p>4. It will educate the students on didactic human values as virtually mirrored in Thomas Gray's poem.</p> <p>5. A detailed analysis of the prescribed texts will help students to formulate their critical thinking about the diverse genres of literary output in that era.</p>
BAHENG 402	British Romantic Literature	<p>1. The students will be able to evaluate and compare various thematic perspectives and styles within English Romanticism.</p> <p>2. It will enable them to analyze key themes, topics, and debates that emerge in Romantic texts.</p> <p>3. The students will be able to examine works of major English Romantic poets by situating them in their historical context of rapid social change and violent political upheavals.</p> <p>4. The students will be able to understand the difference between reason and imagination and its use in Romantic Literature.</p> <p>5. The students will be able to analyze the major authors and texts of English Romanticism through close reading.</p> <p>6. It will enable the students to appreciate the nuances of poetic language and poetic devices.</p>
BAHENG 403	British Literature: 19 <sup>th</sup> Century	<p>1. It will acquaint the students with an understanding of the existing conflict between faith and doubt in Victorian society.</p> <p>2. It will enable the students to study English fiction and poetry written during the</p>

		<p>nineteenth century, and to reflect on their meanings and reception at the time of writing, and their meanings and reception today.</p> <p>3. It will acquaint the students with various literary devices used by the writers of the Victorian and late Victorian period.</p> <p>4. It will enable students to understand the concept of marriage and sexuality, the concept of utilitarianism and its role in human life.</p> <p>5. The students will be able to demonstrate a critical understanding of the selected texts.</p>
BAHENG 404	Language and Linguistics	<p>1. This course will equip the students with some tools, techniques, and skills for linguistic analysis.</p> <p>2. The students will be acquainted with the basic concepts necessary to pursue linguistics studies further.</p> <p>3. It will enable them to understand the relationship between written and spoken language.</p> <p>4. The students will be able to perform a phonemic and morphological analysis to determine the phonemes, allophones, morphemes and allomorphs of the given language.</p> <p>5. The students will be able to identify the basic constituent structure of the given language.</p>
BAHENG 405	Soft Skills	<p>1. The students will be able to understand the significance and essence of a wide range of soft skills.</p> <p>2. They will learn how to apply soft skills in social and professional settings.</p> <p>3. It will enable them to employ these skills to improve interpersonal relationships.</p> <p>4. Through Teamwork, they will learn how to connect and work with others to achieve a set task.</p>

		<p>5. The students will learn how to employ soft skills in order to ensure workplace and career success.</p>
BAHENG 501	Women's Writing	<p>1. The students will learn to recognize the meaning and significance of feminine voices and concerns in a text.</p> <p>2. This course will enable the students to know the diversity of women's experiences and their varied cultural moorings.</p> <p>3. They will be able to understand different forms of literature including poetry and short stories written by women.</p> <p>4. The students will learn about the impact of culture, ethnicity, class, sexuality and religion on women's experience and their responses.</p> <p>5. It will enable them to understand women's literary history, women's studies and feminist criticism.</p> <p>6. To enable the students to form critical opinions and express views on recurrent themes and issues in literature written by women, and understand the impact of gender on literature.</p>
BAHENG 502	British Literature: The Early 20 <sup>th</sup> Century	<p>1. It will introduce the students to major British writers of modern times whose poetry has an inerascable mark throughout the latter decades.</p> <p>2. The students will be able to analyze the reasons for the rapidly growing prominence of the novel.</p> <p>3. It will acquaint students with the historical background including the socio-political changes in the early twentieth century.</p> <p>4. It will enable the students to comprehend and critically analyze the selected texts of this literary era.</p> <p>5. It will enable the students to develop and practice their interpretive skills and textual</p>

		analysis in reading literature.
BAHENG 503	Literature of the Indian Diaspora	<ol style="list-style-type: none"> <li>1. This course will acquaint the students with the experiences of dislocation, relocation, acculturation and marginalization as explored and addressed in the works of these writers.</li> <li>2. It will acquaint students with the changing historical, political, socioeconomic, and cultural contexts of migration from the Indian subcontinent.</li> <li>3. The students will be able to analyze and appreciate the idea of ‘Indianness’ and ‘Indian sensibility’ inscribed in the works of various writers of the Indian Diaspora.</li> <li>4. The students will develop a fuller understanding of the extensive and multidisciplinary literature on the diasporic studies.</li> <li>5. It will enable the students to apply this theoretical literature to various dispersed populations (refugees, migrants, etc.) while using it as a critical and analytic lens to shed light on identity, political mobilization, etc.</li> </ol>
BAHENG 504	Literary Criticism	<ol style="list-style-type: none"> <li>1. The students will be able to comprehend and effectively apply knowledge of practical criticism to appreciate and evaluate literary work with reference to its structure, texture and tone.</li> <li>2. It will enable the students to examine historical contexts for the development of contemporary theory and criticism.</li> <li>3. The students will be able to span the history of western literary criticism.</li> <li>4. It will strengthen and deepen critical reading, writing, and interpretive practices of the students.</li> <li>5. It will enable the students to develop the skill of attempting a close reading of the text.</li> </ol>

BAHENG 601	Modern European Drama	<ol style="list-style-type: none"> <li>1. The students will become acquainted with the rich diversity of themes, techniques, and forms used in drama across Europe.</li> <li>2. The students will be able to develop knowledge of literary terms and key concepts involved in reading and analyzing drama.</li> <li>3. The students will understand the historical and cultural background of each drama in order to become sensitive towards the critical relation between society and theatre.</li> <li>4. It will enable the student to understand the origin of Absurd drama and major themes of Absurd drama.</li> <li>5. The students will be able to demonstrate a critical understanding of the selected texts.</li> </ol>
BAHENG 602	Post Colonial Literature	<ol style="list-style-type: none"> <li>1. The students will be acquainted with the key concepts of postcolonial literary theory through the study of postcolonial texts.</li> <li>2. It will enable the students to understand and evaluate the key debates in postcolonial studies.</li> <li>3. It will facilitate them to gain knowledge about the terms and concepts exclusive of post colonial literature.</li> <li>4. The students will be introduced to aspects of subjectivity, race, class and feminism as they inhere in the postcolonial space.</li> <li>5. It will enable the students to make a critical analysis of a work of art within the frames of postcolonial studies.</li> </ol>
BAHENG 603	Partition Literature	<ol style="list-style-type: none"> <li>1. The students will become familiar with the development and practice of the Partition Literature.</li> <li>2. The students will develop a strong understanding of the complex politics that led to the partition of the Indian subcontinent.</li> <li>3. It will enable the students to demonstrate an understanding of the ways that race, ethnicity,</li> </ol>

		<p>gender and religion developed in a related way during the colonial era.</p> <p>4. The students will develop an awareness of the regional, social and political upheavals caused due to geopolitical power struggles.</p> <p>5. The students will be able to demonstrate an ability to express and evaluate their responses to the selected works.</p>
BAHENG 604	Autobiography	<p>1. The students will be able to compare and contrast the ways in which a perceiving, living individual (the "subject") is treated in biography, autobiography, and other literary genres such as poetry, fiction etc.</p> <p>2. It will enable the students to recognize how an author's own ideology shapes reality in an autobiography, including how it raises questions about truth, factuality, objectivity, and subjectivity.</p> <p>3. The students will be able to connect the autobiographical texts to their historical and cultural contexts.</p> <p>4. It will enable the students to explore the ways in which the writers construct and represent memory.</p> <p>5. The students will be able to understand the impact that these narratives have on our understanding of the political and cultural context in which these are produced.</p>

## **M.A English Programme Details**

### **Programme Educational Objectives**

**Programme Name: MA ENGLISH**

**Programme Code: MAENG**

#### **Programme Objectives:**

- PEO 1.** To cater to the interest of students to study various literatures in English with a focus on the socio-historical and political contexts.
- PEO 2.** To acquaint the students with various genres of literature.
- PEO 3.** To comprehend literature in the light of critical approaches.
- PEO 4.** To develop an understanding of various Literary ages and trends thereof.

### **Programme Outcomes**

**Programme Name: MA ENGLISH**

**Programme Code: MAENG**

#### **Programme Outcomes**

The Master of Arts English Programme:

- PO 1.** Helps the students learn the evolution of language and the politics
- PO2.** Enhances critical thinking of students
- PO 3.** Cultivates language skills of students by introducing them to structures of language through a wide variety of literary works.
- PO 4.** Hones the writing skills of students and they learn the conventions of academic writing
- PO 5.** Instills a critical perspective with which students approach the disciplines
- PO 6.** Introduces different literary periods and trends of each of these periods.

**PO 7.** Introduces works written by different sections of people (gender, racial and ethnic minorities) and makes the students give critical responses from different perspectives.

### **Programme Specific Outcomes**

**Programme Name: MA ENGLISH**

**Programme Code: MAENG**

#### **Programme Specific Outcomes:**

**PSO 1.** The course of Masters in English offers students the opportunity to study influential writings from the Indian, British, American, and global Anglophone traditions. Apart from developing the literary skills, this course helps students to build skills of analytical and interpretive argument. It enables the students to become careful and critical readers. The students become effective thinkers and communicators who will be well-equipped for a variety of careers in our information-intensive society.

**PSO 2.** To display an in depth knowledge of the genres of fiction, poetry and drama by writers of various cultures and historical eras.

**PSO 3.** To display the knowledge of historical and cultural contexts of literature.

**PSO 4.** To develop the ability to read works of literary, rhetorical and cultural criticism and deploy ideas from these texts in their own reading and writing.

Course Code	Course	Course Outcome
MAENG 1001	The Elizabethan and Jacobean Periods in English Literature 1560-1640	1. To acquaint the students with the social and political background of Elizabethan and Jacobean periods. 2. To familiarize the students with the major literary texts of the period. 3. To train the students in the reading of the literary texts in relation to the socio-political context.

MAENG 1002	The Restoration Period in English Literature 1640-1700	<ol style="list-style-type: none"> <li>1 .To familiarize students with the socio-political background of the Restoration Period in English Literature.</li> <li>2. To acquaint students with the major literary trends of this periods.</li> <li>3. To help students relate literary texts with the socio-political contexts of the Restoration period.</li> </ol>
MAENG 1003	The Augustan Period in English Literature 1700-1798	<ol style="list-style-type: none"> <li>1. To make students aware of the political and social background of the Augustan period in English Literature.</li> <li>2. To acquaint students with the major literary trends in this period.</li> <li>3. To help students read literary texts in the context of socio-political history.</li> </ol>
MAENG 1004(A)	(a)Women’s Writing in English	<ol style="list-style-type: none"> <li>1. To acquaint the students with the basic concepts of feminism.</li> <li>2. To make the students aware of the tradition of women’s writing.</li> <li>3. To help students read women’s writing in the context of modern literature.</li> </ol>
MAENG 1004(B)	(b)An Introductory Course In Linguistics	<ol style="list-style-type: none"> <li>1. To enable students to understand the scope of the discipline of Linguistics.</li> <li>2. To make students aware of the basic concepts in the study of languages.</li> <li>3. To initiate students into the study of the various concepts of Linguistics.</li> </ol>
MAENG 1005	Literature and Psychology	<ol style="list-style-type: none"> <li>1. To help students relate Literature to other disciplines.</li> <li>2. To train students read literary texts in the light of psychological theories.</li> <li>3. To familiarize students with the discourse of psychology and the</li> </ol>

		relevance of psychological concepts to the study of literature.
MAENG 1006	Seminar	<ol style="list-style-type: none"> <li>1. To enhance the presentation skills of the students.</li> <li>2. To make the students do extensive research on literary topics.</li> <li>3. To improve the research aptitude of the students.</li> </ol>
MAENG 2001	The Romantic Period(1798-1840)	<ol style="list-style-type: none"> <li>1. To acquaint students with the socio-political background of Romanticism in English Literature.</li> <li>2. To acquaint the students with the major works of the Romantic Period.</li> <li>3. To help students the philosophical ideas generated during this period and read literary texts in relation to them.</li> </ol>
MAENG 2002	The Victorian Period (1840-1900)	<ol style="list-style-type: none"> <li>1. To acquaint students with the intellectual and socio-political background of the Victorian period.</li> <li>2. To introduce the major literary works of the Victorian period.</li> </ol> <p>To train students in relating literary texts to their social contexts.</p>
MAENG 2003	The Modern Period (1840-1900)	<ol style="list-style-type: none"> <li>1. To acquaint students with the political and social events that shaped Modern Literature.</li> <li>2. To contextualize the modernist works in literature in relation to the intellectual currents of the period.</li> <li>3.To encourage students to read the texts closely in relation to the larger trends of the Modern period.</li> </ol>
MAENG 2004(A)	(a)Indian Literature in English Translation	<ol style="list-style-type: none"> <li>1To familiarize students with Indian Literary Traditions.</li> <li>2. To help understand the problems of literary translation.</li> <li>3.To enable students relate Indian texts produced in Indian Languages to the larger socio-political</li> </ol>

		contexts of modern literature.
MAENG 2004(B)	(b)New Literatures in English	<ol style="list-style-type: none"> <li>1. To acquaint the students with the various literary traditions of non-British English-speaking countries.</li> <li>2. To introduce the major literary works of countries like Canada, Nigeria, South Africa and Australia in relation to their historical context to students.</li> <li>3. To help students read the literary texts of New Literatures in a comparative context.</li> </ol>
MAENG 2005	Literature and History	<ol style="list-style-type: none"> <li>1. To help students relate Literature to History.</li> <li>2. To train students read literary texts in the light of historical backgrounds.</li> <li>3. To make students understand how Literature and History are connected.</li> <li>4. To familiarize students with the discourse of History and relevance of its concepts to the study of Literature.</li> </ol>
MAENG 2006	Seminar	<ol style="list-style-type: none"> <li>1. To enhance the presentation skills of the students.</li> <li>2. To make the students do extensive research on literary topics.</li> <li>3. To improve the research aptitude of the students.</li> </ol>
MAENG 3001	English Prose	<ol style="list-style-type: none"> <li>1. To acquaint the students with the defining features of essay.</li> <li>2. To familiarize the students with the development of the essay through different ages of English Literature.</li> <li>3. To make the students learn comparative analysis of essays from different ages written by different essayists.</li> </ol>

MAENG 3002	Literary Criticism	<ol style="list-style-type: none"> <li>1.To acquaint the students with the principles of criticism.</li> <li>2.To familiarize the students with the Classical, Neoclassical, Victorian, Modernist, the New Critical and Marxist orientations with the reading of the critical essays representative of the critical trends.</li> </ol>
MAENG 3003	Indian Writing In English	<ol style="list-style-type: none"> <li>To acquaint the students with Indian Literature written in English.</li> <li>2. To familiarize the students with Indian Writing in English in terms of poetry, drama and fiction in historical context.</li> <li>3.To train the students in the reading of the texts of Indian writing in English with reference to themes and forms in Indian Context.</li> </ol>
MAENG 3004 (A)	(a)American Literature –Novel and Poetry	<ol style="list-style-type: none"> <li>1. To acquaint the students with the history and development of American Literature.</li> <li>2. To familiarize the students with the important texts of American Literature.</li> <li>3. To train the students in the reading of American Literary texts in the terms of themes, forms and social-historical contexts.</li> </ol>
MAENG 3004 (B)	(b)English Language Teaching	<ol style="list-style-type: none"> <li>1. To acquaint the students with the concepts of English Language Teaching.</li> <li>2. To familiarize the students with English Language Teaching in Indian context and in terms of its methodology, items and skills.</li> <li>3. To initiate the students into the study of various concepts and applications of English Language Teaching.</li> <li>4. To familiarize the students with</li> </ol>

		English Language Teaching in terms of syllabus, design, material production, ESP (English for Specific Purpose) and teaching aids.
MAENG 3005	Philosophy and Literature	<ol style="list-style-type: none"> <li>1. To help the students to relate the Literature to Philosophy.</li> <li>2. To train students to read literary texts in the light of Philosophy.</li> <li>3. To familiarize the students with various philosophers and application of their philosophy with the study of Literature.</li> </ol>
MAENG 3006	Seminar	<ol style="list-style-type: none"> <li>1. To enhance the presentation skills of the students.</li> <li>2. To make the students do extensive research on literary topics.</li> <li>3. To improve the research aptitude of the students.</li> </ol>
MAENG 4001	World Fiction in English	<ol style="list-style-type: none"> <li>1. To acquaint the students with the World Fiction.</li> <li>2. To make the students explore the real life complexities of relationships, society or culture in a fictional narrative.</li> <li>3. To train the students in the close reading of the world famous novels written in English.</li> </ol>
MAENG 4002	Literary Theory	<ol style="list-style-type: none"> <li>1. To acquaint the students with the principles and history of literary theories.</li> <li>2. To familiarize the students with the recent critical trends like structuralism, feminism, postmodernism, post colonialism and ecocriticism.</li> <li>3. To initiate the students into a critical discourse of variety and contestation through various original critical essays.</li> </ol>

MAENG 4003	World Literature in Translation	<ol style="list-style-type: none"> <li>1. To acquaint the students with the classics in the World Literature.</li> <li>2. To familiarize the students with the world classics in various literary forms.</li> <li>3. To cultivate the sense of comparison and analysis in students.</li> </ol>
MAENG 4004(A)	(a)American Literature – Drama and Non –Fictional Prose	<ol style="list-style-type: none"> <li>1. To acquaint the students with the history and development of American Literature.</li> <li>2. To familiarize the students with American literary texts.</li> <li>3. To train the students in the reading of American literary texts in the terms of themes, forms and socio-historical context.</li> </ol>
MAENG 4004 (B)	(b)English Language Teaching	<ol style="list-style-type: none"> <li>1. To acquaint the students with the concepts of English Language Teaching.</li> <li>2. To familiarize the students with the techniques and approaches of teaching English.</li> <li>3. To encourage the students to study pragmatic aspects of English Language Teaching.</li> </ol>
MAENG 4005	Literature and History	<ol style="list-style-type: none"> <li>1. To help the students relate literature to other disciplines.</li> <li>2. To train the students in the reading of literature in terms of history.</li> <li>3. To familiarize the students with the discourse of history.</li> </ol>
MAENG 4006	Seminar	<ol style="list-style-type: none"> <li>1. To enhance the presentation skills of the students.</li> <li>2. To make the students do extensive research on literary topics.</li> <li>3. To improve the research aptitude of the students.</li> </ol>

**Programme Specific Outcomes and Course Outcomes**  
**Program Name: Bachelor of Science Hons. Physics (B. Sc. Hons. Physics)**  
**SESSION 2019-20**

Program Educational Objectives (PEO)

**Program Name: - BACHELOR OF SCIENCE Hons. PHYSICS (B.Sc.  
Hons. Physics)**

Program Code:- BSHPHY

The program aims are

**PEO 1.** Inculcating in-depth knowledge about various basic scientific concepts and functional areas of science in context of industry and research world.

**PEO 2.** Developing necessary experimentation, interpersonal, Team work and leadership skills so as to be able to take up various responsibilities in the science field.

**PEO 3.** Creating awareness about various social and ethical issues which will enable students to become ethical and responsible towards their Organization, Society and Nation.

**PEO 4.** Making the students recognize and understand the upcoming new technologies and inventions and develop aptitude and ability to adapt to this ever changing technical environment.

**PEO 5.** Developing skills among students so that scientific thinking and observation capability can be developed.

## Program Outcomes (PO) For Under Graduate Program

Program Name: - BACHELOR OF SCIENCE Hons. PHYSICS (B.Sc. Hons. Physics)

Program Code:- BSHPHY

After completing Bachelor program in Physical Sciences, a student will be able to

**PO 1.** Apply scientific fundamental concepts and principles in real life world.

**PO 2.** Develop an in-depth knowledge and understanding through the core courses which form the basis of Physics.

**PO 3.** Gain theoretical insight into scientific concepts theories and models

**PO 4.** Develop a foundation for pursuing higher education in the field of Science.

**PO 5.** Enhance their Creative thinking and problem-solving capabilities

**PO 6.** Use experimental apparatus as a tool for scientific investigations/understanding

**PO 7.** Have a broader knowledge base in Physics through more specialized and interdisciplinary content.

**PO 8.** Develop an appreciation for the fundamental concepts and working of devices used in everyday life employing scientific methods/tools of physics

## Program Specific Objectives (PSO)

Program Name: - BACHELOR OF SCIENCE Hons. PHYSICS (B.Sc. Hons. Physics)

Program Code:- BSHPHY

**PSO 1.** Understanding the basic concepts of physics particularly concepts in mechanics, quantum mechanics, statistical mechanics and electricity and magnetism to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws through logical and mathematical reasoning.

**PSO 2.** Learn to carry out experiments in basic as well as certain advanced areas of physics such as nuclear physics, condensed matter physics, and electronics.

**PSO 3.** To equip the students with theoretical knowledge along with the necessary practical skills for scientific world.

**PSO 4.** To develop conceptual and analytical abilities required for effective decision making

never changing technical environment.

**PSO 5.** The program intends to train the students to become competent enough for entry level science professionals the world.

**PSO 6.** Gain hands-on experience to work in applied fields.

**PSO 7.** Understand the basic concepts of certain sub fields such as nuclear, wave optics, solid state physics, and Special theory of relativity etc.

**PSO 8.** Gain a through grounding in the subject to be able to teach it at school levels.

**PSO 9.** Viewing physics as a training ground for the mind developing and critical attitude.

**PSO 10.** To develop research centered approach that can be applied to diverse fields.

**Course Outcomes:**

**B.Sc. (Hons.) PHYSICS-I**  
**SEMESTER I**

<b>S. No.</b>	<b>Course code</b>	<b>Course</b>	<b>Course outcome</b>
<b>1</b>	<b>BPH 102</b>	<b>MATHEMATICAL PHYSICS-I</b>	On completion of this course, students will be able to <ul style="list-style-type: none"><li>• Understand the basic fundamentals of Calculus Recapitulation.</li><li>• Describe and use the Differentiation.</li><li>• Explain the Calculus of functions of more than one variable.</li><li>• Discuss the applications Vector Calculus.</li><li>• Explain the use of Vector Differentiation and interaction.</li><li>• Understand proof of Fundamental Theorem of Calculus and the concept of the integrals of functions and vector field</li><li>• Understand the concept of Dirac Delta function and its properties.</li></ul>
<b>2</b>	<b>BPH 102P</b>	<b>MATHEMATICAL PHYSICS-I LAB</b>	On completion of this Laboratory course, students will be able to <ul style="list-style-type: none"><li>• Understand the basic fundamentals of Calculus Recapitulation.</li><li>• FORTRAN Programming</li></ul>

3	BPH 103	MECHANICS	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Describe relative motion, inertial and non-inertial frames.</li> <li>• Have a basic knowledge of concepts of vectors.</li> <li>• Understand the Conservation Laws and Properties of Space and Time.</li> <li>• Understand the analogy between translational and rotational kinematics.</li> <li>• Understand universal law of gravitation, gravitational potential energy and explain central forces.</li> <li>• Know the significance of Inverse Square Law Force.</li> <li>• Know the concept of Frames of Reference.</li> <li>• Know the principles of rotational motion and Special Theory of Relativity as well as Oscillations.</li> </ul>
4	BPH 103 P	MECHANICS Lab	<p>On completion of this Lab course, students with the help of experiments, will be able to</p> <ul style="list-style-type: none"> <li>• Describe relative motion, inertial and non-inertial frames.</li> <li>• Understand the Conservation Laws.</li> <li>• Understand the analogy between translational and rotational kinematics.</li> <li>• Understand universal law of gravitation, gravitational potential energy and explain central forces.</li> <li>• Know the significance of Inverse Square Law Force.</li> <li>• Know the concept of Frames of Reference.</li> <li>• Know the principles of rotational motion</li> </ul>
5	BPH104	PHYSICS 1 Generic Elective Papers(GE)	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concepts of the interference, diffraction and polarization of light and their applications.</li> <li>• Find the conditions of interference fringes.</li> <li>• Know about interference in thin films, Newton rings, Huygens-Fresnel theory,</li> </ul>

			<p>total internal reflection.</p> <ul style="list-style-type: none"> <li>• Distinguish between Fresnel and Fraunhofer diffraction.</li> <li>• Understand simple harmonic motion equation and its energy.</li> <li>• Describe differential equation of damped SHM.</li> </ul>
6	BPH104P	PHYSICS 1LAB	<p>On completion of this lab course, student will be able to</p> <ul style="list-style-type: none"> <li>• Determine the unknown capacitance by flashing and quenching of neon lamp.</li> <li>• To determine the refractive index of double refracting prism.</li> <li>• Determine the principal points of a lens system.</li> <li>• Understand the concepts of the interference, diffraction and polarization of light and their applications.</li> </ul>

**B.Sc. (Hons.) PHYSICS-I**  
**SEMESTER-II**

S. No.	Course code	Course	Course outcome
1	BPH 202	<b>ELECTRICITY AND MAGNETISM</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand electric and magnetic fields in matter.</li> <li>• Apply Maxwell's equations to various physical problems.</li> <li>• Calculate EM wave propagation.</li> <li>• Understand the use of Coulomb's Law and Gauss's Law for electrostatic force.</li> <li>• Use of Lorentz force Law for magnetic force.</li> <li>• Use of Faraday's Law in induction problems.</li> </ul>

			<ul style="list-style-type: none"> <li>• Understand the basic laws that underlie the properties of electric circuit elements.</li> </ul>
2	<b>BPH202P</b>	<b>ELECTRICITY AND MAGNETISM LAB</b>	<p>On completion of this Lab course, students with the help of experiments, will be able to</p> <ul style="list-style-type: none"> <li>• Understand electric and magnetic fields in matter.</li> <li>• Apply Maxwell's equations to various physical problems.</li> <li>• Calculate EM wave propagation.</li> <li>• Understand the use of Coulomb's Law and Gauss's Law for electrostatic force.</li> <li>• Use of Lorentz force Law for magnetic force.</li> <li>• Use of Faraday's Law in induction problems.</li> <li>• Understand the basic laws that underlie the properties of electric circuit elements.</li> </ul>
3	<b>BPH 203</b>	<b>WAVES AND OPTICS</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the Superposition of two perpendicular Harmonic Oscillations.</li> <li>• Describe the behaviour of a damped and driven harmonic oscillator in both time and frequency domains</li> <li>• Understand the concept of Velocity of Transverse Vibrations of Stretched Strings.</li> <li>• Understand the basics of Superposition of Two Harmonic Waves</li> </ul>
4	<b>BPH203P</b>	<b>WAVES AND OPTICS LAB</b>	<p>On completion of this Lab course, students with the help of experiments, will be able to</p> <ul style="list-style-type: none"> <li>• Understand the Superposition of two perpendicular Harmonic Oscillations.</li> <li>• Describe the behaviour of a damped and driven harmonic oscillator in both time and frequency domains</li> <li>• Understand the concept of Velocity of Transverse Vibrations of Stretched Strings.</li> <li>• Understand the basics of Superposition of Two Harmonic Waves</li> </ul>
5	<b>BPH204</b>	<b>Generic Elective Papers(GE) PHYSICS 2</b>	<p><i>On completion of this course, student will be able to</i></p> <ul style="list-style-type: none"> <li>• <i>Have a basic knowledge of crystal</i></li> </ul>

			<p><i>systems and spatial symmetries.</i></p> <ul style="list-style-type: none"> <li>• <i>Understand the concept of reciprocal space and be able to use it as a tool.</i></li> <li>• <i>Know the significance of Brillouin zones.</i></li> <li>• <i>Know the concept of phonons.</i></li> <li>• <i>Know the principles of structure determination.</i></li> <li>• <i>Show an understanding of wave mechanics</i></li> </ul>
6	BPH204P	PHYSICS 2 LAB	<p><i>On completion of this lab course, student will be able to</i></p> <ul style="list-style-type: none"> <li>• <i>To study Hall effect for given semi conductor material.</i></li> <li>• <i>To determine Planck's constant using photocell.</i></li> <li>• <i>Know the principles of structure determination.</i></li> <li>• <i>Show an understanding of wave mechanics</i></li> <li>• <i>To study the characteristics of photovoltaic cell.</i></li> <li>• <i>To study Zeeman Effect using sodium lamp</i></li> </ul>

**B.Sc. (Hons.) PHYSICS-II**  
**SEMESTER-III**

S. No.	Course code	Course	Course outcome
1	BPH 301	LASERS	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the basic fundamentals of LASER.</li> <li>• Describe the construction and working of different types of lasers.</li> <li>• Explain the relation between Einstein coefficients.</li> <li>• Discuss the applications of lasers- in medical field, in industry field, holography etc.</li> <li>• Explain the attenuation</li> </ul>

			mechanisms.
2	<b>BPH 301P</b>	<b>Lasers Lab</b>	<p>On completion of this lab course, students will have experience of experimentation related to topics like:</p> <ul style="list-style-type: none"> <li>• working of different types of lasers.</li> <li>• basic fundamentals of LASER.</li> <li>• relation between Einstein coefficients.</li> <li>• Spectra study using Nd:YAG, He-Ne LASER.</li> </ul>
3	<b>BPH 302</b>	<b>SOLID STATE PHYSICS-I</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Have a basic knowledge of crystal systems and spatial symmetries.</li> <li>• Understand the concept of reciprocal space and be able to use it as a tool.</li> <li>• Know the significance of Brillouin zones.</li> <li>• Know the concept of phonons.</li> <li>• Know the principles of structure determination.</li> </ul>
4	<b>BPH 302P</b>	<b>SOLID STATE PHYSICS-lab</b>	<p>On completion of this lab course, student will be able to have experience of experiments related to</p> <ul style="list-style-type: none"> <li>• The concept of reciprocal space and be able to use it as a tool Have a basic knowledge of crystal systems and spatial symmetries.</li> <li>• Know the significance of Brillouin zones.</li> <li>• Braggs Law</li> </ul>
5	<b>BPH 303</b>	<b>STATISTICAL PHYSICS AND THERMODYNAMICS</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Identify and describe the statistical nature of concepts and</li> </ul>

			<p>laws in thermodynamics.</p> <ul style="list-style-type: none"> <li>• Use the statistical physics methods such as Boltzmann distribution, Gibbs distribution, Fermi-Dirac and Bose-Einstein distribution.</li> <li>• Apply the concepts and principles of Black-Body radiation to analyze radiation phenomenon.</li> <li>• Apply the concepts and laws of thermodynamics to derive the equation of State of an Ideal Gas from Simple Statistical Consideration.</li> </ul>
<b>6</b>	<b>BPH 303P</b>	<b>STATISTICAL PHYSICS AND THERMODYNAMICS lab</b>	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• describe the statistical nature of concepts and laws in thermodynamics.</li> <li>• Use the statistical physics methods .</li> <li>• Apply the concepts and principles of Black-Body radiation to analyze radiation phenomenon.</li> <li>• Apply the concepts and laws of thermodynamics to derive the equation of State of an Ideal Gas from Simple Statistical Consideration.</li> </ul>
<b>7</b>	<b>BPH 304</b>	<b>SKILL ENHANCEMENT COURSE-I: PHYSICS WORKSHOP SKILLS</b>	<p>On completion of this course, student will be familiar with</p> <ul style="list-style-type: none"> <li>• Meter scale, Vernier caliper, Screw gauge, manufacturing methods like cutting, welding, soldering and the lever mechanism.</li> </ul>

8	<b>BPH 306</b>	<b>Computational Physics Skills</b>	On completion of this course, student will be familiar with Computational Physics Skills
9	<b>BPH 307</b>	<b>Electrical circuits and Network Skills</b>	On completion of this course, student will be familiar with Electrical circuits and Network Skills
10	<b>BPH 308</b>	<b>Basic Instrumentation Skills</b>	On completion of this course, student will be familiar with Basic Instrumentation Skills
11	<b>BPH 309</b>	<b>Renewable Energy and Energy harvesting</b>	On completion of this course, student will be familiar with Renewable Energy and Energy harvesting
12	<b>BPH 310</b>	<b>Technical Drawing</b>	On completion of this course, student will be familiar with Technical Drawing
13	<b>BPH 311</b>	<b>Radiation Safety</b>	On completion of this course, student will be familiar with Radiation Safety
14	<b>BPH 404</b>	<b>Applied Optics</b>	On completion of this course, student will be familiar with Applied Optics
15	<b>BPH312</b>	<b>Weather forecasting</b>	On completion of this course, student will be familiar with weather forecasting techniques.
16	<b>BPH305</b>	<b>PHYSICS 3 Generic Elective Papers(GE)</b>	<p><i>On completion of course, student will be able to</i></p> <ul style="list-style-type: none"> <li>• <i>Identify and describe the statistical nature of concepts and laws in thermodynamics.</i></li> <li>• <i>Apply the concepts and law of thermodynamics to solve problems such as gases, heat engines and refrigerators.</i></li> <li>• <i>Understand the basic fundamentals of LASER.</i></li> <li>• <i>Discuss the applications of lasers-in medical field, in industry field, holography etc.</i></li> <li>• <i>Explain the relation between Einstein coefficients.</i></li> <li>• <i>Understand the spectrum of</i></li> </ul>

			<i>hydrogen atom and coupling scheme</i>
16	BPH304P	PHYSICS 3 LAB	<p><i>On completion of this lab course, student will be able to</i></p> <ul style="list-style-type: none"> <li>• <i>Identify and describe the statistical nature of concepts and laws in thermodynamics.</i></li> <li>• <i>Apply the concepts and law of thermodynamics to solve problems such as gases, heat engines and refrigerators.</i></li> <li>• <i>To determine refractive index of simple prism.</i></li> <li>• <i>To determine the principal points of a lens system.</i></li> <li>• <i>To find the coefficient of thermal conductivity of poor conductor by Lee's method.</i></li> <li>• <i>To find the coefficient of thermal conductivity of poor conductor by Searl's method.</i></li> </ul>

**B.Sc. (Hons.) PHYSICS-II**  
**SEMESTER-IV**

S. No.	Course code	Course	Course outcome
1	BPH 401	<b>SOLID STATE PHYSICS-II</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• To calculate thermal and electrical properties in the free-electron model.</li> <li>• Know Bloch's theorem and about energy bands.</li> <li>• Understand the fundamental principles of semiconductors, including pn-junction, and be able to estimate the charge carrier mobility and density.</li> <li>• To account for what the Fermi surface is and how it can be measured.</li> <li>• Know basic models of magnetism.</li> </ul>

<b>2</b>	<b>BPH 401P</b>	<b>SOLID STATE PHYSICS-II lab</b>	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• Calculate the energy band gap and characteristics of pn-junction diode and be able to estimate the charge carrier mobility and density.</li> <li>• Plot B-H curve</li> <li>• Know basic models of magnetism.</li> </ul>
<b>3</b>	<b>BPH 402</b>	<b>QUANTUM MECHANICS</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Show an understanding of wave mechanics in three dimensions.</li> <li>• Describe the structure of the hydrogen atom and show an understanding of quantization of angular momentum</li> <li>• Apply techniques such as fourier methods and ladder operators for selected problems in quantum mechanics</li> <li>• Use the tools, methodologies, language and conventions of physics test and communicate ideas and explanations</li> </ul>
<b>4</b>	<b>BPH 402P</b>	<b>QUANTUM MECHANICS lab</b>	<p>On completion of this lab course, student will be able to</p> <ul style="list-style-type: none"> <li>• Show an understanding of wave mechanics in three dimensions.</li> <li>• Use the tools, methodologies, language and conventions of physics test and communicate ideas and explanations</li> </ul>
<b>5</b>	<b>BPH 403</b>	<b>SPECTROSCOPY</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Describe the atomic spectra of one and two valence electron atoms</li> <li>• Explain the change in behavior of atoms in external applied electric and magnetic field</li> <li>• Explain rotational, vibrational, electronic and Raman spectra of</li> </ul>

			<p>molecules</p> <ul style="list-style-type: none"> <li>• Describe electron spin and nuclear magnetic resonance spectroscopy and their applications.</li> </ul>
6	BPH 403 P	SPECTROSCOPY lab	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• Describe the atomic spectra of one and two valence electron atoms</li> <li>• Explain the change in behavior of atoms in external applied electric and magnetic field</li> <li>• Explain rotational, vibrational, electronic and Raman spectra of molecules</li> <li>• Describe electron spin and nuclear magnetic resonance spectroscopy and their applications.</li> </ul>
7	BPH 404	SKILL ENHANCEMENT COURSE-II: APPLIED OPTICS	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the theory of laser action, light amplification, principle and application of holography and fibre optics.</li> </ul>
8	BPH405	PHYSICS 4 Generic Elective Papers(GE)	<p><i>On completion of this course, student will be able to</i></p> <ul style="list-style-type: none"> <li>• Understand the Co-ordinate systems and motion of particle.</li> <li>• Describe central force, centre mass and features of central force motion.</li> <li>• Explain inertial and non-inertial frames.</li> <li>• Understand the concept of vector algebra and calculus.</li> <li>• Apply Stoke's Theorem, Green's Theorem and Gauss divergence theorem.</li> <li>• Understand the concept of electric field, electric potential, and electric current.</li> </ul>

<b>9</b>	<b>BPH405P</b>	<b>PHYSICS 4LAB</b>	<p><i>On completion of this lab course, student will be able to</i></p> <ul style="list-style-type: none"> <li>• To determine the Moment of Inertia of a Flywheel.</li> <li>• To determine the Young's Modulus of a Wire.</li> <li>• Determine the value of g by kater pendulum.</li> <li>• Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope</li> </ul>
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**B.Sc. (Hons.) PHYSICS-III**  
**SEMESTER-V**

<b>S. No.</b>	<b>Course code</b>	<b>Course</b>	<b>Course outcome</b>
<b>1</b>	<b>BPH 501</b>	<b>MATHEMATICAL PHYSICS-II</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Apply separation of variables technique to solve partial differential equations.</li> <li>• Apply the method of Frobenius to solve certain ordinary differential equations (Legendre, Bessel etc.)</li> <li>• Understand the concept of Laplace function</li> <li>• Evaluate integrals using gamma and beta functions</li> <li>• Know the rules to find systematic errors.</li> </ul>
<b>2</b>	<b>BPH 501P</b>	<b>MATHEMATICAL PHYSICS-II lab</b>	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• FORTRAN Programming</li> </ul>
<b>3</b>	<b>BPH 502</b>	<b>DIGITAL SYSTEMS</b>	<p>On completion of this course, students</p>

		<b>AND APPLICATIONS</b>	<p>will be able to</p> <ul style="list-style-type: none"> <li>• Understand the fundamental concepts and techniques used in digital electronics.</li> <li>• To analyze and design various combinational and sequential circuits.</li> <li>• Have the ability to identify and prevent various hazards and timing problems in a digital design.</li> <li>• Explain the basic features of CRO, deflection sensitivity and application of CRO.</li> <li>• Describe the general architecture of a microprocessor.</li> <li>• Understand and realize the interfacing of memory and various I/O devices with 8085 microprocessors.</li> </ul>
<b>4</b>	<b>BPH 502 P</b>	<b>DIGITAL SYSTEMS AND APPLICATIONS lab</b>	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the fundamental concepts and techniques used in digital electronics.</li> <li>• To analyze and design various combinational and sequential circuits.</li> <li>• Have the ability to identify and prevent various hazards and timing problems in a digital design.</li> <li>• Explain the basic features of CRO, deflection sensitivity and application of CRO.</li> <li>• Describe the general architecture of a microprocessor.</li> <li>• Understand and realize the interfacing of memory and various I/O devices with 8085 microprocessors.</li> </ul>
<b>5</b>	<b>BPH 503</b>	<b>CLASSICAL DYNAMICS</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Define and understand basic mechanical concepts related to</li> </ul>

			<p>discrete and continuous mechanical systems.</p> <ul style="list-style-type: none"> <li>• Describe and understand the motion of a mechanical system using Lagrange-Hamiltonian formalism.</li> <li>• Familiar with the concept of special theory of relativity.</li> <li>• Derive Lorentz transformation equations by using special theory of relativity.</li> <li>• Define four dimensional space and deduce the transformation formulae between <math>\mathbf{E}, \mathbf{B}, \mathbf{J}, \rho</math></li> </ul>
<b>6</b>	<b>BPH 503P</b>	<b>CLASSICAL DYNAMICS Lab</b>	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• Define and understand basic mechanical concepts related to discrete and continuous mechanical systems.</li> <li>• Describe and understand the motion of a mechanical system using Lagrange-Hamiltonian formalism.</li> <li>• Familiar with the concept of special theory of relativity.</li> <li>• Derive Lorentz transformation equations by using special theory of relativity.</li> <li>• Define four dimensional space and deduce the transformation formulae between <math>\mathbf{E}, \mathbf{B}, \mathbf{J}, \rho</math></li> </ul>
<b>7</b>	<b>BPH 504</b>	<b>NUCLEAR AND PARTICLE PHYSICS</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• understand nuclear properties such as binding energy, nuclear moments.</li> <li>• understand the Constituents of nucleus.</li> <li>• Modes of decay of radioactive nuclides.</li> <li>• understand the decay Laws.</li> <li>• understand nature about</li> </ul>

			<p>particle and antiparticles</p> <ul style="list-style-type: none"> <li>• how particle and antiparticles exist in nature.</li> <li>• understand how nuclear particles can be detected with the help of detectors.</li> </ul>
<b>8</b>	<b>BPH 504 P</b>	<b>NUCLEAR AND PARTICLE PHYSICS lab</b>	<p>On completion of this lab course, student will be able to</p> <ul style="list-style-type: none"> <li>• understand nuclear properties such as binding energy, nuclear moments.</li> <li>• understand the Constituents of nucleus.</li> <li>• Modes of decay of radioactive nuclides.</li> <li>• understand the decay Laws.</li> <li>• understand nature about particle and antiparticles</li> <li>• how particle and antiparticles exist in nature.</li> <li>• understand how nuclear particles can be detected with the help of detectors.</li> </ul>
9	BPH505	Electromagnetic Theory	On completion of this course, students will be able to learn Electromagnetic Theory .
10	BPH505 (P)	Electromagnetic Lab	On completion of this course, students will be able to learn Electromagnetic Theory .
11	BPH506	Radiation Physics	On completion of this course, students will be able to learn Radiation Physics
12	BPH506 (P)	Radiation Physics Lab	On completion of this course, students will be able to learn Radiation Physics
13	BPH507	Special Theory of Relativity	On completion of this course, students will be able to learn Special Theory of Relativity

14	BPH507 (P)	Special Theory of Relativity Lab	On completion of this course,students will be able to learn Special Theory of Relativity
15	BPH508	Applied Dynamics	On completion of this course,students will be able to learn Applied Dynamics
16	BPH508 (P)	Applied Dynamics Lab	On completion of this course,students will be able to learn Applied Dynamics
17	BPH509	Atmospheric Physics	On completion of this course,students will be able to learn Atmospheric Physics
18	BPH509(P)	Atmospheric Physics Lab	On completion of this course,students will be able to learn Atmospheric Physics
19	BPH510	Atomic And Molecular Physics	On completion of this course,students will be able to learn Atomic And Molecular Physics
20	BPH510 (P)	Atomic And Molecular Physics Lab	On completion of this course,students will be able to learn Atomic And Molecular Physics
21	BPH511	Classical Dynamics	On completion of this course,students will be able to learn Classical Dynamics
22	BPH511 (P)	Classical Dynamics Lab	On completion of this course,students will be able to learn Classical Dynamics
23	BPH512	Computational Methods And Simulations	On completion of this course,students will be able to learn Computational Methods And Simulations
24	BPH512 (P)	Computational Methods And Simulations Lab	On completion of thisLab course,students will be able to learn Computational Methods And Simulations
25	BPH513	Electronics And Network Theory	On completion of this course,students will be able to learn Electronics And Network Theory
26	BPPH513 (P)	Electronics And Network Theory Lab	On completion of this lab course,students will be able to learn Electronics And Network Theory.

27	BPH514	Experimental Techniques	On completion of this course,students will be able to learn Experimental Technique
28	BPH514(P)	Experimental Techniques Lab	On completion of this lab course,students will be able to learn Experimental Techniques
29	BPH515	Material Science	On completion of this course,students will be able to learn Material Science
30	BPH515 (P)	Material Science Lab	On completion of this lab course,students will be able to learn Material Science
31	BPH516	Medical Physics	On completion of this course,students will be able to learn Medical Physics
32	BPH516 (P)	Medical Physics Lab	On completion of this lab course,students will be able to learn Medical Physics
33	BPH517	Embedded System: Introductions To microcontrollers	On completion of this course,students will be able to learn Embedded System: Introductions To microcontrollers
34	BPH517 (P)	Embedded System: Introductions To microcontrollers Lab	On completion of this lab course,students will be able to learn Embedded System: Introductions To microcontrollers
35	BPH518	Nano Materials and Applications	On completion of this course,students will be able to learn Nano Materials and Applications
36	BPH518 (P)	Nano Materials and Applications Lab	On completion of thislab course,students will be able to learn Nano Materials and Applications
37	BPH519	Nuclear Physics	On completion of this course,students will be able to learn Nuclear Physics
38	BPH519(P)	Nuclear Physics Lab	On completion of this lab course,students will be able to learn Nuclear Physics
39	BPH520	Particle Physics	On completion of this course,students will be able to learn Particle Physics
40	BPH520 (P)	Particle Physics Lab	On completion of this lab course,students will be able to learn Particle Physics
41	BPH521	Physics of Devices and Instruments	On completion of this course,students will be able to learn Physics of Devices and Instruments
42	BPH521 (P)	Physics of Devices and Instruments Lab	On completion of this lab course,students will be able to learn Physics of Devices and Instruments

**B.Sc. (Hons.) PHYSICS-III**  
**SEMESTER-VI**

S. No.	Course code	Course	Course outcome
1	BPH 601	MATHEMATICAL PHYSICS-III	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Perform basic algebra manipulation with complex numbers.</li> <li>• Understand the geometric interpretation of complex numbers.</li> <li>• Know the method of contour integration, evaluate definite integrals of varying complexity.</li> <li>• Learn the fundamentals and applications of Fourier series, Fourier and Laplace transforms, their inverse transforms etc.</li> <li>• Expand Laurent and Taylors's series</li> </ul>
2	BPH 601P	MATHEMATICAL PHYSICS-III Lab	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• Perform basic algebra manipulation</li> <li>• Programming in Fortran 77</li> </ul>
3	BPH 602	ANALOG SYSTEMS AND APPLICATIONS	<p>On completion of this course,students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the biasing of transistors and design of simple amplifier circuits</li> <li>• Methods of calculating cutoff frequencies and to determine bandwidth.</li> <li>• Understand the current voltage characteristics of semiconductor devices.</li> <li>• Learn basic operational amplifiers characteristics, OP-AMP parameters, applications as inverter, integrator, differentiator etc.</li> <li>• Understand the effect of positive and negative feedback on amplifier circuits.</li> <li>• Analyze the different oscillator</li> </ul>

			circuits to determine the frequency of oscillation.
<b>4</b>	<b>BPH 602P</b>	<b>ANALOG SYSTEMS AND APPLICATIONS lab</b>	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the biasing of transistors and design of simple amplifier circuits</li> <li>• Methods of calculating cutoff frequencies and to determine bandwidth.</li> <li>• Understand the current voltage characteristics of semiconductor devices.</li> <li>• Learn basic operational amplifiers characteristics, OP-AMP parameters, applications as inverter, integrator, differentiator etc.</li> <li>• Understand the effect of positive and negative feedback on amplifier circuits.</li> <li>• Analyze the different oscillator circuits to determine the frequency of oscillation.</li> </ul>
<b>5</b>	<b>BPH 603</b>	<b>EMBEDDED SYSTEM:INTRODUCTION TO MICROCONTROLLERS</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the characteristics of devices like Microcontroller and its review.</li> <li>• Describe working of 8051 microcontroller.</li> <li>• Understand the processing of microcontroller and I/O port programming.</li> <li>• Learn about timer and counter programming.</li> <li>• Understand the serial port programming.</li> </ul>
<b>6</b>	<b>BPH 603P</b>	<b>EMBEDDED SYSTEM:INTRODUCTION TO MICROCONTROLLERS Lab</b>	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the characteristics of devices like Microcontroller and its review.</li> </ul>

			<ul style="list-style-type: none"> <li>• Describe working of 8051 microcontroller.</li> <li>• Understand the processing of microcontroller and I/O port programming.</li> <li>• Learn about timer and counter programming.</li> <li>• Understand the serial port programming.</li> </ul>
<b>7</b>	<b>BPH 604</b>	<b>MATERIALS SCIENCE</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand internal structure of materials.</li> <li>• Learn about crystal structure and imperfections and phase diagrams etc.</li> <li>• Understand the elastic properties</li> <li>• Learn applications of techniques for thickness measurements etc.</li> </ul>
<b>8</b>	<b>BPH 604P</b>	<b>MATERIALS SCIENCE Lab</b>	<p>On completion of this lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand internal structure of materials.</li> <li>• Learn about crystal structure and imperfections and phase diagrams etc.</li> <li>• Understand the elastic properties</li> <li>• Learn applications of techniques for thickness measurements etc.</li> </ul>

**Programme Specific Outcomes and Course Outcomes**  
**Program Name: Master of Science Physics (M. Sc. Physics)**  
**SESSION 2019-20**

Program Educational Objectives (PEO)

**Program Name: - MASTER OF SCIENCE PHYSICS (M. Sc. Physics)**

Program Code:- MSPHY

The program aims are

- PEO 1.** To equip students with conceptual knowledge about various scientific areas.
- PEO 2.** To inculcate innovative, creative and observational mindset among the students.
- PEO 3.** To improve experimentation, presentation, interpersonal, decision making and leadership skills of the students
- PEO 4.** To enable students to use knowledge and practical skills learnt during the program in identifying and solving problems of scientific areas
- PEO 5.** To create awareness about importance of human values, professional ethics and research initiative in the scientific world

Program Outcomes (PO) Post Graduate Program (PG)

Program Name: - MASTER OF SCIENCE PHYSICS

(M. Sc. Physics)

Program Code:- MSPHY

After completing Post graduate program in Physical Science, a student will be

- PO 1.** Able to possess the understanding of conceptual knowledge and practical skills required for application in real world.
- PO 2.** Able to select and apply fundamental principles, concepts, theories and models of physics for delivering their job duties in various fields like in teaching, research, industry etc.
- PO 3.** Able to possess requisite experimentation and technical skills, teamwork and

leadership skills and will be able to effectively discharge their responsibilities as Physicist.

**PO 4.** Able to develop an appreciation for the fundamental concepts and working of devices used in everyday life employing scientific methods/tools of physics.

**PO 5.** Able to develop a flavour of how research leads to new findings.

**PO 6.** To use experimental apparatus and computers as a tool for scientific investigations/understanding.

### Program Specific Outcomes (PSO)

## **Program Name: - MASTER OF SCIENCE PHYSICS (M. Sc. Physics)**

Program Code:- MSPHY

**PSO 1.** Understanding the basic concepts of physics particularly concepts in classical mechanics, quantum mechanics, statistical mechanics and electromagnetic theory to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws through logical and mathematical reasoning.

**PSO 2.** Learn to carry out experiments in basic as well as certain advanced areas of physics such as nuclear physics, condensed matter physics, nanoscience, lasers and electronics.

**PSO 3.** Understand the basic concepts of certain sub fields such as nuclear, atomic and molecular physics, solid state physics, plasma physics and experimental techniques in physics etc.

**PSO 4.** Gain hands-on experience to work in applied fields.

**PSO 5.** Gain a thorough grounding in the subject to be able to teach it at college and school levels.

**PSO 6.** Viewing physics as a training ground for the mind developing a critical attitude

**PSO 7.** To develop research centered approach that can be applied to diverse fields.

**PSO 8.** Apply knowledge of Physics to solve the complex scientific problems and become competent professional at global level.

**Course Outcomes:**

**M.Sc. (PHYSICS)-I**  
**SEMESTER-I**

<b>S. No.</b>	<b>Course code</b>	<b>Course</b>	<b>Course outcome</b>
<b>1</b>	<b>P1.1.1</b>	<b>Mathematical Physics-I</b>	On completion of this course, student will be able to <ul style="list-style-type: none"><li>• To understand Generating function for Legendre polynomials and recurrence relations.</li><li>• Apply the method to solve certain ordinary differential equations (Legendre, Bessel etc.)</li><li>• Understand the concept of hermite and Laguerre Polynomials.</li><li>• Evaluate integrals using gamma and beta functions.</li><li>• Know the rules to find systematic error and Tensors.</li></ul>
<b>2</b>	<b>P1.1.2</b>	<b>Classical Mechanics</b>	On completion of this course, student will be able to <ul style="list-style-type: none"><li>• define and understand basic mechanical concepts related to discrete and continuous mechanical systems,</li><li>• Describe and understand the motion of a mechanical system using Lagrange-Hamiltonian formalism.</li><li>• Students will be able to solve problems related to mechanics and Kepler's problem.</li><li>• Understanding the Rigid body dynamics and Hamiltonian formulation.</li></ul>
<b>3</b>	<b>P1.1.3</b>	<b>Quantum Mechanics</b>	On completion of this course, student will be able to <ul style="list-style-type: none"><li>• Understand the basic knowledge</li></ul>

			<p>about non relativistic quantum mechanics.</p> <ul style="list-style-type: none"> <li>• Understand the time-dependent and time-independent Schrodinger wave equation for simple potentials and harmonic oscillator.</li> <li>• Show an understanding of wave mechanics in one and three dimensions, Linear vector spaces.</li> <li>• Describe the structure of the hydrogen atom and show an understanding of quantization of angular momentum</li> <li>• Know about spin, angular momentum states, angular momentum addition rules and identical particles.</li> </ul>
<b>4</b>	<b>P1.1.4</b>	<b>Nuclear and Particle Physics</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the fundamental aspects of the structure of the nucleus and intrinsic properties of the atomic nucleus,</li> <li>• explain the interaction of radiation, charged particles and neutrons with matter,</li> <li>• Understand the concepts of radioactive decay, laws of radioactive decay and successive disintegration.</li> </ul>
<b>5</b>	<b>P1.1.5 Elective Paper Option (i)</b>	<b>Electronics -I</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the Active circuit model's equivalent circuit for BJT.</li> <li>• Methods of calculating cutoff frequencies and to determine bandwidth.</li> <li>• Understand the current voltage characteristics of semiconductor devices.</li> <li>• Learn basic operational amplifiers characteristics, OP-AMP parameters, applications as inverter, integrator, differentiator etc.</li> <li>• Understand the effect of biasing</li> </ul>

			<p>in FET.</p> <ul style="list-style-type: none"> <li>Analyze the number systems, combinational logic gates, binary counters.</li> </ul>
6	<b>P1.1.5 Elective Paper Option (ii)</b>	<b>Remote sensing</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>Understand the remote sensing, sensors, microwaves and image analysis concepts.</li> </ul>
7	<b>P1.1.5 Elective Paper Option (iii)</b>	<b>Microwave and its propagation</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>Understand the Microwave linear beam tubes, transistors and tunnel diodes</li> <li>Understand the Microwave transmission lines.</li> </ul>
8	<b>P1.1.6</b>	<b>Laboratory Practice</b> (i) <b>Electronics</b> (ii) <b>LASER optics lab</b>	<p>On completion of this Lab course, students will be able to</p> <ul style="list-style-type: none"> <li>Understand the Active circuit model's equivalent circuit for BJT.</li> <li>Methods of calculating cutoff frequencies and to determine bandwidth.</li> <li>Understand the current voltage characteristics of semiconductor devices.</li> <li>Learn basic operational amplifiers characteristics, OP-AMP parameters, applications as inverter, integrator, differentiator etc.</li> <li>Understand the effect of biasing in FET.</li> <li>Understand Telescope , microscope working etc.</li> <li>Analyze the number systems, combinational logic gates, binary counters.</li> </ul>

**M.Sc. (PHYSICS)-I**  
**SEMESTER-II**

S. No.	Course code	Course	Course outcome
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1	P1.2.1	<b>MATHEMATICAL PHYSICS-II</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the Laplace transforms.</li> <li>• Understand proof of Fundamental Theorem of Calculus and the concept of the integrals of functions and vector field</li> <li>• Explain Complex variables, Fourier series and transform.</li> <li>• Understand the Partial differential equations, apply formulae to solve problems like One dimensional wave equation</li> </ul>
2	P1.2.2	<b>NUCLEAR PHYSICS</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Demonstrate knowledge of fundamental aspects of the structure of the nucleus, radioactive decay, nuclear reactions and the interaction of radiation and matter.</li> <li>• Explain internal and external properties of the atomic nucleus.</li> <li>• Explain the processes of nuclear collisions and nuclear reactions.</li> <li>• State radiation detectors and accelerators.</li> <li>• Understand the nuclear accelerators and models</li> </ul>
3	P1.2.3	<b>STATISTICAL MECHANICS</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Identify and describe the statistical nature of concepts and laws in thermodynamics.</li> <li>• Use the statistical physics methods such as Boltzmann distribution, Gibbs distribution, Fermi-Dirac and Bose-Einstein distribution.</li> <li>• Body radiation to analyze radiation phenomenon.</li> <li>• Apply the concepts and laws of thermodynamics to solve problems such as gases, heat engines</li> </ul>
4	P1.2.4	<b>CLASSICAL ELECTRODYNAMICS</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Interpret the deeper meaning of Maxwell field equation.</li> <li>• Formulate and solve electromagnetic problems with the help of electrodynamic potential.</li> </ul>

			<ul style="list-style-type: none"> <li>• Formulate and solve electrodynamic problems in relativistic covariant form in four dimensional space-time.</li> </ul>
5	<b>P1.2.5 Elective Paper Option (i)</b>	<b>ELECTRONICS-II</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the amplifiers and their applications.</li> <li>• Methods of calculating cutoff frequencies and to determine bandwidth.</li> <li>• Understand the current voltage characteristics of semiconductor devices.</li> <li>• Learn basic operational amplifiers characteristics, OP-AMP parameters, applications as Comparator etc.</li> <li>• Analyze 555 timer.</li> </ul>
6	<b>P1.2.5 Elective Paper Option (ii)</b>	<b>Physics of electronic devices and fabrication of integrated circuits and systems</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the amplifiers electronic devices and fabrication of integrated circuits and systems</li> <li>• Working of memories like SRAM, DRAM etc.</li> </ul>
7	<b>P1.2.5 Elective Paper Option (iii)</b>	<b>Science and technology of solar hydrogen and other renewable energies</b>	<p>On completion of this course, students will be able to</p> <p>Understand the technology of solar hydrogen and other renewable energies, production, storage and utilization of hydrogen</p>
8	<b>P1.2.6</b>	<b>Laboratory Practice (i)Electronics (ii) LASER optics lab</b>	<p>On completion of this Lab course, students will be able to</p> <ul style="list-style-type: none"> <li>• Methods of calculating cutoff frequencies and to determine bandwidth.</li> <li>• Understand the current voltage characteristics of semiconductor devices.</li> <li>• Learn basic operational amplifiers characteristics, OP-AMP parameters, applications as inverter, integrator, differentiator etc.</li> <li>• Understand the DA and AD</li> <li>• Understand Telescope , microscope</li> </ul>

			working etc.
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**M.Sc. (PHYSICS)-II**  
**SEMESTER-III**

<b>S. No.</b>	<b>Course code</b>	<b>Course</b>	<b>Course outcome</b>
<b>1</b>	<b>P2.3.1</b>	<b>CONDENSED MATTER PHYSICS-I</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Have a basic knowledge of binding in crystal systems and elastic properties.</li> <li>• Understand the concept of various models and theories of condensed matter physics such as Drude model, Free electron theory.</li> <li>• Know the significance of Brillouin zones and band theory and Kronig-Penney model.</li> <li>• Know the concept of phonons.</li> <li>• Understand the concept of Fermi Surfaces, semiconductors and superconductors.</li> </ul>
<b>2</b>	<b>P.2.3.2</b>	<b>LASER and FIBER OPTICS</b>	<p>On completion of this course, students will be able to</p> <ul style="list-style-type: none"> <li>• Understand the basic fundamentals of LASER.</li> <li>• Describe the construction and working of different types of lasers.</li> <li>• Explain the relation between Einstein coefficients and Laser rate equation.</li> <li>• Discuss the applications of lasers-in medical field, in industry field, holography etc.</li> </ul>
<b>3</b>	<b>P2.3.3</b>	<b>ADVANCED CLASSICAL MECHANICS AND ELECTRODYNAMICS</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand covariant formulation of electrodynamics to explore the unification of</li> </ul>

			<p>electricity and magnetism.</p> <ul style="list-style-type: none"> <li>• Understand the concept of Origin of the electromagnetic radiation by an accelerating charge particle.</li> <li>• Understand the scattering of electromagnetic wave by free and bound electron.</li> <li>• Understand the concept of Electromagnetic wave propagation.</li> </ul>
<b>3</b>	<b>P2.3.4 Elective Paper Option (i)</b>	<b>COMPUTATIONAL METHODS AND SIMULATION</b>	<p>On completion of this course, student will be able</p> <ul style="list-style-type: none"> <li>• To understand the tools like FORTRAN language and programming to enhance knowledge of physics.</li> <li>• To have knowledge and application of numerical methods used in computation and programming.</li> <li>• To have understanding of Random Variables and Monte Carlo Methods.</li> </ul>
<b>4</b>	<b>P2.3.4 Elective Paper Option (ii)</b>	<b>Advanced Electronics</b>	<p>On completion of this course, student will be able</p> <ul style="list-style-type: none"> <li>• To understand the digital to analog convertors and analog to digital convertors.</li> <li>• To understand the RAM, 8085 microprocessor.</li> </ul>
<b>5</b>	<b>P2.3.4 Elective Paper Option (iii)</b>	<b>Atomic and molecular spectroscopy</b>	<p>On completion of this course, student will be able</p> <ul style="list-style-type: none"> <li>• To understand the Zeeman, stark effect.</li> <li>• Interaction of rotations and vibrations of molecules.</li> </ul>
<b>6</b>	<b>P2.3.4 Elective Paper Option (iv)</b>	<b>Material Science</b>	<p>On completion of this course, student will be able</p> <ul style="list-style-type: none"> <li>• To understand the crystal diffraction, diffusion in solids.</li> </ul>
<b>7</b>	<b>P2.3.5...</b>	<b>LABORATORY</b>	<p>On completion of this LABcourse, student will be able</p>

		<b>PRACTICE (NUCLEAR AND SOLID STATE PHYSICS LAB)</b>	<ul style="list-style-type: none"> <li>• Understand the fundamental aspects of the structure of the nucleus and intrinsic properties of the atomic nucleus,</li> <li>• explain the interaction of radiation, charged particles and neutrons with matter,</li> </ul> <p>Understand the concepts of radioactive decay, laws of radioactive decay and successive disintegration.</p>
<b>8</b>	<b>P2.3.6</b>	<b>COMPUTER LABORATORY</b>	<p>On completion of this lab course, student will be able</p> <ul style="list-style-type: none"> <li>• To understand the tools like FORTRAN language and programming to enhance knowledge of physics.</li> <li>• To have knowledge and application of numerical methods used in computation and programming.</li> </ul>

**M.Sc. (PHYSICS)-II**  
**SEMESTER-IV**

<b>S. No.</b>	<b>Course code</b>	<b>Course</b>	<b>Course outcome</b>
<b>1</b>	<b>P2.4.1</b>	<b>CONDENSED MATTER PHYSICS-II</b>	<p>On completion of this course, student will be able to learn about</p> <ul style="list-style-type: none"> <li>• Langevin diamagnetism equation, Anti ferromagnetic magnons, Ferromagnetic domains, Crystal field splitting.</li> <li>• Cooling by adiabatic demagnetization, Ferromagnetism, Debye equations, Dipole theory of ferroelectricity.</li> <li>• Nanoparticles, Metal nano clusters (various types), Quantum well, Quantum wire and Quantum dots (in brief) and their fabrication.</li> <li>• Plasmons, polaritons, polarons and Lattice defects, Mott transition.</li> <li>• Burger's vector, Low angle and large angle grain boundaries,</li> </ul>

			Dislocation multiplication by Frank-Read source.
<b>2</b>	<b>P2.4.2</b>	<b>ADVANCED QUANTUM MECHANICS</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand first order and second order perturbation theory for nondegenerate case, an harmonic oscillator.</li> <li>• Learn exchange operators, Variational method, Transition probability for constant and harmonic perturbation, Golden rule.</li> <li>• Understand the Principle of WKB, Born approximation, Optical theorem, s and p-wave scattering.</li> <li>• Understand the theory of Klein-Gordon equation, Dirac equation, spin and magnetic moment.</li> </ul>
<b>3</b>	<b>Elective Paper P.2.4.3 Option (i)</b>	<b>EXPERIMENTAL TECHNIQUES IN PHYSICS</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Learn about thermal evaporation, cathodic sputtering, and glow discharge sputtering.</li> <li>• Understand the analytical and transducers techniques.</li> <li>• Understand the theories of Scanning Electron Microscope, Transmission Electron Microscope, Scanning Tunneling Microscope, Atomic Force Microscope.</li> <li>• Know about the basic concepts and applications of spectroscopic techniques.</li> </ul>
<b>4</b>	<b>Elective Paper P.2.4.4 Option (ii)</b>	<b>RADIATION PHYSICS</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand basics of thermal neutrons like energy distribution of thermal neutrons, effective cross section of thermal neutron.</li> </ul>

			<ul style="list-style-type: none"> <li>• Understand the concept of nuclear chain reaction.</li> <li>• Learn thermal Neutron diffusion, Neutron diffusion equation, Thermal diffusion length.</li> <li>• Analyze nuclear spectrometric data and able to measure g-factors and hyperfine fields.</li> </ul>
<b>5</b>	<b>Elective Paper P.2.4.4 Option (iii)</b>	<b>High Energy physics</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concept like quark model, symmetry properties.</li> <li>• Understand the concept of strong interactions</li> </ul>
<b>6</b>	<b>Elective Paper P.2.4.4 Option (iv)</b>	<b>Theoretical Nuclear Physics</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concept like nuclear forces, deuteron problems and nuclear models</li> </ul>
<b>7</b>	<b>Elective Paper P.2.4.4 Option (v)</b>	<b>Plasma physics</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concept like Boltzmann equations, waves in plasma, MHD Equation.</li> </ul>
<b>8</b>	<b>Elective Paper P.2.4.4 Option (vi)</b>	<b>Electronic Communication systems</b>	<p>On completion of this course, student will be able to</p> <ul style="list-style-type: none"> <li>• Understand the concept like AM, FM, SSP, PAM, PCM, RADAR system.</li> </ul>
<b>9</b>	<b>P 2.4.5</b>	<b>LABORATORY PRACTICE (NUCLEAR AND SOLID STATE PHYSICS LAB)/ Project work</b>	<p>On completion of this LABcourse, student will be able</p> <ul style="list-style-type: none"> <li>• Understand the intrinsic properties of the atomic nucleus,</li> <li>• explain the interaction of radiation, charged particles and neutrons with matter,</li> <li>• Understand the concepts of radioactive decay, laws of radioactive decay and successive disintegration.</li> </ul>
<b>10</b>	<b>P 2.4.6</b>	<b>COMPUTER</b>	<p>On completion of this lab course, student will be able</p>

		<b>LABORATORY</b>	<ul style="list-style-type: none"> <li>• To understand the tools like FORTRAN language and programming to enhance knowledge of physics.</li> <li>• To have knowledge and application of numerical methods used in computation and programming.</li> </ul>
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**Name of Programme: Master of Political Science (MA- Political Science)**

## **Program Educational Objectives (PEO)**

**Program Name: Master of Arts (Political Science)**

**Program Code: MAPLS**

**The Program aims are:** Department of Political Science Mata Gujri College, Fatehgarh Sahib aims to provide the learners a sound base in political studies by an in-depth investigation into broad range of political phenomena at the national, regional and international levels. The Program provides option for specializing in Political Theories, Comparative Politics, International Relations and Indian Government and Politics. Learners would thus acquire skills in political analysis as well as sharpen their critical and analytical abilities.

**PEO 1.** To provide a central knowledge of the core Political Concepts and values that shapes the lives and institutions of society, the analytic expertise indispensable for understanding their relationship to civil society and connect the relationship of political Science to other academic disciplines, with a view to provide successful academic careers in higher Education, Media and Administration.

**PEO 2.** To enable the learners with the thorough understanding of politics, the CONCEPTUAL part of the syllabus is deconstructed chronologically (though not exhaustively) in a reflective and critical manner through papers like ‘Comparative politics’, ‘Western’ and ‘Indian Political thought’ and thinkers and institutions, processes and political development.

**PEO 3.** To increase recognition of the major problems, the leading policies, constitutional framework, and the legal issues confronting contemporary political systems, particularly in India. The INDIAN POLITICS segment is crucial as it examines the prominent ideas that have influenced India’s political trajectory in papers like ‘Indian Political System: Constitution and Institution’, ‘Foreign Policy of India’ and ‘State Politics in India’ in a critical historical – institutional perspective. Such an endeavor is crucial in light of India’s profile in terms of amongst others its size in population, territory, besides its uninterrupted practice of democratic development since India’s Political independence in 1947.

**PEO 4.** To increase knowledge of diverse political systems around the world, including empirical area-based knowledge; broader theoretical understanding of different political systems, institutions and processes; and the changing domestic and global contexts within which they operate, there will be exposure to the papers like ‘International Politics’, ‘Global Politics’, ‘International Organization’, ‘South Asia and World Politics’, ‘Foreign Policy of Major Powers’ etc. This segment seeks to critically evaluate the causal assumptions and norms of governance along with the policy challenges posed by globalization.

**PEO 5.** To broaden the INTERDISCIPLINARY and GENERAL thinking we enable the learners to analyze and critique the political and administrative processes affected by major social trends, leading to Policy change as manifest in Papers like ‘Public Administration’ and ‘Human Rights’. ‘Research Methodology’ course aims at honing the skills of students and prospective researchers by providing a conceptual understanding of the methods, techniques and a research orientation and comprehension of the basic framework of research process which also forms a backdrop of the ‘Project and Viva’ Paper.

**Program Outcomes (PO) for Post Graduate Program**  
**Program Name: Master of Arts (Political Science)**  
**Program Code: MAPLS**

**Students completing the requirements for M.A. degree in Political Science will be able to:**

**PO 1.** Understand the contribution of the main traditions of western political thinkers to political thought.

**PO 2.** Understand the contribution of the main traditions of Indian Political Thought.

**PO 3.** Understand the processes and dynamics of Indian government and politics. It also familiarize with the vital contemporary emerging issues of centre-state relation, political parties, emergence of new leadership at different levels, demand for autonomy movement, ethnic conflicts etc.

**PO 4.** Understand and be able to interrelate the leading theories, literature, and approaches and subfields of international politics and comparative politics

**PO 5.** Demonstrate the ability to outline and defend a vision of politics in areas such as justice, democracy, community, or freedom by means of persuasive writing for a specific audience

**PO 6.** Critically assess the actions of actors in the political process and determine their motives

**PO 7.** Understand the decisions human beings make in political settings, including those regarding the forms of government available and understand the philosophical underpinnings of political systems and, major ideologies and political parties.

**PO 8.** Demonstrate competency with basic tools underlying modern social science research including competency in qualitative and quantitative analysis

## **Program Specific Outcomes (PSO) for Post Graduate Program**

**Program Name: Master of Arts (Political Science)**

**Program Code: MAPLS**

**PSO 1.** To provide a central knowledge of the core Political Concepts and values that shapes the lives and institutions of society, the analytic expertise indispensable for understanding their relationship to civil society and connect the relationship of political Science to other academic disciplines, with a view to provide successful academic careers in higher Education, Media and Administration.

**PSO 2.** To enable the learners with the thorough understanding of politics, the CONCEPTUAL part of the syllabus is deconstructed chronologically (though not exhaustively) in a reflective and critical manner through papers like ‘Comparative politics’, ‘Western’ and ‘Indian Political thought’ and thinkers and institutions, processes and political development.

**PSO 3.** To increase recognition of the major problems, the leading policies, constitutional framework, and the legal issues confronting contemporary political systems, particularly in India. The INDIAN POLITICS segment is crucial as it examines the prominent ideas that have influenced India’s political trajectory in papers like ‘Indian Political System: Constitution and Institution’, ‘Foreign Policy of India’ and ‘State Politics in India’ in a critical historical – institutional perspective. Such an endeavor is crucial in light of India’s profile in terms of amongst others its size in population, territory, besides its uninterrupted practice of democratic development since India’s Political independence in 1947.

**PSO 4.** To increase knowledge of diverse political systems around the world, including empirical area-based knowledge; broader theoretical understanding of different political systems, institutions and processes; and the changing domestic and global contexts within which they operate, there will be exposure to the papers like ‘International Politics’, ‘Global Politics’, ‘International Organization’, ‘South Asia and World Politics’, ‘Foreign Policy of Major Powers’ etc. This segment seeks to critically evaluate the causal assumptions and norms of governance along with the policy challenges posed by globalization.

**PSO 5.** To broaden the INTERDISCIPLINARY and GENERAL thinking we enable the learners to analyze and critique the political and administrative processes affected by major social trends, leading to Policy change as manifest in Papers like ‘Public Administration’ and ‘Human Rights’. ‘Research Methodology’ course aims at honing the skills of students and prospective researchers by providing a conceptual understanding of the methods, techniques and a research orientation and comprehension of the basic framework of research process which also forms a backdrop of the ‘Project and Viva’ Paper.

## Course Outcomes:

MA -1 (Semester-1)		
Course Code	Course Name	Course Outcome
MPOL-101	INDIAN POLITICAL THOUGHT	<ul style="list-style-type: none"><li>• Be able to showcase a basic understanding over some critical issues and debates within Indian political thought.</li><li>• Be able to have a thorough understanding of comparative study of thinkers on similar concepts.</li><li>• Understand the various political thinkers in different historical backdrop and different environment shaping them.</li><li>• Understand nature and value of normative thinking.</li><li>• Demonstrate the concepts of political thinkers in the context of new situations.</li></ul>
MPOL-102	WESTERN POLITICAL THOUGHT	<ul style="list-style-type: none"><li>• Have a preliminary understanding over major themes within Western political thought.</li><li>• Have information about the ways in which western political thinkers responded to the political problems of their times and the way in which they contributed to a broader view about human goals and needs, justice, democracy and the ever changing relationship between the citizen and the state.</li><li>• Find out how various political philosophies have shaped various forms of government, from tyranny to republican democracy and welfare.</li><li>• Have a better understanding of questions concerning power, justice, rights, laws and other issues pertaining to governance, how they have come about and to what effect.</li><li>• Gain a critical perspective on the present day by evaluating the strengths and weaknesses of various regimes and philosophical approaches.</li></ul>
MPOL-103	INDIAN GOVERNMENT AND POLITICS	<ul style="list-style-type: none"><li>• Be able to have a fundamental understanding of working of Indian government in the backdrop of the critical Constitutional debates.</li><li>• Be able to know how Indian political system has been working and the way it shapes institutions India and how institutions are shaped through interaction with actual politics.</li></ul>

		<ul style="list-style-type: none"> <li>• Understand the idea of political system and the account of the making and working of constitutional institutions.</li> <li>• Be able to understand how the constitution was adopted and why not some other, how the institutions grow in the company of actual politics.</li> <li>• Critically analyze how to identify and explain the central principles, institutions, procedures, and decision-making processes of the Indian political system.</li> <li>• Evaluate the basic strengths and weaknesses of the Indian political system through the application of political concepts and ideas.</li> </ul>
MPOL-104	INTERNATIONAL POLITICS	<ul style="list-style-type: none"> <li>• Understand the fundamental concepts, issues, and theories central to international politics.</li> <li>• Demonstrate capacity to theories and explain political outcomes.</li> <li>• Demonstrate familiarity with current political debates.</li> <li>• Demonstrate skills in critical thinking.</li> <li>• Demonstrate knowledge of social scientific inquiry norms and standards.</li> <li>• Demonstrate knowledge to political systems.</li> <li>• Apply theories and concepts to new situations</li> </ul>
<b>MA -1 (Semester-2)</b>		
MPOL-201	MODERN INDIAN POLITICAL THOUGHT	<ul style="list-style-type: none"> <li>• Understand Indian political thinking through modern Indian political thinkers developed during the times of freedom struggle.</li> <li>• Identify the role and contribution of modern Indian political thinkers in Indian political thought and freedom movement.</li> </ul>
MPOL-202	CONTEMPORARY ISSUES IN GLOBAL POLITICS	<ul style="list-style-type: none"> <li>• Understand key issues and identify major challenges in global politics in the twenty first century.</li> <li>• Demonstrate the understanding of basic facts about the world.</li> <li>• Think analytically about the implementation of international human rights law and its limits in national setting.</li> </ul>
MPOL-203	LIBERAL POLITICAL THEORY	<ul style="list-style-type: none"> <li>• Understand liberal political thinkers and ideology developed by key western political thinkers.</li> </ul>

MPOL-204	DEMOCRACY IN INDIA	<ul style="list-style-type: none"> <li>• Be able to understand democratic institutions and processes in India.</li> <li>• Be able to understand the socio-economic factors influencing Indian democratic setup.</li> <li>• Trace the evolution of Local self-Government in India.</li> <li>• Be able to understand emerging trends in Indian democracy.</li> </ul>
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**MA -2 (Semester-3)**

<b>Course Code</b>	<b>Course Name</b>	<b>Course Outcome</b>
MPOL-301	CONTEMPORARY POLITICAL THOUGHT	Understand some critical concerns and debates within contemporary political thought.
MPOL-302	MODERN POLITICAL ANALYSIS	Have a competence to understand nature, scope and conceptual debates in contemporary political analysis.
MPOL-303	POLITICAL IDEOLOGIES	Be aware of mainstream political ideologies and critical challenges to these ideologies
MPOL-304-A	SIKH POLITICAL THOUGHT (1469 -1708)	Be able to have a broad understanding over some critical political issues and debates in Sikhism.
MPOL-304-B	POLITICAL SOCIOLOGY	Critically understand major themes and issues in political sociology with special reference to India.
MPOL-304-C	FEDERALISM IN INDIA	Have a critical understanding over theory and practice of federalism in India.
MPOL-304-D	SOUTH ASIAN POLITICAL SYSTEMS	Have a competence in political institutions, processes and issues in South Asia in contemporary context.
MPOL-404-E	INTERNATIONAL ORGANISATION	Understand the functioning of specialized international organizations with special reference to the United nations and its specialized agencies.
MPOL-404-F	THEORY AND PRACTICE OF DIPLOMACY	Be able to understand the various aspects, issues and techniques of diplomacy from traditional to contemporary.

MPOL-404-G	SOUTH ASIA AND WORLD POLITICS	Have a competence in understanding of the role of South Asia for the major global issues and challenges.
MPOL-404-H	POLITICS OF DEVELOPING COUNTRIES	Be able to understand some political debates and challenges within contemporary developing countries.
<b>MA -2 (Semester-4)</b>		
<b>Course Code</b>	<b>Course Name</b>	<b>Course Outcome</b>
MPOL-401	THEORY AND PRACTICE OF PUBLIC ADMINISTRATION	Analyze the basic principles, issues and theories in the field of administration.
MPOL-402	COMPARATIVE POLITICS	Acquisition of conceptual understanding of comparative politics.
MPOL-403	PUNJAB POLITICS	Locate the critical issues, debates and emerging trends in the politics of Punjab.
MPOL-404-A	ELECTORAL POLITICS IN INDIA	Understand the working of electoral system in India and challenges to it.
MPOL-404-B	RESEARCH METHODOLOGY	Have a competence to learn and understand the various techniques and methods to conduct research.
MPOL-404-C	CONTEMPORARY DEBATES IN POLITICAL THEORY	Be able to understand the basics of major themes in contemporary political ideologies
MPOL-404-D	FOREIGN POLICY OF US, RUSSIA, CHINA AND JAPAN	Thoroughly understand foreign policy in comparative perspective.
MPOL-404-E	HUMAN RIGHTS IN INTERNATIONAL RELATIONS	Assess and critically understand various issues and challenges to human rights in the contemporary international relations.
MPOL-404-F	INTERNATIONAL LAW	Basic understanding of issues and concerns related to International Law.
MPOL-404-G	POLITICS OF THIRD WORLD	Have a competence to understand global issues in the context of the third world countries.
MPOL-404-H	GLOBALISATION AND ITS IMPACT	Locate the key trends of globalization in the background of emerging global challenges.

## **The Program Specific Outcomes and Course Outcomes of all the Programmes**

### **Program Name: Master of Psychology 2019-20**

PROGRAM CODE: - MAPSY

Students in the Master of Arts in Psychology program graduate based on the following student outcomes:-

- P.O.1.** Students will be able to harmonize the knowledge learnt and apply it to their lives.
- P.O.2.** Students will be able to appreciate the value of cultural diversity and they will possess the skills necessary to utilize their sensitivities within their professional lives.
- P.O.3.** Students will be able to comprehend the application of psychological principles in applied areas of Psychology and would be able to apply them in professional areas.
- P.O.4** Students will be able to display and practice professional ethics and commitment.
- P.O.4** Students will be able to effectively present and analyze quantitative data in research.

### **PROGRAM SPECIFIC OUTCOME (PSO)**

PROGRAM NAME: - MASTER OF ARTS

PROGRAM CODE: - MAPSY

After completing the Master of Arts in Psychology program:-

- P.S.O.1.** Students will be able to demonstrate the advance knowledge of major theoretical concepts in Psychology.
- P.S.O.2.** Students will possess an advance level of competence in research methods and various statistical techniques utilized in empirical research in Psychology.
- P.S.O.3.** Students will be able to demonstrate breadth of knowledge of various Psychological issues and clinical interventions.
- P.S.O.4.** Students will be able to synthesize conceptual knowledge and apply it to clinical settings to contribute to the enhancement of mental health of society at large.
- P.S.O.5** Students will be able to demonstrate understanding of various assessment tools and strategies in the field of Psychology.

### **PROGRAM EDUCATIONAL OUTCOME (PEO)**

PROGRAM NAME: - MASTER OF ARTS

PROGRAM CODE: - MAPSY

After completing the Master of Arts in Psychology program :-

**P.E.O 1** Students will be able to understand methodological approaches to psychological understanding including experimentation, observation, interviewing, using self report measures and various instrument.

**P.E.O 2** Students will be able to develop specialized skills suited to specific sub fields of psychology like conducting case studies; mental status examination, using projective tests and administering psychometric tests and interpreting them are required.

**P.E.O 3** Students will be able to use quantitative analysis in projects and reporting the same.

**P.E.O 4** Students will be able to deal with conflicting theories and approaches, learning to withstand ambiguities and understanding the limitations of the discipline.

**P.E.O 5** Students will be able to work both independently and in group and dealing effectively with clients and stakeholders along the art of negotiation.

**Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
MAPSY-101	Systems and Theories of Psychology	<ol style="list-style-type: none"><li>1. The student shall be able to understand the process of knowledge building in Psychology</li><li>2. The students would gain theoretical knowledge of historical developments in the field of Psychology.</li><li>3. The students will develop understanding of different school of thoughts that shaped Psychology as science.</li><li>4. The student shall be able to understand the significant contributions of major schools of Psychology</li></ol>

MAPSY-102	Social Psychology	<ol style="list-style-type: none"> <li>1. The students will have understanding of some of the major theoretical perspectives in social psychology</li> <li>2. The students will gain knowledge about how individual behaviour is influenced by socio-cultural factors.</li> <li>3. The knowledge will enable the student to understand and explain behaviour in the social setting</li> <li>4. The students shall be able to understand causes of human behavior and the psychological aspect of various social issues in the society and nation</li> </ol>
MAPSY-103	Experimental Psychology	<ol style="list-style-type: none"> <li>1. The students will have understanding of the basics of experimental psychology.</li> <li>2. The students will gain knowledge about the applications of experimental psychology in learning, cognition and motivation.</li> <li>3. The students shall be able to use the conceptual and experimental knowledge of conditioning in further research and its applications in everyday situations</li> </ol>
MAPSY-104	Research Methods and Statistics in Psychology	<ol style="list-style-type: none"> <li>1. The students will have understanding of research methodology as a process</li> <li>2. The students will be able to use correlational techniques and various statistical techniques for psychological research</li> <li>3. The students will develop thorough understanding of parametric and non-parametric techniques.</li> <li>4. The knowledge will help the students to handle data at individual testing and then for the group.</li> </ol>

MAPSY-105	Practicals (Familiarization with Psychological instruments, Field Studies & Computers)	<ol style="list-style-type: none"> <li>1. The students will be able to learn and make use of various apparatus used in psychology.</li> <li>2. The students will be aware about Psychological Experiments and Testing.</li> <li>3. The students will gain practical knowledge about the administration of Psychological tests</li> </ol>
MAPSY-201	Cognitive Psychology	<ol style="list-style-type: none"> <li>1. The students will have understanding of human thinking and reasoning for the benefit of individual as well as society</li> <li>2. The students will gain knowledge of major concepts, theoretical perspectives and empirical findings in cognitive psychology</li> <li>3. The students will develop insights in the areas of Attention, Perception, Memory and Learning.</li> <li>4. The knowledge will help the students to understand and apply the importance of these cognitive processes in everyday life</li> </ol>
MAPSY-202	Physiological Psychology	<ol style="list-style-type: none"> <li>1. The students will have understanding of different physiological systems involved in behaviour</li> <li>2. The students will gain knowledge about how bio-psychology is relevant in our daily lives</li> <li>3. The students acquire knowledge and understanding of structure and functions of Nervous System</li> <li>4. The students will gain knowledge of research methods of physiological psychology</li> </ol>

MAPSY-203	Experimental Designs in Psychology	<ol style="list-style-type: none"> <li>1. The students will have understanding of the experimental designs in research.</li> <li>2. The students will be able to use various factorial designs</li> <li>3. The students would have knowledge of multiple comparison tests</li> <li>4. The students will be able to employ various statistical techniques for psychological research</li> </ol>
MAPSY-204	Environmental Psychology	<ol style="list-style-type: none"> <li>1. The students will gain knowledge about the key concepts of environmental psychology</li> <li>2. The students would become sensitized to the psychological impact of natural disasters, noise and air pollution</li> <li>3. The students will have understanding of major theories that deal with human-environment relations</li> <li>4. The students will be aware of the impact of physical surroundings on their behaviour</li> </ol>
MAPSY-205	Practical (Cognitive Testing & Computers)	<ol style="list-style-type: none"> <li>1. The students will gain knowledge about the administration of cognitive testing</li> <li>2. The students will be able to use and interpret various tests in psychology</li> <li>3. The students shall be able to understand cognitive assessment tools such as reasoning, problem solving, concept formation and memory etc.</li> </ol>

MAPSY-301	Personality Theories	<ol style="list-style-type: none"> <li>1. The students will have understanding of key personality theories.</li> <li>2. The students will be able to observe and interpret individual differences in behaviour in light of theoretical systems of personality</li> <li>3. The knowledge will acquaint the students with the applications of personality theories in different walks of life</li> <li>4. The students will be able to understand individual differences in behaviour</li> </ol>
MAPSY-302	Psychometrics	<ol style="list-style-type: none"> <li>1. The students will have understanding of meaning and methods of psychological testing</li> <li>2. The knowledge will acquaint the students with the characteristics of standardised tests</li> <li>3. The students will develop knowledge about the psychometric theory and principles of test construction</li> <li>4. The students will be able to apply different measurement techniques</li> </ol>
MAPSY-303(i)	Life Span Development	<ol style="list-style-type: none"> <li>1. The students will have understanding of meaning and methods of psychological testing</li> <li>2. The knowledge will acquaint the students with the characteristics of standardised tests</li> <li>3. The students will develop knowledge about the psychometric theory and principles of test construction</li> <li>4. The students will be able to apply different measurement techniques</li> </ol>

MAPSY-303(ii)	Health Psychology	<ol style="list-style-type: none"> <li>1. The students will have understanding of nature and significance of emerging areas of health psychology</li> <li>2. The students will be aware of the role of social, psychological and behavioural risk factors in health promotion and disease prevention</li> <li>3. The students would gain knowledge about the treatment of issues relating to HIV Aids, Obesity and Substance abuse, interventions for managing stress</li> <li>4. The students will be able to work in the area of health psychology</li> </ol>
MAPSY-303(iii)	Positive psychology	<ol style="list-style-type: none"> <li>1. The students would gain knowledge about the nature of positive psychology</li> <li>2. The knowledge about human virtues and positive emotional states would enable the students to understand the relationship of these concepts with wellbeing and undertake research in this area</li> <li>3. Knowledge about the latent role played by positive cognitive states in boosting well-being would prove an asset to the students in their profession.</li> </ol>
MAPSY-304(i)	Industrial Psychology	<ol style="list-style-type: none"> <li>1. The students would gain knowledge about the concepts and principles of Industrial psychology</li> <li>2. The students will have understanding of major factors that influences the human performance and productivity in industry.</li> <li>3. The students will gain knowledge about the theoretical perspectives of job satisfaction and motivation</li> <li>4. The students would be able to design and analyse Personnel Selection and developmental procedures in Industrial setting.</li> </ol>

MAPSY-304(ii)	Psychopathology	<ol style="list-style-type: none"> <li>1. The students would gain knowledge about the symptomatology of psychological disorders</li> <li>2. The students will have understanding of nature, aetiology and treatment of childhood disorders</li> <li>3. The students will be able to apply various therapies used for treatment of different psychological disorders.</li> </ol>
MAPSY-304(iii)	Intelligence & Creativity	<ol style="list-style-type: none"> <li>1. The students would gain conceptual knowledge of intelligence and creativity</li> <li>2. The students will have understanding theoretical foundations of intelligence</li> <li>3. The students will gain knowledge about the historical perspectives and determinants of intelligence</li> <li>4. The students will be able to understand the relationship between intelligence and creativity</li> </ol>
MAPSY-305	Practicals (Field training, practicals & Computers)	<ol style="list-style-type: none"> <li>1. The students will be able to assess individual personality, wellbeing etc.</li> <li>2. The students shall be able to use various types of tests</li> <li>3. The students will be able to administer tests such as GHQ, EQ etc.</li> </ol>
MAPSY-401	Personality Assessment	<ol style="list-style-type: none"> <li>1. The students would gain conceptual knowledge of purpose and use of psychological assessment</li> <li>2. The students will develop skill in utilizing various tests in mental health setting</li> <li>3. The students will be able to apply different assessment techniques in practical life</li> <li>4. The students will gain knowledge about the various projective tests of personality</li> </ol>

MAPSY-402	Research Methodology	<ol style="list-style-type: none"> <li>1. The students will gain critical understanding of qualitative research methods in psychology</li> <li>2. The students will be able to learn and apply appropriate research methods</li> <li>3. The students will be able to understand &amp; evaluate the significance of psychological research and findings</li> <li>4. The students will have understanding of sampling techniques</li> </ol>
MAPSY-403(i)	Counselling Psychology	<ol style="list-style-type: none"> <li>1. The students will have understanding of historical roots of counselling psychology</li> <li>2. The students will gain knowledge regarding the processes of counselling</li> <li>3. The students will understand the dynamics of various approaches and areas of counselling</li> <li>4. The students will be able to use different counselling skills and techniques for effective counselling treatment and prevention</li> </ol>
MAPSY-403(ii)	Psychology of Criminal Behaviour	<ol style="list-style-type: none"> <li>1. The students would be able to explain the various perspectives of Criminal Psychology.</li> <li>2. The knowledge helps the student to work in diverse areas in which forensic psychologists might work</li> <li>3. The students will have understanding of theory and practice of criminal psychology</li> <li>4. The students will be able to use various psychological Measures in correction of crime</li> </ol>

MAPSY-403(iii)	Sports Psychology	<ol style="list-style-type: none"> <li>1. The students would understand the role of personality and motivation in sports</li> <li>2. The students will gain knowledge regarding the role of training and other psychological interventions towards performance enhancement in sports</li> <li>3. The students will understand the role of sport psychologist</li> <li>4. The students will be able to learn and use various stress management techniques</li> </ol>
MAPSY-404(i)	Media Psychology	<ol style="list-style-type: none"> <li>1. The students will apply the media psychology theories while dealing with media audience and while planning different campaigns</li> <li>2. The students will be able to promote positive views of media for the betterment of society</li> </ol>
MAPSY-404(ii)	Organizational Behaviour	<ol style="list-style-type: none"> <li>1. The students will gain knowledge of perspectives to organizational psychology and managerial assumptions about human nature.</li> <li>2. The students will learn and use different techniques and strategies in Organizational Growth and Development</li> <li>3. The students will be able to implement techniques to deal the organization effectively</li> <li>4. The students will have understanding of the researches and applications of organizational psychology.</li> </ol>
MAPSY-404(iii)	Clinical Psychology	<ol style="list-style-type: none"> <li>1. The students will gain knowledge about history taking and mental status examination</li> <li>2. The students will be able to use psychotherapies in practice.</li> <li>3. The students will develop understanding of various clinical disorders.</li> <li>4. The students will understand the criteria of abnormal behaviour</li> </ol>

MAPSY-404(iv)	Behavioural Economics	<ol style="list-style-type: none"> <li>1. The students will gain knowledge of fundamental principles of Behavioural economics</li> <li>2. The students will better analyse economic transactions from the angle of Psychology</li> <li>3. The students will have understanding of the concepts like decision making and mental accounting</li> </ol>
MAPSY-405	Practicals (Personality and ability testing & Computers)	<ol style="list-style-type: none"> <li>1. The students will be able to do psychometric testing</li> <li>2. The students will gain knowledge about personality and ability testing</li> <li>3. The students will practically able to administrate psychological tests</li> </ol>

## **DEPARTMENT OF ZOOLOGY**

### **SESSION 2019-20**

**Program Educational Objectives (PEO)**  
**Program Name-BSc (Honours) Zoology**  
**Program Code-BSHZOO**

#### **The Program objectives are**

**PEO 1.**To elevate thorough knowledge about animal classification and evolutionary relationships of major groups of animals.

**PEO 2.**To develop critical thinking about the organization, complexity and characteristic features of different animal groups.

**PEO 3.**To understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology.

**PEO 4.**To develop proficiency in various application of current aspects of molecular biology, Recombinant DNA technology, biotechniques and genetics.

**PEO 5.**To inculcate the interest among the students about the socio-economic challenges related to animal sciences and develop a foundation for further studies in Zoology.

**PEO 6.** To empower the students with practical skills related to lab-work as well as field-

based studies in life sciences.

**PEO 7.** To upgrade skills related to biological science and to provide competitive edge in securing a career in academia, industry, pharmaceutical research and development in private as well as public sectors.

### **Program Outcomes for Undergraduate Program**

**Program Name-BSc (Honours) Zoology**

**Program Code-BSHZOO**

After successfully completing BSc (Honours) Zoology Program, students should be able to

**PO 1.** have in depth knowledge and understanding about the fundamental concepts, principles and processes underlying the academic field of Zoology and its different subfields.

**PO 2.** appreciate the complexity of life processes, their molecular, cellular and physiological processes, their genetics, evolution and behaviour and their interrelationships with the environment.

**PO 3.** develop technical and analytical skills in modern biological research.

**PO 4.** acquire knowledge that creates different types of professionals in the field of zoology and related fields such as apiculture, aquarium fish keeping, and medical diagnostics.

**PO 5.** prepare students to undertake careers in Biological Science.

**PO 6.** develops empathy and love towards the animals.

### **Program Specific Outcomes (PSO)**

**Program Name-BSc (Honours) Zoology**

**Program Code-BSHZOO**

**PSO 1.** To identify, classify and differentiate diversity of chordates and nonchordates based on their morphological and anatomical organization and to understand their evolutionary relationship.

**PSO 2.** To understand the basic concepts and applications of molecular biology, genomics, taxonomy, physiology, ecology and applied Zoology.

**PSO 3.** To acquire knowledge about research methodologies, scientific and technical writing and skills of problem-solving methods.

**PSO 4.** To understand the applications of biological sciences in apiculture and aquaculture and implement them practically in field.

**PSO 5.** To illustrate the distribution of different traits among population and their inheritance.

**PSO 6.** To describe economic, ecological and medical significance of various animals in human life.

**Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
BZ (H) CC101	Non Chordates I: Protists to Pseudocoelomates	<ul style="list-style-type: none"> <li>• Develop understanding on the diversity of life</li> <li>• Ability to understand the major characteristics of Phylum Protista to Nematoda their diversity classification and importance</li> </ul>
BZ(H) CC 102	Principles of Ecology	Understanding of ecology at organism, population and community levels, various biotic and abiotic interactions , and basic skills for ecological investigation .
BZ (H) CC 201	Non Chordates II:Coelomates	Ability to understand the major characteristics of Coelomates (Phylum Echinodermata )Annelida their diversity ,classification and importance
BZ (H) CC 202	Cell Biology	Understanding of cell structure and function, functioning of signal transduction pathways and process of cell division and cell cycle . Able to demonstrate knowledge of the tools and methods needed to study structure of cell.
BZ (H) CC 301	Diversity of Chordata	Ability to understand the major characteristics of Chordates , origin, their diversity ,classification and importance
BZ (H) CC 302	Animal Physiology : Controlling and Coordinating Systems	<ul style="list-style-type: none"> <li>• Ability to understand the different structure and function of various tissues and the physiology of the systems</li> <li>• ( Nervous, Muscle, Sensory and Endocrine) which control and coordinate the organism</li> </ul>

		<ul style="list-style-type: none"> <li>• Understand the organization of nervous system and process of nerve conduction.</li> <li>• Understand the process of vision and hearing</li> <li>• Understand the process of muscle contraction.</li> </ul>
BZ (H) CC 303	Fundamentals of Biochemistry	Ability to understand the structure and working mechanism of biomolecules responsible for life.
BZ (H) CC 401	Comparative Anatomy of Vertebrates	Ability to understand and compare the anatomy of Vertebrates with respect to Functional and evolutionary significance .
BZ (H) CC 402	Animal Physiology : Life sustaining Systems	<p>Ability to understand the:</p> <ul style="list-style-type: none"> <li>• physiology of life sustaining systems : Digestion, Respiration, Renal, Blood and Circulation and Thermoregulation.</li> <li>• how mammalian body gets nutrition from different biomolecules.</li> <li>• Understand the mechanism and regulation of breathing, oxygen consumption and determination of respiratory quotient.</li> <li>• process of excretion.</li> <li>• Composition of blood and the process of blood circulation</li> </ul>
BZ (H) CC 403	Biochemistry of Metabolic Processes	Ability to understand the metabolism of Carbohydrates, Proteins, Lipids, Purines and Pyrimidines ; Role of Vitamins; Integration of metabolic pathways and their regulatory mechanisms
ZOO (H) CC : 111	Fundamentals of Molecular Biology	Ability to understand the principles of molecular biology and recombinant DNA Technology and to get practical skills in DNA isolation, amplification and separation
ZOO (H) CC : 112	Principles of Genetics	<p>Acquisition of knowledge of</p> <ul style="list-style-type: none"> <li>• Mendelian and post Mendelian modes of inheritance</li> <li>• Mutation and Mutagens</li> <li>• Transposable Genetic elements</li> <li>• Recombination in Bacteria and Viruses</li> <li>• ability to demonstrate Pedigree analysis</li> <li>• Interpretation of Karyotypes and construction of Linkage Maps</li> </ul>
ZOO (H) CC :	Developmental Biology	Ability to understand the:

113		<ul style="list-style-type: none"> <li>• basic concepts of development: embryonic and postembryonic development</li> <li>• Explain and contrast the processes of spermatogenesis, oogenesis.</li> <li>• hormonal control of reproduction in males and female and how this is regulated</li> <li>• implication of teratogens and to identify their effects</li> </ul>
ZOO (H) CC: 114	Evolutionary Biology	<ul style="list-style-type: none"> <li>• Acquisition of in-depth knowledge on the diversity and relationships in animal world.</li> <li>• Ability to understand origin and evolution of Universe and Life</li> <li>• Understanding on the process and theories in evolutionary biology</li> <li>• Understanding of basic concepts of Population Genetics Phylogenetic trees and their interpretation</li> </ul>
ZOO ( DSE) 301	Fundamentals of Entomology	<p>Ability to</p> <ul style="list-style-type: none"> <li>• have in depth knowledge of general morphology, anatomy and physiology of an insect</li> <li>• apply the knowledge to identify the major economically important insects.</li> <li>• Understand the social organisation of insects</li> </ul>
ZOO (DSE)302	Immunology	Understanding of human immune system, its disorders and the basic immunological techniques.
ZOO ( DSE) 303	Research methodology	<p>Ability to</p> <ul style="list-style-type: none"> <li>• Understand research process, research methodologies, and foundational research theories and protocols.</li> <li>• identify a study topic, formulate inquiry questions, organize a literature review, and select appropriate research designs and methodologies.</li> <li>• write a research proposal that includes an introduction, problem statement (significance of study), literature review, methods section, references, and a project</li> </ul>

		timeline.
ZOO (DSE)304	Parasitology	<ul style="list-style-type: none"> <li>•Able to identify the human and Veterinary parasites and the stages of their life cycle, prevalence and pathogenicity</li> </ul>
ZOO (DSE) 305	Wild Life Conservation	<p>Ability to understand</p> <ul style="list-style-type: none"> <li>• how animals interact with each other and their natural environment</li> <li>• Major wildlife of India and the endangered species</li> <li>• Techniques followed in field of wildlife conservation</li> <li>• Develop the ability to use the fundamental principles of wildlife ecology to solve local, regional and national conservation and management issues through understanding of major wild life projects</li> </ul>
ZOO (DSE) 306	Economic Entomology and Pest Management	<ul style="list-style-type: none"> <li>• Students will gain an understanding of</li> <li>• the impacts of arthropods of economic importance particularly in agriculture</li> <li>• tactics and strategies employed in the management of pest species</li> <li>• utilization of beneficial species for commercial use</li> </ul>
ZOO (DSE) 307	Fish and Fisheries	<p>The course is designed to make the student able to</p> <p>Ability to</p> <ul style="list-style-type: none"> <li>• identify the fish on the basis of general morphology</li> <li>• understand the Fish preservation</li> <li>• identify the Fish diseases- Bacterial, viral and parasitic</li> <li>• understand the challenges of aquaculture</li> </ul>
ZOO(DSE)308	Animal Biotechnology	<p>Ability to understand</p> <ul style="list-style-type: none"> <li>• Animal Cell culture methods</li> <li>• fundamental molecular tools and their applications of DNA modification and cloning</li> <li>• transgenic animals and their importance</li> </ul>
ZOO (DSE) 309	Animal Behaviour and	Ability to understand

	chronobiology	<ul style="list-style-type: none"> <li>• historical foundations of the field, current theories and major concepts for a broad range of behavioural topics.</li> <li>• how animals learn and communicate with each other</li> <li>• how they find food, avoid predators, choose their mates, and rear their offspring.</li> </ul>
ZOO GE 01	Animal Diversity	Acquisition of knowledge of diversity of Non Chordates and Chordates , their general features and importance.
ZOO GE 04	Insect Vectors and diseases	<ul style="list-style-type: none"> <li>• understanding of various insect vectors and the diseases caused by them.</li> <li>• Able to apply the acquired knowledge in preventive measures and control of the disease</li> </ul>
ZOO GE 02	Human Physiology	Ability to understand the physiology of different coordinating and life sustaining systems
ZOO GE 03	Food Nutrition and Health	<ul style="list-style-type: none"> <li>• Ability to understand the relationship between food, nutrition and health</li> <li>• Ability to know the major food and water borne and lifestyle diseases.</li> </ul>
ZOO (SEC ) 101	Apiculture	<ul style="list-style-type: none"> <li>• practical identification of honey bee species, equipments , diseases</li> <li>• knowledge of commercially important honey bee products.</li> <li>• setting up and maintenance of an apiary get self employed.</li> </ul>
ZOO (SEC ) 102	Aquarium Fish keeping	<p>Ability to</p> <ul style="list-style-type: none"> <li>• Get knowledge of exotic and endemic aquarium fish</li> <li>• Biology of aquarium fish</li> <li>• Get skill of Budgeting, Construction and Maintenance of Aquarium and transportation of fish</li> <li>• Set up aquarium fish keeping as cottage industry</li> </ul>
ZOO (SEC ) 103	Biotechniques	<p>Ability to know the</p> <ul style="list-style-type: none"> <li>• General safety measures to be followed</li> </ul>

		<p>in labs</p> <ul style="list-style-type: none"> <li>principles and acquire skill in techniques of spectrophotometry, Chromatography, Electrophoresis, Microtomy</li> </ul>
ZOO (SEC ) 104	Medical Diagnostics	<p>Aquisition of</p> <ul style="list-style-type: none"> <li>Skill in laboratory diagnostic methods ( Blood and Urine),</li> <li>Skill in Sterilisation techniques</li> <li>knowledge of lab safety rules</li> <li>Understanding of Infectious and Non Infectious Diseases</li> </ul>
ZOO (SEC ) 105	Vermicompost Technology	<p>Aquisition of skill of setting up vermicompost units at domestic level or commercial level.</p>

### **Programme Name :MSc Zoology**

#### **Program Educational Objectives (PEO)**

**Program Name-MSc Zoology**

**Program Code-MSZOO**

#### **The Program objectives are**

**PEO 1.**To understand the value of fauna and its relevance to the society and our environment.

**PEO 2.**To endow the practical skills of basic and applied zoology like immunology, physiology, entomology and genetics.

**PEO 3.**To gain knowledge about research methodologies, effective communication and skills of problem-solving methods.

**PEO 4.**To inculcate the scientific temperament in the students and encourage them to carry out innovative research projects thereby enkindling in them the spirit of knowledge creation.

**PEO 5.**To provide quality education offering skill-based programs and encouraging the students for self-employment in applied branches of Zoology.

#### **Program Outcomes (PO) for Postgraduate Program**

**Program Name-MSc Zoology**

**Program Code-MSZOO**

After successfully completing M.Sc. (Zoology) Program, students should be able

- PO 1.**To understand the complex evolutionary processes and behavioural pattern of various animals.
- PO 2.**To correlate the physiological and biochemical processes of living organisms and apply in diagnosis of various metabolic disorders.
- PO 3.**To analyse the mechanisms involved in biological processes upto the molecular level.
- PO 4.**To understand the environmental conservation processes and its importance, biodiversity and protection of endangered species.
- PO 5.**To design a research problem and to formulate a scientific solution.
- PO 6.**To gain knowledge of Agro based Small Scale industries and can start their own ventures and generating self-employment.

### **Program Specific Outcomes (PSO)**

**Program Name-MSc Zoology**

**Program Code-MSZOO**

**PSO 1.** To recognize and analyse the ecological and evolutionary importance of various animal groups.

**PSO 2.**To understand the concepts, applications and laboratory standards in the areas of Biosystematics and Taxonomy, Metabolism Concept and Regulation, Ecology, Molecular Cell biology, Genetics, Industrial Zoology, Entomology, Parasitology, Fish biology, Immunology and research methodology.

**PSO 3.** To experiment and interpret scientific data using quantitative and qualitative methods and analytical techniques.

**PSO 4.** To demonstrate the ability to use the knowledge of ecological Sciences in identifying and tackling environmental problems and applying appropriate principles and methodologies to solve a wide range of problems.

**PSO 5.** To understand the mechanism behind occurrence of different life-threatening diseases.

**PSO 6.** To equip ourselves to fit for entrepreneur with special attention on Aquaculture, Apiculture, Sericulture and Lac culture.

**PSO 7.** To gain expertise in identifying key factors of wild life management and different techniques of estimating, remote sensing and global positioning of wild life.

**PSO 8.** To understand how cells function, how their activities contribute to animal physiology and behaviour, and how they cooperate during development to create specific structures, organs and tissues.

	<b>Course</b>	<b>Course Outcome</b>
MZ CC 101	Biosystematics and taxonomy	<ul style="list-style-type: none"> <li>• Ability to understand the principles and practice of biosystematics</li> <li>• in depth knowledge on the diversity and relationships existing in the animal world</li> <li>• to develop a holistic appreciation of the phylogeny of animal world</li> <li>• use of different taxonomic tools used in the classification.</li> </ul>
MZ CC 102	Evolutionary Biology	Understanding of <ul style="list-style-type: none"> <li>• evolutionary patterns and relationships ,</li> <li>• Major Extinctions and their causes</li> <li>• concepts of Molecular Evolution.</li> </ul>
MZ CC 103	Metabolism : Concepts and Regulation	Ability to understand <ul style="list-style-type: none"> <li>• the metabolic pathways and their linkage</li> <li>• metabolism of primary metabolites monosaccharides, lipids, amino acids</li> <li>• the mechanism of enzyme action.</li> </ul>
MZ CC 104	Molecular Cell Biology	Ability to understand <ul style="list-style-type: none"> <li>• the transport across cell membrane</li> <li>• cell motility and energetics,</li> <li>• mechanism and regulation of cell cycle and the regulatory mechanisms of the cell</li> </ul>
MZ IDC 105A	General microbiology	Ability to <ul style="list-style-type: none"> <li>• acquire knowledge of diversity of microorganisms</li> <li>• know the cell structure and function</li> <li>• understand the microbial growth and</li> </ul>

		<p>metabolism</p> <ul style="list-style-type: none"> <li>• demonstrate practical skills in fundamental microbiological techniques.</li> </ul>
MZ CC : 105	Genetics and Cytogenetics	<p>Ability to understand</p> <ul style="list-style-type: none"> <li>• Mendelaian and post Mendalian modes of inheritance</li> <li>• Mutagens and their effects</li> <li>• Genetic analysis ,</li> <li>• The Interpretation of pathology of human chromosome</li> <li>• cause and effect of chromosome abnormalities and associated human diseases.</li> </ul>
MZ CC : 106	Fundamentals of Molecular Biology	<p>Ability to</p> <ul style="list-style-type: none"> <li>• understand the principles of molecular biology and recombinant DNA Technology</li> <li>• get practical skills in DNA isolation, amplification and separation</li> </ul>
MZ CC : 107	Comparative animal physiology	<p>Ability to understand</p> <ul style="list-style-type: none"> <li>• the basic physical and chemical principles underlying the physiological processes</li> <li>• Understand the relative position of individual organs and associated structures and to understand the similarity in similar physiological mechanisms in very diverse organism</li> <li>• how animals adapt physiologically to the environment changes.</li> </ul>
MZ CC : 108	Developmental Biology	<p>Ability to understand</p> <ul style="list-style-type: none"> <li>• cell signalling underlying the development process</li> <li>• Axis and pattern formation in development</li> <li>• Environment cues in development</li> <li>• Development teratogens and their effects</li> </ul>
MZ IDC : 110 B	Biostatistics	<p>Ability to understand and apply fundamental quantitative skills and statistical analysis so as to properly interpret published research and apply such skills in their own research</p>
MZ CC:301	Immunology	<p>The students will be able to:</p> <ul style="list-style-type: none"> <li>• compare and contrast the humoral versus cell-mediated immune responses.</li> </ul>

		<ul style="list-style-type: none"> <li>critically review the role of cytokines in immunity and immune cell activation and be able to identify and characterize cytokines of particular immune importance.</li> <li>clearly state the role of the immune system against different pathogens.</li> <li>be able to distinguish various cell types involved in immune responses and associated functions.</li> <li>gain knowledge about immunologic processes governing graft rejection and therapeutic modalities for immune suppression in transplantation.</li> </ul>
MZ CC:302	Research Methodology and Biotechniques	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>know the basic concept of research and research design.</li> <li>identify the overall process of designing a research study from its inception to its report.</li> <li>distinguish a purpose statement, a research question or hypothesis, and a research objective.</li> <li>familiar with ethical issues in educational research, including those issues that arise in using quantitative and qualitative research.</li> <li>discuss the instrumentation, principle and applications of bioinstruments.</li> <li>demonstrate knowledge and practical skills of using instruments in biology and medical field.</li> </ul>
MZ(En)303 A	Insect morphology and classification	The students would be able to sight identify most of the orders of Insecta. They will also know the basic morphological characters and their modifications in different orders and different habitats. They would also learn the latest ideas of comparing these insects in an evolutionary perspective.
MZ(En)304 A	Insect Anatomy and Physiology	The students would be able to compare functioning of physiological systems in different orders of insects, Communicate (through speech and writing) understanding of principles of insect physiology, Develop a sense of how physiology can infuse into major topics in entomology, such as integrated pest management, crop development and food security, disease transmission, etc.
MZ(C) 303B	Genome and	The student should be able to design and

	Genomics	comprehend experimental strategies for whole genome, transcriptome and proteome analysis
MZ(C)304B	Principles of Gene Manipulation	The learner will be able to get knowledge and understanding of the rapidly changing field of modern biology and fast evolving tools for whole genome analysis, high throughput genome. They will be able to deduce functional relationships at all macromolecular levels i.e. DNA, RNA and proteins across animal kingdom
MZ(P)303C	Vector Biology	Students will be able to: <ul style="list-style-type: none"> <li>• Describe individual components of vector-borne disease transmission using specific examples.</li> <li>• Explain the ecological components of arthropod-borne disease transmission.</li> <li>• Describe and evaluate vector-borne pathogen control measures.</li> </ul>
MZ(P)304C	Parasitology (Protozoans and Helminthes)	Students will have the knowledge and skills: <ul style="list-style-type: none"> <li>• To differentiate the most common protozoan, trematode and cestode parasites.</li> <li>• To describe the main life cycle stages in different parasites.</li> <li>• To learn the morphology of parasites and can explain the nutrition and the movement in parasites.</li> <li>• To understand the pathogenesis of various protozoan and helminth parasitic diseases and can discuss the different prophylactic and therapeutic approaches for the control of these infections.</li> </ul>
MZ(F)303D	Fish Taxonomy and Morphology	acquaint the student with definition, basic concept and importance of morphology and taxonomy. The learner will be able to know different taxonomic procedure including taxonomic collection, preservation, method of identification and taxonomic keys.
MZ(F)304D	Fish Evolution and Functional Anatomy	The aim of this paper to acquaint the student with definition, basic concept and importance of Theory of Origin, diversity and distribution- origin and evolution of major groups of fishes, evolutionary strategies and morphological innovations, gene and genome duplication, this paper also deal with physiology of fish, Growth and metabolism
MZ(E)305A	Principles of	Students will be able to

	Ecology	<ul style="list-style-type: none"> <li>• learn the fundamental aspects of ecology.</li> <li>• understand the impact of anthropogenic activities on the environment.</li> <li>• gain a familiarity with patterns of geographic distribution of organisms, and to apply process theories, such as those involved in species and community ecology, dispersal, and island biogeography to explain those patterns.</li> <li>• Know about the natural resources, current issues in biodiversity and its conservation.</li> </ul>
MZ(E)305B	Limnology	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Analyse and evaluate abiotic and biotic conditions in aquatic systems.</li> <li>• Account for structure and dynamics in biogeochemical cycles and organism communities.</li> <li>• Carry out basic sampling and analyses in freshwater field/laboratory systems.</li> <li>• Plan and carry out experiment/field studies.</li> </ul>
MZ(E)305C	Environment analysis and Management	The students would be well equipped with various environmental assessing and biomonitoring techniques which they may incorporate in their research objectives
MZCC:401	Endocrinology and Neural Physiology	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Describe the structure and function of the major endocrine, reproductive organs and nervous system.</li> <li>• Identify the physiological abnormalities and pathological changes that occur in endocrine and reproductive disorders and use them to interpret clinical features.</li> <li>• Understand the physiology of nervous and sensory system.</li> </ul>
MZCC:402	Animal Behaviour and Wildlife & its management	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Recognize and understand basic terms and concepts of animal behaviour</li> <li>• Identify and discuss methods to explore proximate and ultimate explanations for behaviour.</li> </ul>

		<ul style="list-style-type: none"> <li>• Describe how genetic differences among individuals and species and in the environments in which they develop could interact to produce differences in behaviour</li> <li>• Discuss the role of hormones and the nervous system in recognizing, responding to, and modulating behaviour.</li> <li>• Describe the variation in behaviour observed for different animals, including communication, learning and memory, foraging, predator defence, migration and dispersal, habitat selection and territoriality, mating and reproduction, parental care, and social systems.</li> </ul>
MZ(En)403 A	Insect Pest Control and Toxicology	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Create the awareness about adverse effects of insecticides on the environment and need for environment friendly approach for management of insect pests.</li> <li>• Gain knowledge about the concepts and tools of pest management.</li> <li>• Understand the planning of agricultural ecosystem, tolerance of pest damage, timing of different pest control tactics to manage the pest population effectively.</li> <li>• Learn about the use of different pest control techniques in a harmonious manner.</li> <li>• Understand the role of IPM in sustainable agriculture as the future of modern plant protection and pest control strategy.</li> </ul>
MZ(En)404 A	Agricultural and Medical Entomology	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• Identify major insect pests of various crops in India</li> <li>• Identify various insects responsible for spreading diseases</li> </ul> <p>Can assess and propose control and management strategies for major insect vectors</p>
MZ(C) 403B	Human and Medical Genetics	<p>Ability to have</p> <ul style="list-style-type: none"> <li>• understanding of the rapidly growing genetic diseases with changing environment and role of modern biology and fast evolving tools for whole genome analysis, high throughput genome.</li> <li>• understanding of diagnosis, causes and</li> </ul>

		effects of these diseases at genetic and molecular level.
MZ(C)404B	Cell Division, Differentiation and Cellular Interactions	<p>Students will have knowledge of</p> <ul style="list-style-type: none"> <li>• how the cell cycle is regulated.</li> <li>• how the process of differentiation play role in development of organisms.</li> <li>• various cellular interactions of organisms with their internal genetic environment and how these interactions are affected by external environment.</li> </ul>
MZ(P)403C	Host Parasite Relationship	<p>The students should be able:</p> <ul style="list-style-type: none"> <li>• To explain the host -parasite relationship.</li> <li>• To learn the different host and vector types.</li> <li>• To describe the localization sides of parasites in their hosts.</li> <li>• To review various vaccines against parasitic diseases.</li> </ul>
MZ(P)404C	Parasitology (Plant nematodes and Zoonosis)	<p>Students will have the knowledge and skills:</p> <ul style="list-style-type: none"> <li>• To know the different nematodes of crop plants.</li> <li>• To explain the different techniques for the management of nematodes.</li> <li>• To describe the term zoonoses and knows the main zoonotic parasites among protozoa and metazoa.</li> <li>• To understand the epidemiology, transmission and clinical manifestations of various zoonotic diseases.</li> </ul>
MZ(F)403D	Aquatic Resources and their Conservation	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• get acquaint with the aquatic resources, biology of important cold-water fishes of India.</li> <li>• Know the importance and methods of conservation of Riverine fisheries cold water fisheries, marine fisheries. Lacustrine fisheries.</li> </ul>
MZ(F)404 D	Aquaculture	<p>students will be able to</p> <ul style="list-style-type: none"> <li>• critically evaluate the factors which are important for a sustainable growth in aquaculture industry</li> <li>• to deal with Selection of site for a fish farm, Ponds of a fish farm, Design and Construction and its maintenance</li> </ul>

MZ(E)405A	Industrial Zoology	The students will be well acquainted with industrially important animals, their cultures, applications, would prepare themselves for small startups.
MZ (E) 406	Credit Seminar	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• acquire depth of knowledge of the contemporary topics in interdisciplinary field of science,</li> <li>• learn to develop persuasive speech, present information in a compelling, well-structured, and logical sequence,</li> <li>• respond respectfully to opposing ideas,</li> <li>• show and develop their ability to synthesize, evaluate and reflect on information.</li> </ul>
MZ(E)405B	Dissertation	<p>students will be able to;</p> <ul style="list-style-type: none"> <li>• design and manage a piece of original project work</li> <li>• develop a research proposal and protocol</li> <li>• discuss the ethical dimensions of their research and obtain appropriate ethical approval if needed</li> <li>• synthesise knowledge and skills previously gained and applied to an in-depth study</li> <li>• establish links between theory and methods within their field of study</li> <li>• select from different methodologies, methods and forms of analysis to produce a suitable research design, and justify their design</li> <li>• present the findings of their project in a written report</li> </ul>

## **Program Educational Objectives (PEO)**

**Program Name: - MASTER OF MUSIC**

**Program Code:- MAMUS-101**

The program aims are

- **PEO 1.**To make the students well known about the development of Indian music in ancient to modern period and also about the proper study of gharanas.
- **PEO 2.**The students will be able to know about the eminent music scholars and musicians.
- **PEO 3.**The students will be able know about the various shellies of Hindustani music and study about the important Granths of Indian music.
- **PEO 4.**The students will have the stage performance of various ragas in diferrent gayan shellies like Khayal,Dhrupad,Dhamar etc.
- **PEO 5.**The students will be able to learn about the comparative study of Hindustani and Karnataka styles of music.

## **Program Outcomes (PO)**

**Program Name: - MASTER OF ARTS (MUSIC VOCAL)**

**Program Code:- MAMUS-101**

After completing undergraduate program in Music Vocal & Gurmat Sangeet, a student will be able to: -

1. **PO 1.**Have further study of music.
2. **PO 2.**Will have the eligibility to understand the classical Raga gayan system.
3. **PO 3.**The students will be able to learn the shastriya Sangeet in future.
4. **PO 4.**The study will complete the basic need and students can make their in future in this field.
5. **PO 5.** The students will be able to learn about the technical and scientific terms and scales of music and essential aspects of music like voice culture.
6. **PO 6.**The students will have the enrichment of raga elements and to define the notation system.
7. The students will be able know about the various shellies of Hindustani music and study about the important granths of Indian music.

## **Program Specific Outcomes (PSO)**

**Program Name: - MASTER OF MUSIC**

**Program Code:- MAMUS-101**

- **PSO 1.**To make the ability of students to study the gharana tradition in Punjab and to know about the eminent musicians who are the Indian classical music legends.
- **PSO 2.** Performance in ragas in khayal Gayaki and dhrupad will enhance the quality of the students.
- **PSO 3.** To enable the students will be to make their future in various Musical fields.
- **PSO 4.** To equip the students about the relative study of Music with other fields.
- **PSO 5.** To make the students to perform with their creativity in Music.
- **PSO 6.** To increase the Confidence level in Performing Art in Music.
- **PSO 7.** To impart the quality of Listening the Best music forms.
- **PSO 8.** To make the ability of various forms in Classical Music.

## Course Outcome:

Course Code	Course	Course Outcome
MV	MA 1 <sup>st</sup> sem	<ul style="list-style-type: none"><li>• The students will be able to learn about the technical and scientific terms and scales of music and essential aspects of music like voice culture.</li><li>• The students will be able to study the different terms of practical music like avaroh-avaroh,kan,murki etc.</li><li>• To make the students well known about the development of Indian music in ancient to modern period and also about the proper study of gharanas.</li><li>• The students will be able to know about the eminent music scholars and musicians.</li><li>• The ability to give the information of talas on hands as well as on tabla.</li></ul>
MV	MA 2 <sup>nd</sup> sem	<ul style="list-style-type: none"><li>• The detailed study of swaras,gramas and technical terms of music will be defined by students.</li><li>• The students will be able to learn about the comparative study of Hindustani and Karnataka styles of music.</li><li>• The student will be introduced to the cycle in the context of swara-samvada in Indian music.</li><li>• The students will be interduced to the development of Indian music in different periods and contribution of Sikh Gurus.</li><li>• The historical development of difeerent gayan shellies and khayal gharanas will be introduced to the students.</li></ul>

<b>MV</b>	<b>MA 3<sup>rd</sup> sem</b>	<ul style="list-style-type: none"> <li>• The students will be able to know about theaesthetical study of indain classical music.</li> <li>• The students will be well known about thetraditional system of teaching music.</li> <li>• The students will be able to learn about different ragas and talas and their physics and aesthetical concepts.</li> <li>• The performance will be given by students with various gayan shellies of ragas and other practical manners.</li> <li>• The students will be able to know about the classical singing styles of Guru Granth Sahib.</li> </ul>
<b>MV</b>	<b>MA 4<sup>th</sup> sem</b>	<ul style="list-style-type: none"> <li>• The students will be able to know about the aesthetical theories of western scholars with respect to music.</li> <li>• The students will be able to know about the Rasa concept and relation of music with religion.</li> <li>• The students will be able to learn about the folk forms of music in Shri Guru Granth Sahib.</li> <li>• The students will know about the raga classification and raga dhyan values in Indian classical music.</li> <li>• The students will be able to know about the various table ghranas and will be able to perform with various gayan shellies of Indian classical music.</li> </ul>

## **Program Name: Bachelor of Arts**

### **Program Code: BA**

#### **Program Educational Objectives (PEO)**

**PEO 1.** To enhance the knowledge base and inculcate right attitude about the society.

**PEO 2.** To develop socio-cultural imagination and creativity skills in the students.

**PEO 3.** Enable students to think critically and rationally about social issues and society with in the arena of history, polity, religion, literature etc.

**PEO 4.** To encourages a commitment to social justice and awareness towards social inequality through coursework, assignments, independent studies and research.

**PEO 5.** Develop basic and advanced theoretical as well as methodological knowledge for application in real world.

**PEO 6.** To develop necessary communication, interpersonal, research, teamwork and leadership skills so as to able to take up various responsibilities in social world.

#### **Program Outcomes (PO) for Under Graduate Course**

**PO 1.** The students acquire knowledge in the field of social sciences, literature, arts and humanities that make them insightful, sensitive and sensible.

**PO 2.** .The program enables the students to attain knowledge with human values framing the base to deal with various problems in life with courage and humanity.

**PO 3.** The program enables the students the get the sense of Social Service.

**PO 4.** Program provides the base to be the responsible citizen.

**PO 5.** Develop a foundation for pursuing higher education in the field of arts and humanities or to attain jobs.

### **Program Specific Outcomes (PSO)**

**PSO 1.** To make students understand the real life situation with the ability to apply social sciences concepts and theories to the real world and ultimately their everyday lives.

**PSO 2.** The students shall incorporate the better understanding of various dimensions of the Indian society based on literature, history, religion, languages etc.

**PSO 3.** The students shall be able to understand the flow of change in the society and enables them to adapt to the situations accordingly.

**PSO 4.** The Students of arts have to work beyond the classroom boundary at the time of field study activities. As a result, communication and research skills develop in the students.

**PSO 5.** To make the students to sensitize regarding social service and social responsibility, so that they can contribute towards betterment of society.

**PSO 6.** The students shall be able to understand the society and social issues from global prospective.

### **COURSE OUTCOMES (CO)**

**Course Name :- Sociology**

**Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
BA-113	Fundamentals of Sociology I	<ol style="list-style-type: none"><li>1. The students shall be able to understand the society, community, associations and other basic concepts of the subject.</li><li>2. Enable students to see and compare sociology with other social sciences.</li><li>3. It will make the students aware about nature and composition of society, culture and cultural values, civilization and process of socialization.</li></ol>
BA-213	Fundamentals of Sociology II	<ol style="list-style-type: none"><li>1. This course shall be able to make clear the various social processes taking place in the society.</li><li>2. The students shall be able to understand development of the individuals in the society.</li><li>3. It will also discuss nature and concept of various social institutions, social control and deviance, thus enable students to make balance in life.</li></ol>
BA-313	Social Structure in India	<ol style="list-style-type: none"><li>1. This course will enable the students to understand the various dimensions of Indian society.</li><li>2. The students shall be able to understand the differentiation in Indian society based on different strata like caste and class.</li><li>3. It also focuses upon the important aspect of gender differentiation.</li><li>4. This course will enable the students to compares the tribal, urban and rural organizations of Indian society.</li></ol>

BA-413	Social Change and Problems in India	<ol style="list-style-type: none"> <li>1. This course will explore the reasons, process and effects of social change.</li> <li>2. The students shall be able to understand the flow of change in the society and enables them to adapt to the situations accordingly.</li> <li>3. It will also discuss the various social problems.</li> <li>4. Make the students aware about the surroundings.</li> <li>5. This course shall be useful for students in Competitive exams.</li> </ol>
BA-513	Social Thought	<ol style="list-style-type: none"> <li>1. This course will help the students to understand the various concepts of society from the prominent sociologist's point of view.</li> <li>2. This course will discuss the various thoughts and ideas to explore the society better.</li> <li>3. The students shall be able to understand the worldview in respect to various concepts of the society.</li> </ol>
BA-613	Research Methodology	<ol style="list-style-type: none"> <li>1. This course will discuss the process and methods of social research.</li> <li>2. It will enable the students to see specific social phenomenon from researcher perspective, thus helpful in finding and comparing social facts.</li> <li>3. The students shall be able to understand the methods of field surveys and report writing.</li> <li>4. This course shall be useful for students in Competitive exams.</li> <li>5. This course shall be useful for students in their further studies and jobs.</li> </ol>

### Course Name: Hindi Literature

#### Course Outcome:

Course	Course	Course Outcome
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Code		
BA-106	fgUnh lkfgR;	1- fgUnh ds vk/kqfud ;qx ds izeq[k dfo;ksa vkSj muds dkO; dk laf{klr ifjp;A 2- vk/kqfud fgUnh miU;kl ds v/;;u ds }kjk fgUnh miU;kl dh lkekU; tkudkjA 3- fgUnh lkfgR; ds bfrgkl ds izkjfEHkd :i dk ifjp;A 4- ys[ku dyk dks 'kq) vkSj izHkko'kkyh cukus ds fy, O;kdj.k dk O;Ogkfjd KkuA
BA-206	fgUnh lkfgR;	1- fgUnh dh vk/kqfud dgkfu;ksa ds v/;;u ds ek;/e ls izeq[k dgkuhdjkksa dk ifjp;A 2- fgUnh ds ukVd ds v/;;u ds ek;/e ls ukVd ds :i&Lo:i dk ifjp;A 3- fgUnh lkfgR; ds bfrgkl ds e/dky ds izeq[k dfo;ksa vkSj mud izo`fUk;ksa dh tkudkjA 4- Hkk"kk dks vkSj lqUnj cukus ds fy, eqgkojksa vkSj yksdksfDr;ksa dk ifjp;A
BA-306	fgUnh lkfgR;	1 fgUnh ds vk/kqfud dfo;ksa dh dforkvksa ds ek;/e ls bl ;qx ds dfo;ksa vkSj mudh dforkvksa dk lkekU; ifjp;A 2 ukVd ds v/;;u ds ek;/e ls fgUnh ds ukVd dh lekU; tkudkj A 3 fgUnh lkfgR; ds rhljs dky ds izeq[k dfo;ksa vkSj izo`fUk;ksa dk ifjp;A 4 fgUnh Hkk"kk ds fofHkUu :iksa vkSj mlds 'kCn Hk.Mkj ds ifjp; ds lkFk&lkFk bls ekud :i dk O;ogkfjd ifjp;A
BA-406	fgUnh lkfgR;	1- fgUnh miU;kl ds v/;;u ds ek;/e ls miU;kl ds :i&Lo:i dk ifjp;A 2- fgUnh ,dkadh ds v/;;u ds ek;/e ls ,dkadh ds lkekU; :i dh tkudkjA 3- fgUnh lkfgR; ds vk/kqfud dky ds dkO; dh izeq[k izo`fUk;ksa dk ifjp;A 4- dkO;'kkL= ds dsoy vyadkjksa dk lksnkgj.k O;Ogkfjd ifjp;A
BA-506	fgUnh lkfgR;	1- [k.M dkO; ds v/;;u ds e/e ls dfork ds bl :i dk ifjp;A 2- fucU/kksa ds v/;;u ds ek;/e ls bls :i&Lo:i dk ifjp;A 3- dkO;'kkL= ds vUrxZr dfork ds fofHkUu :iksa dk ifjp; ,oe~ 'kCnksa dh 'kfDr;ksa dk ifjp;A 4- dfork esa iz;qDr fofHkUu NUnksa dk ifjp; ,oe~ O;ogkfjd KkuA

BA-606	fgUnh lkfgR;	<ol style="list-style-type: none"> <li>1- Nk;kokn dh izfl) dof;=h egknsdh oekZ ds laLej.kksa ds v/;;u ds ek;/e ls muds x  ds Lo:i dk ifjp;A</li> <li>2- fofHkUu jpukdkjksa dh x  jpukvksa ds ek;/e ls fgUnh ds fofHkUu :iksa dk lkekU; ifjp;A</li> <li>3- fgUnh lkfgR; ds bfrgkl ds vk/kqfud dky dh uohu fo/kkvksa ds fodkl dh tkudkjA</li> <li>4- vk/kqfud ;qx eas fodflr uohu fo/kkvksa ds Lo:i vkSj rUoksa dk ifjp;A</li> </ol>

**Course Name: B.A- Physical Education**

Course Code	Course	Course Outcome
<b>B.A. PART-I, Semester-I ( B.A- 114)</b>	<b>Physical Education –A (Theory)</b>	<ol style="list-style-type: none"> <li>1. To give knowledge about physical education and sports and value in modern society.</li> <li>2. Understand to know about Olympics games.</li> <li>3. The students will study about N.S.N.IS, S.A.I.I.OC. .</li> <li>4. The knowledge will help the students to understand personal hygiene.</li> <li>5. To give knowledge about anatomy and physiology.</li> <li>6. Understand about individual differences.</li> <li>7. To give knowledge about how to growth &amp; development our body.</li> </ol>

<p><b>B.A-114(P)</b></p>	<p><b>PHYSICAL EDUCATION –B (Practical)</b></p>	<p>8. Student will be study about heredity and environment.</p> <p>1. To give knowledge about &amp; how to play hockey, long jump, basket ball and its rule regulation, layout and technique.</p>
<p><b>B.A. PART-I, Semester-II B.A-214</b></p>	<p><b>PHYSICAL EDUCATION – A (Theory)</b></p>	<p>1. Understand about classification of age.</p> <p>2. The students will be able to understand various body types.</p> <p>3. To give knowledge about benefits of warm up &amp;cooling down.</p> <p>4. Understand about fatigue and how to relief fatigue.</p> <p>5. To give knowledge about sports awards.</p> <p>6. Understand about the health and how to improve our health.</p> <p>7. Understand about communicable diseases.</p> <p>8. Knowledge about drugs and side effects of drugs.</p> <p>9. To give knowledge about skeleton system and various types bone of human body.</p> <p>10. To give knowledge about joint system of human body.</p>
<p><b>B.A- 214 (P)</b></p>	<p><b>PHYSICAL EDUCATION-B (Practical)</b></p>	<p>1. To give knowledge about &amp; how to play hockey, long jump, basket ball and its rule regulation, layout and technique.</p>
<p><b>B.A. PART-II, SEMESTER-III B.A-314</b></p>	<p><b>PHYSICAL EDUCATION – A (Theory)</b></p>	<p>1. To give knowledge about Yoga and its benefits and its physiological effect on various body system.</p>

<p><b>B.A- 314 (P)</b></p>	<p><b>PHYSICAL EDUCATION-B (Practical)</b></p>	<ol style="list-style-type: none"> <li>2. To know about the theories of play.</li> <li>3. To give knowledge about growth and development in childhood periods physical,</li> <li>4. Mental, emotional, &amp; social.</li> <li>5. Understand about national and international integration.</li> <li>6. Knowledge about digestive system and its function &amp; parts of digestive system.</li> <li>7. Understanding about socialization and its role of family, school &amp; sports.</li> </ol>
<p><b>B.A. PART-II, SEMESTER-IV B.A- 414</b></p>	<p><b>PHYSICAL EDUCATION – A (Theory)</b></p>	<ol style="list-style-type: none"> <li>1. To give knowledge about and how to play Kabaddi, Shot put and its rule regulation, layout and technique.</li> <li>1. Understand about sports man behavior.</li> <li>2. The students will be able to understand various types of theories of Learning.</li> <li>3. Knowledge about transfer training in sports and its importance.</li> <li>4. Understand about motivation and how to motivate to play games.</li> <li>5. To give knowledge about adolescent period characteristics and problems.</li> <li>6. To give knowledge about muscles and circulatory system.</li> <li>7. Understand about sports injuries and its prevention.</li> <li>8. To give knowledge about first aid and how to give first aid of injured persons.</li> </ol>
<p><b>B.A-414(P)</b></p> <p><b>B.A. PART-III, SEMESTER-V B.A- 514</b></p>	<p><b>PHYSICAL EDUCATION-B (Practical)</b></p> <p><b>PHYSICAL EDUCATION – A (Theory)</b></p>	<ol style="list-style-type: none"> <li>1. To give knowledge about &amp; how to play KHO-KHO, High jump, discus throw and its rule regulation, layout and technique.</li> </ol>



<p><b>B.A -614(P)</b></p>	<p><b>PHYSICAL EDUCATION-B (Practical)</b></p>	<p>qualities and responsibilities of leader.</p> <ol style="list-style-type: none"> <li>3. To give knowledge about balance diet.</li> <li>4. Understand about sports performance &amp; methods of improving Indian sports performance.</li> <li>5. To give knowledge about physical fitness and its components.</li> <li>6. Understand about sports training and various types of training method.</li> <li>7. To give knowledge about blood pressure and technique of measurement.</li> </ol> <p>8. Understand about how to measure physiological terminology such as cardiac output, stroke volume, Oxygen debt, vital capacity, BMI &amp; BMR.</p> <ol style="list-style-type: none"> <li>1. To give knowledge about &amp; how to play badminton and relay races and its rule regulation, layout and technique.</li> </ol>
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**Course Name: Religious Studies**

**Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
BA-108	Indian Religions	<ol style="list-style-type: none"><li>1. The Course provides Knowledge about Vedic and Sharman traditions.</li><li>2. Knowledge about Old Indian Major Religions</li><li>3. Knowledge about faith, believes, practices of Old Indian Religions.</li><li>4. Knowledge about Birth, Initiation and death sacraments of Vedic and Sharman traditions.</li><li>5. Knowledge about the life of founders of Sharman tradition and their practices</li><li>6. To explain why Buddha and Mahavira are unique</li></ol>
BA-208	Sikh Religion	<ol style="list-style-type: none"><li>1. Focus on world's modern religion (Sikhism)</li><li>2. Focus on Guru Nanak Dev Ji's life and his journeys</li><li>3. Focus on the faith, believes and institutions of Sikhism</li><li>4. Introduction about Sri Guru Granth Sahib, Japji, Barahmah Majh</li><li>5. Role of Miri Piri as a mini parliament</li><li>6. Read about the creation of Khalsa</li><li>7. Focus on the Sikh Martyrdom</li></ol>
BA-308	Semitic Religions	<ol style="list-style-type: none"><li>1. Awareness about the characteristics of Prophet.</li><li>2. Awareness about the Old and Modern Major Semitic Religions</li><li>3. Awareness about the life of Prophet Moses, Jesus Christ, Mohammad and Zarathustra</li><li>4. Enriched with the concepts of Ten Commandments, Kingdom of God and five pillars</li><li>5. Be able to give introductory knowledge of Bible, Quran and Zand Avesta</li></ol>
BA-408	Medieval and Modern Religious Movements	<ol style="list-style-type: none"><li>1. To give knowledge about the Bhagti and Sufi Movements in India</li><li>2. To give knowledge of the life of Bhagat Kabir, Ravidas, Namdev and their Concepts</li><li>3. Importance of Bhagti in human life</li><li>4. In Which ways Religious movements are more effective on society</li><li>5. Knowledge about the effects of Hindu religious movements</li></ol>

		<ol style="list-style-type: none"> <li>6. Knowledge about the effects of Sikh religious movements</li> <li>7. Knowledge about the effects of Muslim religious movements</li> </ol>
BA-508	Primitive Religion	<ol style="list-style-type: none"> <li>1. Introduce candidates of primitive religion and its characteristics</li> <li>2. Knowledge about the primitive sacraments</li> <li>3. Knowledge about the forms of religion</li> <li>4. Knowledge about the religion and its role in human life</li> <li>5. Encourage the candidates to reflect on religious responses</li> <li>6. Impact of religion on society</li> </ol>
BA-608	Sikh Religion	<ol style="list-style-type: none"> <li>1. Focus on the Scriptures, faith, believes of Sikhism</li> <li>2. Introductory knowledge of Sikh Scripture (Sri Guru Granth Sahib, Dasam Granth, Bhai Gurdaas First Vaar)</li> <li>3. Knowledge about the role of Sikh Scriptures in human life.</li> <li>4. Knowledge about the contents of Asa di Vaar, Sukhmani, Laavan</li> <li>5. Knowledge about the Sikh Concepts (Hukam, Sachair, Panj Khand)</li> <li>6. Knowledge about the Sikh Institutions (Harmandir, Sarbat Khalsa, Gurmata )</li> </ol>

**Course Name: BA-Information Technology**

**Course Outcome:**

Course Code	Course	Course Outcome
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COMP-1	<b>Computer Fundamental:</b>	<ol style="list-style-type: none"> <li>1. To understand the basics of computer system, its architectureNetworks.</li> <li>2. To understand the basic concepts, terminology of IT and familiar with the use of IT tools.</li> <li>3. To Learn and explore new IT techniques in various applications and to identify the issues related to security.</li> <li>4. To learn basic of word processing ,spreadsheet and presentation.</li> <li>5. To be able to access the Internet, and internet application</li> </ol>
COMP-2:	<b>Computer Programming using C:</b>	<ol style="list-style-type: none"> <li>1. Learn how to draw flowcharts and write algorithm/pseudocode.</li> <li>2. Learn, how to compile and debug programs in C language, use different data types, operators and console I/O function in a computer program.</li> <li>3. Design programs involving decision control statements, loop control statements, case control structures, arrays, strings, pointers, functions and implement the dynamics of memory by the use of pointers</li> </ol>
COMP-3:	<b>Web Designing:</b>	<ol style="list-style-type: none"> <li>1. Implement interactive web page(s) using HTML, CSS and JavaScript.</li> <li>2. Design a responsive web site using HTML5 and CSS3.</li> <li>3. Demonstrate Rich Internet Application.</li> </ol>
COMP-4:	<b>Database Management systems</b>	<ol style="list-style-type: none"> <li>1. To understand the different issues involved in the design and implementation of a database system.</li> <li>2. To study the physical and logical</li> </ol>

		<p>database designs, database modeling, relational, hierarchical, and network models.</p> <p>3. Analyze Database design using E-R data model by identifying entities, attributes, relationships, generalization and specialization along with relational algebra.</p> <p>4. Use data manipulation language to query, update, and manage a database the given real world problem</p> <p>5. Use of SQL and PL/SQL to implementation database applications with usage of DDL aspect of SQL, DML aspect of SQL..</p>
<b>COMP-5</b>	<b>Object Oriented Programming using C++</b>	<p>1. Be able to understand the difference between object oriented programming and procedural oriented language and data types in C++.</p> <p>2. Be able to program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.</p>
<b>COMP-6</b>	<b>PHP Programming:</b>	<p>1. Test and debug a PHP application, Use cookies and sessions, Work with regular expressions, handle exceptions and validate data.</p> <p>2. Build Dynamic web site using server side PHP Programming and Database connectivity.</p> <p>3. Describe and differentiate different Web Extensions and Web Services.</p> <p>4. Demonstrate web application using PHP.</p>

**Course Name : Bachelor of Arts (Fine Arts)**

**B.A. - FINE ARTS**

<b>Course Code</b>	<b>Course (B.A. Fine Arts)</b>	<b>Course Outcome</b>
<b>B.A. 112</b>	History of Indian Art and Aesthetics	<ol style="list-style-type: none"><li>1. Develop the knowledge of techniques and subject matter of the different pre-historic periods. Their valuable contribution for art.</li><li>2. Understand the basic elements of arts : lines color , shape , texture etc. and their role in modern art.</li><li>3. The students will be able to show aesthetical and critical awareness with detail of principles of art six limbs of art.</li></ol>
<b>B.A. 112 (P)</b>	Still life and Alphabet Writing\Design	<ol style="list-style-type: none"><li>1. The course serves to extend the student's awareness of the visual arts mechanism of creativity, precision tools and materials.</li><li>2. The students will be able to skills specific to the art form studied to elaborate an idea , a theme or a composition to a point of realization.</li><li>3. Gain knowledge for further development and the knowledge of design and skills acquired during the studies.</li></ol>
<b>B.A. 212</b>	History of Indian Sculptures	<ol style="list-style-type: none"><li>1. The students will be understand with different styles and development of forms in Indian sculptures as well as temples (stupas) .</li><li>2. Gain knowledge to discuss the special structural abilities and their social and historical significances.</li><li>3. The students will be understand the brief history of rulers and their role to engage with conceptual composition during their eras.</li></ol>
<b>B.A. 212(P)</b>	Still life and Poster	<ol style="list-style-type: none"><li>1. The course serves to study proportion ,volume , texture and light &amp; shades</li><li>2. The students will be understand about materials and methods involved and development of</li></ol>

		<p>creatives ability.</p> <ol style="list-style-type: none"> <li>3. Students will be able to extend their basic understanding of design and making of simple layouts of poster advertisement etc.</li> </ol>
<b>B.A. 312</b>	History of Indian Sculptures	<ol style="list-style-type: none"> <li>1. The students will be able to understand the painting and sculpture in India .</li> <li>2. The emphasis will be to make them aware of different terms , concepts, forms and subject matter of these works.</li> <li>3. They will be able to inculcating mind involvement in the art process by exploration.</li> </ol>
<b>B.A. 312(P)</b>	Landscape\Composition and Head Study	<ol style="list-style-type: none"> <li>1. The course serves to extend the students advanced studies in different shapes , form , life models of different age groups .</li> <li>2. Delineation of the structural character of the head .</li> <li>3. The students will be able study theory of pictorial space including figures and ground the three dimension and the picture field , sub division and grouping of objects figures , interiors etc.</li> </ol>
<b>B.A. 412</b>	History of Indian Miniature Painting	<ol style="list-style-type: none"> <li>1. The students will be able to introduce the various schools, styles and phases of the development .</li> <li>2. Emphasis will be to make aware of the different terms , concept , forms and subject matter of these works .</li> <li>3. The students will be aware of the development of miniature art style during different Indian rulers .</li> </ol>
<b>B.A.412(P)</b>	Landscape\Composition and Head Study	<ol style="list-style-type: none"> <li>1. The students will learn about feature , complexion ,expressions in various medium and structural character of the head</li> <li>2. Extend the students knowledge in different shapes from models of a different age groups.</li> <li>3. The students will be develop knowledge about composition based on human figures, figurative and non figurative elements of nature .</li> </ol>
<b>B.A. 512</b>	History of Indian	<ol style="list-style-type: none"> <li>1. The students will be able to introduced the</li> </ol>

	Painting (Modern Period)	<p>concepts of art ,its relationships basic terms and categories.</p> <ol style="list-style-type: none"> <li>2. The aim is to enable students to engage with visual and conceptual comparisons in arts of different times and places .</li> <li>3. The students will be able to study the modern aspect of art and new concept , subject matter of these works .</li> </ol>
<b>B.A. 512 (P)</b>	Landscape\Composition and Life Study	<ol style="list-style-type: none"> <li>1. Make students aware to advanced study from life models to develop a volume conception , human structure as it relates to form , contour and movement .</li> <li>2. The students will be able to understand distinction features of different age group and different size .</li> <li>3. The entire syllabus is design to understand the process of learning to observe and reproduce the pure designs .</li> </ol>
<b>B.A. 612</b>	History of Modern Movements in Europe and History of Western Art	<ol style="list-style-type: none"> <li>1. The students will be able aware to study the different phases of western art history</li> <li>2. While discussing the development in the field of art ; they will also be informed about the socio-political and religious circumstances which contributed in art .</li> <li>3. The students will learn taking into account the changes in social and technological spheres the emergence of modern art would be discussed.</li> </ol>

## Course Name: History

### Course Outcome:

Course Code	Course	Course Outcome
BA 111	<b>HISTORY OF INDIA UPTO A.D 1000</b>	<ol style="list-style-type: none"><li>1. The students will be able to analyse the culture of India</li><li>2. Understand the contribution of various dynasties to art and literature</li><li>3. The students will be able to critically evaluate the socio-cultural ethos of Indian society</li></ol>
BA 211	<b>HISTORY OF INDIA (A.D 1000 to 1707)</b>	<ol style="list-style-type: none"><li>1. Gain knowledge about the cultural heritage of Medieval India</li><li>2. The students will be able to evaluate the socio religious ethos of Indian Society</li><li>3. The students will understand the advent of Muslim rule in India</li></ol>
BA311	<b>HISTORY OF INDIA (A.D. 1707-1966)</b>	<ol style="list-style-type: none"><li>1. The students will learn about the advent of British rule in India</li><li>2. The students will be able to understand the hard earned freedom</li><li>3. The students will gain knowledge to appreciate and respect national leaders</li></ol>
BA411	<b>HISTORY OF THE PUNJAB (A.D. 1469-1799)</b>	<ol style="list-style-type: none"><li>1. The students will gain knowledge about the rise of Sikh movement</li><li>2. The students will be aware of the contribution of Sikh Gurus in the growth of Sikhism</li><li>3. The students will be develop knowledge about the early resistance against the Mughal rule</li></ol>

<b>BA511</b>	<b>HISTORY OF THE WORLD (A.D. 1500-1950)</b>	<ol style="list-style-type: none"> <li>1. The students will learn about the Renaissance and Reformation of Europe</li> <li>2. Gain knowledge about French Revolution of 1789</li> <li>3. The students will be able to understand main events of the modern world</li> </ol>
<b>BA611</b>	<b>HISTORY OF THE PUNJAB (A.D. 1799-1990)</b>	<ol style="list-style-type: none"> <li>1. The students will gain knowledge about the empire of Maharaja Ranjit Singh</li> <li>2. The students will understand about the British rule in Punjab</li> <li>3. Gain knowledge about the various phases of Freedom Movement</li> </ol>

### **BA (Elective Subject)**

**Objective:** To aware the students about the field of Journalism & Mass Communication and make the competent to enter in the field of media.

**Programme specific Outcomes:** The students will be able to communicate better within the media industry. Students will learn the process and technicalities of collecting information and then shaping it into a proper structured news story. They can opt this subject for higher education.

<b>Class</b>	<b>Course</b>	<b>Outcome</b>
BA I Semester I	Introduction To Communication	<ol style="list-style-type: none"> <li>1. The students will be able to communicate better within the media industry.</li> <li>2. They will also learn to have an effective communication with their audience.</li> </ol>
BA I Semester II	Introduction To Journalism	<ol style="list-style-type: none"> <li>1. The students will have a clear and basic knowledge about the field they are entering into.</li> </ol>
BA II Semester III	Fundamentals of Journalism	<ol style="list-style-type: none"> <li>1. Students will understand the role played by the press</li> </ol>

		<p>in the Indian freedom struggle and the overall national development.</p> <p>2. Students will have an insight of prominent newspapers, journalists and challenges being faced by the Indian Press.</p>
BA II Semester IV	Print Media	<p>1. Students will learn the process and technicalities of collecting information and then shaping it into a proper structured news story.</p> <p>2. They will understand the hierarchy and the role of the individual elements of structure of the newspaper.</p>
BA III Semester V	Photo Journalism	<p>1. The students will be able to click better photographs by understanding the various dynamics of photography.</p> <p>2. The students will be able to judge the news value of a photograph and write a caption or a feature accordingly.</p>
BA III Semester VI	Radio Journalism	<p>1. Students will learn to write scripts and news bulletins for the radio.</p> <p>2. Students will learn the skills of recording and presenting the radio programmes in various formats.</p>

**Course Name: BA English**

## Code: BAENG

### Course Outcome:

Course Code	Course	Course Outcome
BA 103	English Communication Skills	After the completion of the course, the students: 1. Can illustrate and explain the process of communication. 2. Can compose, write and speak complete and meaningful ideas. 3. Can use Grammar efficiently, effectively and appropriately according to the situation.
BA 104	English Literature	After the completion of the course, the students: 1. Can illustrate and analyse English prose. 2. Can compose, write and speak complete and meaningful ideas. 3. Can understand the various literary genres.
BA 105	Functional English	After the completion of the course, the students: 1. Can enhance their writing skills 2. Can develop their english language skills in speaking, reading and writing. 3. Can Expand their use of grammatically correct and situationally appropriate language in speaking and writing.
BA 105	Functional English (P)	After the completion of the course, the students: 1. Can develop their english language skills in speaking, reading and listening. 2. Can Expand their use of grammatically correct and situationally appropriate language in speaking.
BA 203	English Communication Skills	After the completion of the course, the students: 1. Can illustrate and explain the

		<p>process of communication.</p> <p>2. Can compose, write and speak complete and meaningful ideas.</p> <p>3. Can use Grammar efficiently, effectively and appropriately according to the situation.</p>
BA 204	English Literature	<p>After the completion of the course, the students:</p> <p>1. Can analyse the different kinds of prose writings with an eye to their form and content.</p> <p>2. Can acquire knowledge of the history of English prose writings.</p> <p>3. Can improve their pronunciation.</p>
BA 205	Functional English	<p>After the completion of the course, the students:</p> <p>1. Can make difference between various Accents.</p> <p>2. Can develop their English language skills in speaking, reading and writing.</p> <p>3. Can transcribe the words using IPA symbols.</p>

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
BA 303	English Communication Skills	<p>After the completion of the course, the students:</p> <p>1. Can illustrate and explain the process of communication.</p> <p>2. Can compose, write and speak complete and meaningful ideas.</p> <p>3. Can use Grammar efficiently, effectively and appropriately according to the situation.</p>
BA 304	English Literature	<p>After the completion of the course, the students:</p> <p>1. Can analyse the different kinds of Live Performances.</p> <p>2. Can acquire knowledge of the history of English Drama.</p> <p>3. Can get acquainted with important Literary texts of these Ages.</p>
BA 305	Functional English	<p>After the completion of the course,</p>

		<p>the students:</p> <ol style="list-style-type: none"> <li>1. Can apply english skills in a variety of contexts.</li> <li>2. Can write academically.</li> <li>3. Can demonstrate behavior and attitudes appropriate to social environment.</li> </ol>
BA 323	English Honours	<p>After the completion of the course, the students:</p> <ol style="list-style-type: none"> <li>1. Can understand the impact of History on Literature.</li> <li>2. Can acquire knowledge of the various literary devices.</li> <li>3. Can improve their Cognitive abilities.</li> </ol>
BA 403	English Communication Skills	<p>After the completion of the course, the students:</p> <ol style="list-style-type: none"> <li>1. Can improve their writing skills.</li> <li>2. Can read and compose complete and meaningful ideas.</li> <li>3. Can use Grammar efficiently, effectively and appropriately according to the situation.</li> </ol>
BA 404	<p>English Literature Module-I: The Study of Classics</p> <p>Module-II: Elementary Linguistics</p> <p>Module III: English</p>	<p>After the completion of the course, the students:</p> <ol style="list-style-type: none"> <li>1. Can analyse the different kinds Genres.</li> <li>2. Can acquire knowledge of the history of English Literature</li> <li>3. Can acquaint students with important Literary Masterpieces.</li> </ol> <p>After the completion of the course, the students:</p> <ol style="list-style-type: none"> <li>1. Can analyse the different components of Linguistics</li> <li>2. Can acquire knowledge of the Sentence Formation.</li> <li>3. Can acquaint students with the various branches of Linguistics.</li> </ol> <p>After the completion of the course, the students:</p> <ol style="list-style-type: none"> <li>1. Can join Radio Stations and News Agencies.</li> <li>2. Can Compose News, Reviews and</li> </ol>

	Journalism: Reporting, Editing and Writing	Articles for Magazines. 3. Can conduct Interviews of celebrities and other renowned public figures.
BA 405	Functional English	After the completion of the course, the students: 1. Can conduct and face interviews. 2. Can speak formally on any situation in public. 3. Can improve their formal writing skills.
BA 423	English honours	After the completion of the course, the students: 1.Can understand the impact of History on Literature. 2. Can acquire knowledge of the various literary devices. 3. Can improve their cognitive abilities.

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
BA 503	English Communication Skills	After the completion of the course, the students: 1.Can improve their writing skills. 2.Can read and compose complete and meaningful ideas. 3.Can use appropriate vocabulary in writing various forms of compositions.
BA 504	English Literature	After the completion of the course, the students: 1.Can analyse the different kinds Genres. 2. Can acquire knowledge of the history of English Literature 3. Can acquaint students with important Literary Compositions.
BA 505	Functional English	After the completion of the course, the students: 1. Can join Radio Stations and News Agencies. 2. Can Compose News, Middles and Articles for Magazines.

		3. Can conduct Interviews of celebrities and other renowned public figures.
BA 523	English Honours	After the completion of the course, the students: 1.Can understand the impact of History on Literature. 2. Can acquire knowledge of the various literary devices. 3. Can improve their Cognitive abilities.
BA 603	English Communication Skills	After the completion of the course, the students: 1.Can improve their writing skills. 2.Can read and interpret meaningful ideas in Poetry. 3.Can use appropriate vocabulary in writing various forms of compositions.
BA 604	English Literature Module-I: Study of Classics  Module-II: Phonetics of English  Module III: English For Journalism: Public Relations And Advertising	After the completion of the course, the students: 1.Can analyse the different kinds of Genres. 2. Can acquire knowledge of the history of English and Indian Literature 3. Can acquaint with important Literary Terms.  After the completion of the course, the students: 1.Can analyse and understands the different kinds of Accents. 2. Can acquire knowledge of the formation of sounds. 3. Can improve their Pronunciation.  After the completion of the course, the students: 1. Can understand the structure and functioning of Advertising Agencies. 2. Can defining Public relations with its various aspects. 3. Can understand the circulation of newspapers and various factors involved in it.

BA 605	Functional English	After the completion of the course, the students: 1. Can understand the structure and functioning of Advertising Agencies. 2. Can defining Public relations with its various aspects. 3. Can understand the circulation of newspapers and various factors involved in it.
BA 623	English Honours	After the completion of the course, the students: 1.Can understand the impact of History on Literature. 2. Can acquire knowledge of the various literary devices. 3. Can improve their Cognitive abilities.

## Course Name: Political Science

### Course Outcome:

Course Code	Course Name	Course Outcome
BA-116	POLITICAL THEORY-I	<ul style="list-style-type: none"> <li>• An ability to formulate and construct logical arguments about political phenomena and an ability to evaluate these through empirical and theoretical methods.</li> <li>• Be able to understand the fundamentals of political science.</li> <li>• Be able to understand genesis and growth of political science.</li> </ul>
BA-216	POLITICAL THEORY-II	<ul style="list-style-type: none"> <li>• Be able to familiar with the basic concepts of political science.</li> <li>• Be able to understand the basics theories of political science</li> <li>• Familiarity with different approaches to the study of politics and an ability to apply these to contemporary collective and political problems, and political behavior</li> </ul>
BA-316	INDIAN GOVT & POLITICS-I	<ul style="list-style-type: none"> <li>• Be able to know how the constitution was adopted and why not some other, how the institutions grow in the company of actual politics and fundamental understanding of making Indian constitution &amp; constitutional structure.</li> <li>• Be able to make a good and vigilant citizen of India through understanding of fundamental rights, duties and directive principal of state policy.</li> <li>• Be able to identify and explain the central principles, institutions, procedures, and decision-making processes</li> </ul>

		of the Indian political system.
BA-416	INDIAN GOVT & POLITICS-II	<ul style="list-style-type: none"> <li>• Be able to have a fundamental understanding of working of Indian government and politics at state level.</li> <li>• Be able to identify, describe, analyze the role of different political parties and the electoral scenario of India.</li> <li>• Understand basic strengths and weaknesses of the Indian political system through the application of political concepts and ideas.</li> </ul>
BA-516	Comparative Political Systems (UK and USA)	<ul style="list-style-type: none"> <li>• Understand the political regime types in a comparative framework.</li> <li>• Be able to compare and contrast the main political institutions and processes in UK &amp; USA politics.</li> <li>• Have a stronger and more informed perspective and knowledge of the political systems of UK and USA</li> </ul>
BA-616	International Politics: Theory and Practice	<ul style="list-style-type: none"> <li>• Understand the fundamental concepts, issues, and theories central to international politics.</li> <li>• Be able to understand the role and working of international organization for maintaining world peace.</li> <li>• Demonstrate skills in critical thinking.</li> </ul>

### **Course Name : Public Administration**

#### **Course Outcome:**

<b>Course Code</b>	<b>Course Name</b>	<b>Course Outcome</b>
BA-121	ADMINISTRATIVE THEORY	To acquaint with the theories, approaches, concepts and principles of Public Administration
BA-221	INDIAN ADMINISTRATION	Understand the Constitutional Setting of the Indian Administration and various Governing Bodies under the Central Administration in India.
BA-321	PERSONNEL ADMINISTRATION IN INDIA	Demonstrate the basic concept and principles of Public Personnel Administration and types of personnel system.
BA-421	FINANCIAL ADMINISTRATION IN INDIA	Elaborate the process involved in Budgeting and the role of Ministry of Finance, Comptroller and Auditor General of India.
BA-521	LOCAL GOVERNMENT IN INDIA(with special reference to	Describe the functioning of municipalities, Nagar Panchayats, Urban Programmes and

	Punjab)	Public-Private partnerships and understand the Panchayati Raj Institutions and the rural development programmes
BA-621	DEVELOPMENT ADMINISTRATION IN INDIA(with special reference to Punjab)	Explain the development administration process and Administrative Development in India and describe the officials role in development process and the impact of Liberalization, privatization and Globalisation in Rural, Urban and tribal development.

### **Course Name: Psychology**

#### **Course Outcome:**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
BA-115	General Psychology- A	<ol style="list-style-type: none"> <li>1.The students will be able to establish a solid foundation in psychological theories</li> <li>2. The students will learn variety of research methods used in psychology</li> <li>3. The knowledge will help the students to understand the concepts like intelligence and personality.</li> <li>4. The students will be able to understand basic statistical concepts</li> </ol>
BA-115 (P)	Practical	<ol style="list-style-type: none"> <li>1. The students will be able to administer various tests of personality and Intelligence</li> <li>2 The students will gain knowledge about how to use survey method in psychology</li> </ol>

BA-215	General Psychology- B	<ol style="list-style-type: none"> <li>1. The students will understand biological bases of human behaviour</li> <li>2. The students will develop understanding of emotion, motivation and Sensory Processes</li> <li>3. The students will be able to learn statistical techniques used in psychology</li> <li>4. The students will learn the psychology concepts that can be applied in daily life</li> </ol>
BA-215 (P)	Practical	<ol style="list-style-type: none"> <li>1. The students will be practically able to administer tests of motivation, emotions and level of aspiration</li> <li>2. The students will be able to understand and administer locus of control of the individual</li> </ol>
BA-315	Experimental Psychology-I	<ol style="list-style-type: none"> <li>1. The students will be able to understand various types of theories of Learning and memory</li> <li>2. The students shall be able to make use of Normal Distribution Curve.</li> <li>3. The students will develop an understanding of basics of experimental psychology.</li> </ol>
BA-315 (P)	Practical	<ol style="list-style-type: none"> <li>1. The students will gain practical knowledge about the administration of psychological experiments such as division of attention and maze learning</li> <li>2. The students will be able to use various tests related to learning and memory</li> </ol>

BA-415	Experimental Psychology-II	<ol style="list-style-type: none"> <li>1. The students will develop understanding of perceptual processes.</li> <li>2. The students will gain knowledge of concepts of sensation, attention and perception.</li> <li>3. The students shall be able to understand how bio-psychology is relevant in our daily lives</li> <li>4. The students will gain knowledge about methods of psychophysics</li> </ol>
BA-415 (P)	Practical	The students will gain knowledge about the experiments of perception and psychophysics
BA-515	Abnormal Psychology- A	<ol style="list-style-type: none"> <li>1. The students will be able to understand various perspectives of psychopathology</li> <li>2. The students will gain knowledge of nature, aetiology, symptoms and treatment of disorders.</li> <li>3. The students will understand the criteria of abnormal behavior</li> </ol>
BA-515 (P)	Practical	<ol style="list-style-type: none"> <li>1. The students will be able to administer the tests of anxiety and adjustment</li> <li>2. The students will be able to assess the general health of an individual</li> <li>3. The students will gain knowledge about the projective tests.</li> </ol>
BA- 615	Abnormal Psychology-B	<ol style="list-style-type: none"> <li>1. The students will learn and apply various psychotherapies.</li> <li>2. The students will understand substance related disorders</li> <li>3. The students will gain knowledge about the applications of various psychotherapies</li> </ol>

BA-615 (P)	Practical	1. The student will be able to make project report 2. The students will develop understanding of abnormal behaviour by doing practical work 3. The students will understand the process of case study
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**sYSn 2019-20 ivc pVHwey jwx vwly islybsW dy igAwn vrDk is`ty**

**kors - bI.ey/ B.A.**

**sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਬੀ. ਏ ਦਾ ਕੋਰਸ ਕਰਨ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀ ਵੱਖ-ਵੱਖ ਖੇਤਰਾਂ ਵਿੱਚ ਗਿਆਨ ਹਾਸਲ ਕਰਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ । ਬੀ. ਏ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਅਤੇ ਪੰਜਾਬੀ ਸਾਹਿਤ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਸਾਹਿਤ ਲਿਖਣ ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI.ey pws krn auvrMq :**

1. ਬੀ.ਏ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ivSw ividAwrQIAW dI srpb`KI s^SIAq auswrI leI swrQk hY [
2. ieh ivSw ividAwrQIAW leI v`K-v~K mukwbly dIAW pRIiKAwvW dy Xog bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ividAwrQI/jigAwsU nUM BwSw,swihq,klw Aqy siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [
5. ieh ivSw ividAwrQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl ies mSInI Xu`g vwllI qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw krDw hY [

6. ieh ivSw ividAwrQIAW nUM pMjwbI BwSw Aqy gurmuKI ilpI ivc inpuMn bxwaudw hY [

7. ieh ivSw ividAwrQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry sMvydnSIl bxwaudw hY[

**bI.ey Bwg -pihlw,smYstr pihlw/ B.A. -I, Sem-I**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
<b>bIey/ BA 101</b>	pMjwbI lwzmI	<p>1. ies pwTkRm dw mnorQ ividAwrQIAW nMU pMjwbI swihq pVHn dI jwg lwauxw, aunHW AMdr rcnwqmk rucIAW pYdw krnw Aqy AwDuink smwj ivc PYly ivroDW, ivsMgqIAW qy qxwvW nMU Gtwauxw hY [</p> <p>2. mwq-BwSw dy ivAwkrn dy iviBMn- iviBMn p`KW dw AiDAYn ividAwrQIAW nMU BwSw ivc muhwrq hwisl krn Aqy aucyrI is`iKAw gRihx krn leI pRyirq krdw hY[</p> <p>3. mwq-BwSw dw igAwn BwSw dI AmIrI Aqy mh`qqw nUM aujwgr krdw hY[</p> <p>4. mnu`K dIAW ivvhwrk loVW nMU mu`K r`Kdy hoey ic`TI-p`qr nMU vI ies pwTkRm ivc r`iKAw igAw hY[</p> <p>5. ividAwrQIAW nUM smwj ivc &amp;Yl rhy durwcwr Aqy smwj nUM drpyS sm`isAvW nwl sMbMiDq iviSAw bwry sucyq krnw Aqy icMqnSIl bxwauxw hY[</p>
<b>bIey/ BA 102</b>	ਪੰਜਾਬੀ ਸਾਹਿਤ	<p>1. ies pwTkRm dw mnorQ ividAwrQIAW nUM vDIAW ienswn bxwauxw Aqy smwj ivc &amp;Yl rhy durwcwr pRqI jwgrUk krnw hY[</p> <p>2. swihq ividAwrQIAW nUM siBAwcwr,ieiqhws,</p>

		<p>imiQhws, Drm Aqy ivcwrDwrk qOr qy zmInI hkIkq nUM smJx ivc smr`Q huMdw hY[</p> <p>3. swihq dy rUp kivqw mnu`K nUM qxwE BrI izMdgI ivc vI ijaUNx dw bl Aqy smr`Qw b^SdI hY[</p> <p>4. pMjwbI swihq dw ieiqhws mn`K nUM izMdgI ijaUx dI syD Aqy v`Kry-v`Kry simAW ivc pYdw hoey swihq Aqy aunHW dIAw isiKAww qoN auswrU syD imldI hY[</p> <p>5. swihq dy ieiqhws bwry jwxkwrI ivedAwRQIAW AMdr pVHn dI rucI nUM vDyry pRcMf krdI hY[</p>
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**bI.ey Bwg -pihlw, smYstr dUjw/ B.A.- I, Sem- II**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
<b>bIey/ BA 201</b>	pMjwbI lwzmI	<p>1. ivedAwRQIAW nUM pMjwbI swihq dy vwrqk dy v`Kry-v`Kry iviSAW nUM pVHwauX dw mnorQ auhnW AMdr auswrU rucIAW nUM pYdw krnw hY [</p> <p>2. pMjwbI BwSw Aqy DunIAW dw AiDAYn ivedAwRQIAW nUM BwSw dI Su`Dqw, aucwrX dy p`Dr qy Aqy lyKx dy p`Dr qy inpuMn bxwauXw hY[ pMjwbI BwSw dy kyNdrI rUp Aqy aus ivc Aw rhIAW qbdIliIAW Aqy BwSw dy v`Kry-v`Kry rUpW bwry jwxkwrI dyxw hY [</p> <p>3. lok myly Aqy iqauhwrW sMbMDI AiDAYn ivedAwRQIAW nUM Awpxy siBAwcwr Aqy lokDwrw dy inkt AiDAYn Aqy ivSvIkRN dy p`Dr qy Aw rhIAW qbdIliIAW bwry vfm`ulI jwxkwrI dyxw Aqy auhnW AMdr svY-mwx nUM jgwauNwx hY[</p>

<p><b>bIey/ BA 202</b></p>	<p>ਪੰਜਾਬੀ ਸਾਹਿਤ</p>	<p>1. pMjwbI swihq dw ieiqhws ivedAwRQIAW nUM pMjwbI swihq dy gOrvmeI ivrsy qoN jwxU krvwauNdw hY[</p> <p>2. swihq dIAW DwrwvW is`Dy Ais`Dy qOr qy ivedAwRQI nUM smwj dy ivkws leI pRXqnSIL bxwauNdIAW hn[</p> <p>3. swihq lok-rUVIAW nUM ivigAwnk idRStI qoN smJx dI jWc isKwauNdw hY [</p> <p>4. ivedAwRQIAW nUM smwj ivc &amp;Yl rhy durwcwr Aqy smwj nUM drpyS sm`isAvW nwl sMbMiDq iviSAw bwry sucyq krnw Aqy icMqnSIL bxwauNdw hY[</p>
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**bI.ey Bwg- dUjw/B.A.- II  
sYSn 2019-20**

**bI.ey Bwg dUjw, smYstr qIjw/B.A.- II, Sem- III**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
<p><b>bIey/ BA 301</b></p>	<p>pMjwbI lwzmI</p>	<p>1. smkwI pMjwbI kivqw smkwI dIAW iviBMn iviBMn ivsMgqIAW pRqI cyqMnqw pRdwn krdI hoeI ivedAwRQI nUM smwijk sm`isAww nwl jUJx dI smr`Qw Aqy izMdgI ijaUx dw bl isKwauNdI hY[</p> <p>2. smkwI pMjwbI khwxI sMgRih dy mwiDAm rwhIN ivedAwRQI nUM swihq pVHn dI lgn lwauNdw Aqy ies pwTkRm dw mnorQ smwj ivc ikqwb siBAwCwr pYdw krnw hY[</p> <p>3. ivedAwRQIAW nUM pMjwbI BwSw dy nym-pRbMDW</p>

		<p>qoN jwxU krvwauwx hY [</p> <p>4. ividAwRQIAW nUM swihq dI Awlocnw krn sMbMDI v`KrIAW-v`KrIAW pRxlIAW qoN jwxU krvwauwx qy Awpxy jIvn ivc v`K-v`K vrqwirAW nUM GoKx dI sUJ pYdw krnw hY[</p> <p>5. ividAwRQIAW nUM siBAwcwr dy sMklp dI jwxkwrI dyx leI smwj ivc pYdw hoeIAW kurIqIAW nUM ^qm krnw Aqy inroey siBAk smwj dI isrjxw krnw hY[</p>
<b>bIey/ BA 302</b>	ਪੰਜਾਬੀ ਸਾਹਿਤ	<p>1. ies islybs dw mnorQ ividAwRQIAW AMdr rcnwqmk rucIAW pYdw krnw hY[</p> <p>2. pMjwbI swihq ividAwRQIAW nUM m`DkwI pMjwbI swihq smwj dI bxqr Aqy smwijk siQqIAW bwry jwxU krvwaudw hY [</p> <p>3. ies islybs dw mnorQ ividAwRQIAW nUM AwDuink swihq rUp `khwxI' dy mwiDAM rwhI smwj ivc vwpr rhy viBMn vrqwirAw qoN jwxU krvwaudw hY[</p> <p>4. ies islybs dy mwiDAM rwhIN ividAwRQI swihq dy v`K-v`K swihq rUpW dy nym ivDwn qoN jwxU huMdw hY[</p>

**bI.ey Bwg dUjw, smYstr cOQw/B.A.- II, Sem- IV**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
<b>bIey/ BA 401</b>	pMjwbI lwzmI	<p>1. pMjwbI swihq dw rUp nwtk ividAwRQI-mn dw ivrycn kr dy hoey, a`ucqm jIvn jWc isKwauNdw hY [</p> <p>2. nwtk ividAwRQIAW AMdr klpnw dy AMS pYdw</p>

		<p>krky smwijk XQwrQ nwl joVdw hY [</p> <p>3. gurmuKI il`pI dw ieiqhws ividAwrQIAW nUM BwSw ilKx dy smr`Q Aqy mnu`KI BwSw dy ieiqhws nUM smJx ivc pRmu`K rol Adw krwd hY [</p> <p>4. muhwvirAW dw AiDAYn ividAwrQIAW dI ivvhwrk igAwn ivc vwDw krwd hY [</p> <p>5. m`DkwLI pMjwbI swihq ividAwrQIAW nUM m`DkwLI smwj dw igAwn idMdy hoey, swihq dy iviBMn rUpwkwr Aqy auhnW dI Awpo-AwpxI swihqk mh`qqw qoN jwxU krvwaNudw Aqy izMdgI ijaUx dI jWc isKwaNudw hY[</p>
<p><b>bIey/ BA 402</b></p>	<p>pMjwbI swihq</p>	<p>1. ies pwTkRm dw mnorQ ividAwrQIAW nUM aucqm Aqy sucwrU jIvn jWc pRdwn krnw hY[</p> <p>2. iesdy AMqrgq m`DkwLI swihq, siBAwcwr Aqy pMjwbI siBAwcwr Aqy p`CmI Awlocnw pRxwLIAW nwl sMbMDq mUl sMklpW nUM islybs ivc Swiml kIqw igAw hY[</p> <p>3. ies pwTkRm dy ADIn ividAwrQI m`DkwLI DwrwvW (sU&amp;I kwiv, ik`sw kwiv, bIr kwiv ) ividAwrQIAW dy jIvn ivc rwh munwry dw kMm krdIAW hn [</p> <p>4. ies pwTkRm dw mnorQ ividAwrQIAW nUM smwijk srokwrW nwl joVnw Aqy auhnW dI S^sIAq iv`c inKwr vI ilAwauxw hY[</p> <p>5. ies pwTkRm dw mnorQ ividAwrQIAW nUM cyqMn Aqy icMqnSIl bxwaux dy nwl-nwl ies mSInI Xu`g vwLI qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw krnw Aqy auhnW nUM sMvydnSIl bxwauxw hY[</p>

**bI.ey Bwg- qIjw/ B.A.-III**  
**sYSn 2019-20**

**bI.ey Bwg-qIjw, smYstr-pMjvW/B.A.- III, Sem- V**

वेरम वेड	वेरमरा नं	pMjwbI BwSw dy igAwn vrDk is`ty
<b>bIey/ BA 501</b>	pMjwbI lwzmI	<p>1. ies pwTkRm dI pVHweI nwl ividAwrQI nUM sucwrU jIvn jWc dI is`iKAw imldI hY[</p> <p>2. ies pwTkRm iv`c l`gy nwl dw AiDAYn ividAwrQI nUM smwj ivcly AxgOly ikrdwrW nUM rUbrU krwv ky ivvykSIL bxwauNdw hY[</p> <p>3. ieh pwTkRm nw kyvl ividAwrQI nUM mwq-BwSw nwl joVdw hY blik ausdy mn AMdr mwq BwSw pRqI siqkwr pYdw vI krdr hY[</p> <p>4. ieh pwTkRm ividAwrQI dI kuSl lyKxI, BwSw dy Su`D aucwrn iv`c mddgwr swibq huMdw hY[</p> <p>5. ieh pwTkRm ividAwrQI nUM ivAkqIgg p`Dr qy ie`k su`cjI jIvn jWc Aqy smwijk sUJ-bUJ vI pRdwn krdr hY[</p>
<b>bIey/ BA 502</b>	pMjwbI swihq	<p>1. ieh pwTkRm ividAwrQIAW dIAW nw kyvl AiqRpq sMvydnwvW nUM hulwrw idMdw hY blik ausdI lyKx pRiqBw nUM shI idSw pRdwn krdr hY[[</p> <p>2. ieh pwTkRm ividAwrQIAW nUM smwijk ivsMgqIAW, pRwcIn ivrwsq, ausdy Drwql, BwSw Awidk pRqI lwhyvMd sm`grI pRdwn krdr hY[</p> <p>3. kivqw dw ieighws, iesdI mu`FLI jwxkwrI, iesdy gihn AiDAYn nwl ividAwrQIAW AMdr kwiv isrjxw pYdw krn dy Xog bxdw hY[</p> <p>4. nwtk ividAwrQIAW AMdr ie`k klpink idRS</p>

		<p>swkwr krky ausdI klpink SkqI nUM XQwrQk rUp idMdw hY[</p> <p>5. swihq dIAW DwrwvW is`Dy Ais`Dy qOr qy ividAwRQI nUM smwj dy ivkws leI pRXqnSIl bxwauNdIAW hn[</p> <p>6. ieh pwTkRm ividAwRQIAW nUM svY dI pVcol krn dy nwl-nwl icMqnSIl bxwauNdw hY Aqy AwdrSk smwj isrjx leI pRyirq krDw hY[</p>
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**bI.ey Bwg-qIjw smYstr-CyvW B.A.- III, Sem- VI**

वेरम वेड	वेरमसा नं	pMjwbI BwSw dy igAwn vrDk is`ty
<b>bIey/ BA 601</b>	pMjwbI lwzmI	<p>1. ieh pwTkRm pMjwbI lokDwrw dw inkt AiDAYn krvw ky ausdy v`Kry-v`Kry p`KW nUM aujwgr krDw Aqy Awpxy mwX-m`qy ivrsy pRqI siqkwr dI BwvNw pYdw krDw hY[</p> <p>2. lokDwrweI vrqwirAW bwry mu`FlI jwxkwrI dy ky ividAwRQI nUM Apxy-Awly duAwly pRqI ausdI ijMmyvwrI dw boD krvwauNdw hY[</p> <p>3. ivSvIkRn dy v`Ddy pswr nUM dyKidAW ieh pwTkRm ividAwRQIAW nUM v`KrIAW-v`KrIAW BwSwvW dy igAwn Aqy Anuvwd krn dy smr`Q bxwauNdw hY[</p> <p>4. ieh pwTkRm ividAwRQIAW nUM mwq-BwSw dy nymW sMbMDI jwgrUk krDw hY Aqy sMcwr leI ausdy vwk boD nUM inKwrDw Aqy aus AMdr sIkw pYdw krDw hY[</p>
<b>bIey/ BA 602</b>	pMjwbI swihq	<p>1. Ajoky mSInIkRn dy dOr AMdr swihq hI ividAwRQI nUM in`jqv qoN prHy smUhgq smwijk ivfMbnvwW pRqI icMiqq krDw hY[</p> <p>2. ieh pwTkRm ividAwRQI nUM kivqw rcnw qoN pihlW ausdy ieiqhws,inkws Aqy ivkws dy nwl-</p>

	<p>nwl ausdy sunihrI Biv`K dw boD krw ky ausnUM ie`k kuSl lyKxI leI auqSwihq krw hY[</p> <p>3. swihq dw ivSyS rUp s&amp;rnwmw ividAwrQI nUM dyS-ivdyS dy Drwql, jlvwXU, AwkrSk QvwW pRqI mnorMjnI FMg nwl loVINdw igAwn dyx dy smr`Q huMdw hY[</p> <p>4. swihq dIAW iviBMn-iviBMn ivDwvW dw fUMGw AiDAYn ividAwrQI mn AMdrly swihqkwr nUM ie`k shI syD pRdwn krw hY[</p> <p>5. ieh pwTkRm ividAwrQIAW nUM igAwn BrpUr jwxkwrI idMdw hY Aqy ausdy mn dIAW AiqRpq sMvydnwvW nUM ie`k syD pRdwn krw hoieAw ie`k su`cjI jIvn-jWc vI isKwauNdw hY[</p>
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## ਕੋਰਸ - bI.bI.ey/ B.B.A.

**sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਬੀ. ਬੀ. ਏ/ bI. vokySnl (Awr. AY~m) ਦੁਆਰਾ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ।

**bI.bI.ey/bI. vokySnl (Awr. AY~m) pws krn auprMq :**

1. ieh ivSw ividAwrQIAW dI srbp`KI s^SIAq auswrI leI swrQk hY [
2. ieh ivSw ividAwrQIAW leI v`K-v~K mukwblydIAW pRIiKAwvW dy Xog bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ividAwrQI/jigAwsU nUM BwSw, swihq, klw Aqy siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [
5. ieh ivSw ividAwrQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl ies mSInI Xu`g vwli qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw krw hY [
6. ieh ivSw ividAwrQIAW nUM pMjwbI BwSw Aqy gurmUKI ilpI ivc inpuMn bxwaudw hY [

7. ieh ivSw ividAwrQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry sMvydnSIl bxwaudw hY[

**bI.bI.ey Bwg pihlw, smYstr pihlw/B.B.A.- I, Sem-I**

वेरम वेड	वेरमसा नं	pMjwbI BwSw dy igAwn vrDk is`ty
<b>bIbIey/ BBA 102</b>	pMjwbI lwzmI	<p>1. nwvl ividAwrQIAW nUM smwijk qOr qy cyqMn krdrw hY Aqy KUbsUrq izdgI ijaUNx dw bl bKSdw hY[</p> <p>2. pwTkRm ivclw nwvl `eyhu hmwrw jIvxw` jwgIrdwrI smwj ivc AOrq dI siQqI bwKUbI pyS krdrw hY[</p> <p>3. pMjwbI BwSw Aqy DunIAW dw AiDAYn ividAwrQIAW nUM BwSw dI Su`Dqw, aucwrx dy p`Dr qy Aqy lyKx dy p`Dr qy inpuMn bxwauxw hY[</p> <p>5. swfy smwj ivclIAW GtnwvW, clMq mwmilAW qoN jwxU krwvauNx leI inbMD rcnw ividAwrQI leI lwhyvMd swibq huMdI hY[</p> <p>6. ieh pwTkRm ividAwrQIAW nUM smwj k ivsMgqIAW pRqI jwgrUk krky auhnW dy smwDwn pRqI is`iKAq krdrw hY[</p> <p>7. ies ivSy dw mnorQ sMbMiDq qknIkI SbdwvLI rwhIN ividAwrQI nMU swDwrx jn-jIvn nwl vrqoN-ivhwr krn Aqy sMbwd rcwaux dy Xog bxwauxw hY[</p> <p>8. ies pwTkRm dw mnorQ ividAwrQIAW nUM pMjwbI swihq pVHx dI jwg lwauxw Aqy auhnW AMdr rcnwqmk rucIAW pYdw krnw hY[</p>

**bI.bI.ey Bwg pihlw, smYstr dUjw/B.B.A.- I, Sem-II**

<b>वेरस वेड</b>	<b>वेरसदा नं</b>	<b>pMjwbI BwSw dy igAwn vrDk is`ty</b>
<b>bIbIey/ BBA 202</b>	pMjwbI lwzmI	<p>1. ies kors iv`c l`gI pusqk `coxvyN pMjwbI inbMD', pMjwbI swihq dy mhwn swihqkwrW dy ivcwrW qoN jwxU krwauNdw hY[</p> <p>2. ividAwrQIAW nMU pMjwb dIAW aupBwSwvW Aqy aunHW dIAW ivl`KqvwW qoN jwxU krwieAw jWdw hY[</p> <p>3. pMjwbI BwSw dI muhwrq hwisl krn leI SuD BwSw vrqoN-ivhwr pRqI jwxU krwauNdw hY[</p> <p>4. ividAwrQI nMU AwauNdy smyN d&amp;qrI kwrj leI iqAwr krn leI p`qr, ic`TI-p`qr ilKx dy kwibl bxwauNdw hY[</p> <p>5. ies kors dw mnorQ ividAwrQI nMU AwpxI BwSw, smwj, pMjwbI siBAwcwr dIAW iviBMn ivSySqvwW, gOrvmeI ieighws dI jwxkwrI idMidAW ienHW iv`coN smwijk srokwrW nMU shI pirpyK iv`c smJx Aqy icMqn krn Xog bxwauNdw hY[</p> <p>6. ies dy nwl hI BwSw dw shI aucwrX, DunIAW/BwSw dI kuSlqwpUvk vrqoN krn dy Xog bxwauNdw hY[</p>

**bI.bI.ey Bwg-dUjw/B.B.A-II**

**sYSn 2019-20**

**bI.bI.ey Bwg dUjw, smYstr qIjw/B.B.A.- II, Sem-III**



		<p>BwSw ilKx dy smr`Q Aqy mnu`KI BwSw dy ieiqhws nUM smJx ivc pRmu`K rol Adw krdw hY [</p> <p>4. muhwvirAW dw AiDAYn ividAwrQIAW dI ivvhwrk igAwn ivc vwdw krdw hY [</p>
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**bI.bI.ey Bwg-qIjw/ B.B.A.-III**  
**sYSn 2019-20**

**bI.bI.ey Bwg qIjw, smYstr pMjvW/B.B.A.- III, Sem-V**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
<b>BBA</b> <b>502</b>	pMjwbI lwzmI	<p>1. ieh pwTkRm pMjwbI lokDwrw dw inkt AiDAYn krvw ky ausdy v`Kry-v`Kry p`KW nUM auj`wgr krdw Aqy Awpxy mx-m`qy ivrsy pRqI siqkwr dI Bwvnmw pYdw krdw hY[</p> <p>2. lokDwrweI vrqwirAW bwry mu`FlI jwxkwrI dy ky ividAwrQI nUM Apxy-Awly duAwly pRqI ausdI ijMmyvwrI dw boD krvwauNdw hY[</p> <p>3. ieh pwTkRm ividAwrQIAW nUM smwjK ivsMgqIAW pRqI jwgrUk krky auhnW dy smwDwn pRqI is`iKAq krdw hY[</p> <p>4. ieh pwTkRm ividAwrQIAW nUM mwq-BwSw dy nymW sMbMDI jwgrUk krdw hY Aqy sMcwr leI ausdy vwk boD nUM inKwrw Aqy aus AMdr sIkw pYdw krdw hY[</p>

**bI.bI.ey Bwg qIjw, smYstr CyvW/B.B.A.- III, Sem-VI**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty

<b>BBA 602</b>	pMjwbI lwzmI	1. ies pwTkRm iv`c l`gy nwvl dw AiDAYn ividAwRQI nUM smwj ivcly AxcGoly ikrdwrW nUM rUbrU krvw ky ivvykSIl bxwauNdw hY[ 2. ivSvIkrn dy v`Ddy pswr nUM dyKidAW ieh pwTkRm ividAwRQIAW nUM v`KrIAW-v`KrIAW BwSwvW dy igAwn Aqy Anuvwd krn dy smr`Q bxwauNdw hY[ 3. ies pwTkRm dI pVHweI nwl ividAwRQI nUM sucwrU jIvn jWc dI is`iKAw imldI hY[ 4. mwq-BwSw dy ivAwkrn dy iviBMn- iviBMn p`KW dw AiDAYn ividAwRQIAW nMU BwSw ivc muhwrq hwisl krn Aqy aucyrI is`iKAw gRihx krn leI pRyirq krdrw hY[
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**bI. vokySnI (AwR. AY~m) Bwg pihlw/B.Voc.(RM)  
sYSn 2019-20**

**bI. vokySnI (AwR. AY~m) Bwg pihlw, smYstr-pihlw/B.Voc.(RM)-I,Sem-I**

<b>वेरम वेड</b>	<b>वेरमसा नां</b>	<b>pMjwbI BwSw dy igAwn vrDk is`ty</b>
<b>BVRM 101</b>	pMjwbI lwzmI	1. nwvl ividAwRQIAW nUM smwijk qOr qy cyqMn krdrw hY Aqy KUbsUrQ izdgI ijaUNx dw bl bKSdw hY[ 2. pwTkRm ivclw nwvl `eyhu hmwrw jIvxw` jwgIrdwrI smwj ivc AOrq dI siQqI bwKUbI pyS krdrw hY[ 3. pMjwbI BwSw Aqy DunIAW dw AiDAYn ividAwRQIAW nUM BwSw dI Su`Dqw, aucwrx dy p`Dr qy Aqy lyKx dy p`Dr qy inpuMn bxwauwx hY[ pMjwbI BwSw dy kyNdrI rUp Aqy aus ivc Aw rhIAW qbdIlIAW Aqy BwSw dy v`Kry-v`Kry rUpW bwry jwxkwrI dyxw hY [

		<p>4. ies pwTkRm dw mnorQ ivedAwRQIAW nUM pMjwbI swihq pVHx dI jwg lwauxw Aqy auhnW AMdr rcnwqmk rucIAW pYdw krnw hY[</p> <p>5. ies pwTkRm dw mMqv AwDuink Xu`g dy mnu`K dy AMdr-bwhr PYly-ivroDW, ivsMgqIAW qy GtnwvW nUM nwtk ivDw rwhI isiKAq krnw hY[ ikauik swihq dI nwtk ivDw dw mnu`K dI smwijk ivDw nwl Aiq nyVlw sMbMD hY [</p>
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**ਕੋਰਸ - bI. sI. ey./B.C.A.  
sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਬੀ. ਸੀ. ਏ/bI.vokySn1 (swPtvAr ifvYlpmYnt) ਕੰਪਿਊਟਰ dy ਖੇਤਰ ਨਾਲ ਸਬੰਧਿਤ ਕੋਰਸ ਹਨ। ਇਸ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI. sI. ey. /bI.vokySn1 (swPtvAr ifvYlpmYnt) pws krn auprMq:**

1. ieh ivSw ivedAwRQIAW dI srbp`KI s^SIAq auswrI leI swrQk hY [
2. ieh ivSw ivedAwRQIAW leI v`K-v~K mukwblydIAW pRIiKAwvW dy Xog bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ivedAwRQI/jigAwsU nUM BwSw,swihq,klw Aqy siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [
5. ieh ivSw ivedAwRQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl ies mSInI Xu`g vwlI qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw krDw hY [
6. ieh ivSw ivedAwRQIAW nUM pMjwbI BwSw Aqy gurmuki ilpI ivc inpuMn bxwaudw hY [
7. ieh ivSw ivedAwRQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry sMvydnSIl bxwaudw hY[

**bI. sI. ey. Bwg pihlw, smYstr pihlw/ B.C.A.-I, Sem- I**

वेरस वेड	वेरसदा नं	pMjwbI BwSw dy igAwn vrDk is`ty
<b>BCA 103</b>	pMjwbI lwzmI	<p>1.ies kors iv`c ividAwrQI nMU nwl ivDw-ivDwn bwry jwxU krvwieAw jwvygw[</p> <p>2. ies pwTkRm dw mnorQ smwj ivcly bhu-p`KI pswrW; ijs iv`c smwjk, AwriQk, prMprk rUVIAW qoN jwxU krvw ky pMjwb dy siBAwcwr, sMsikRqI pRqI ivigAwnk nzrIAW pYdw krnw hY[</p> <p>3. ividAwrQI nMU smwijk, vwqvrX Aqy siBAwcwrk p`KW dI jwxkwrI pRdwn krky aus iv`c mOilk rcnwqmk rucIAW pYdw krnw hY [</p> <p>4. pMjwbI dw ividAwrQI pMjwbI dIAW DunIAW dy aucwr FMg Aqy aucwrn sQwn qoN jwxU ho ky BwSw dy shI pRXog nMU qrjIh dyvygw[</p> <p>5. ivSy nwl sMbMiDq qknIkI SbdwvLI ividAwrQI nMU AwauNdy jIvn iv`c swDwrX jn-jIvn nwl vrqoN-ivhwr krn dy kwibl bxwauXw hY[</p> <p>6. ies islybs dw mnorQ ividAwrQIAW nMU cOigrdy pRqI jwgirq krky cyqMn/ sMvydnSIl bxwauXw hY[</p>

**bI. sI. ey. Bwg pihlw, smYstr dUjw/ B.C.A.-I, Sem-II**

वेरस वेड	वेरसदा नं	pMjwbI BwSw dy igAwn vrDk is`ty
<b>BCA 203</b>	pMjwbI lwzmI	<p>1.ies kors dw mnorQ ividAwrQI nMU `coxvyN pMjwbI inbMD' rwhIN pMjwbI dy mhwn inbMDkwrW dy ivcwrW qoN jwxU krvwauXw hY[</p> <p>2. ies islybs dw mnorQ ividAwrQIAW nMU pMjwbI dIAW aup-BwSwvW dIAW ivSySqvwW, ivl`KxvwW qo jwxU krvwauXw hY[</p> <p>3. ies dy nwl hI BwSwvW Aqy aupBwSwvW dI ivl`Kxqw nMU smJx Xog bxwauNdw hY[</p> <p>4. ies ivSy dw mnorQ sMbMiDq qknIkI</p>

		<p>SbdwvLI rwhIN ividAwrQI nMU swDwrX jn- jIvn nwl vrqoN-ivhwr krn Aqy sMbwd rcwauX dy Xog bxwauXw hY[</p> <p>5. ies kors rwhIN ividAwrQI swihq swihqk ivDw inbMD nwl joV ky pMjwbIAq nwl joVnw[</p> <p>6. ies kors rwhIN ividAwrQI nMU cOigrdy pRqI jwgirq krky aus nMU cyqMn/ sMvydnSIL bxwauXw hY[</p>
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**bI.vokySnI (swPtvyAr ifvYlpmYnt)/B. Voc. (SD)  
sYSn 2019-20**

**bI.vokySnI (swPtvyAr ifvYlpmYnt) Bwg-pihlw/B.Voc (SD)- I**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
<b>BVSD 102</b>	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ies pwTkRm iv`c l`gy nwl dw AiDAYn ividAwrQI nUM smwj ivcly AxxOly ikrdwrW nUM rUbrU krw ky ivvykSIL bxwauNdw hY[</p> <p>2. ivSvIkRn dy v`Ddy pswr nUM dyKidAW ieh pwTkRm ividAwrQIAW nUM v`KrIAW-v`KrIAW BwSwvW dy igAwn Aqy Anuvwd krn dy smr`Q bxwauNdw hY[</p> <p>3. ies pwTkRm dI pVHweI nwl ividAwrQI nUM sucwrU jIvn jWc dI is`iKAw imldI hY[</p> <p>4. mwq-BwSw dy ivAwkrn dy iviBMn- iviBMn p`KW dw AiDAYn ividAwrQIAW nMU BwSw ivc muhwrq hwisl krn Aqy aucyrI is`iKAw gRihx krn leI pRyirq krw hY[</p> <p>5. qknIkI SbdwvLI dw mnorQ ividAwrQIAW nUM AwpxI mwq-BwSw ivc vrqy jw rhy Sbdw dw Awm lokW nwl qwl-myl bxwauX ivc shweI</p>

		huMdw hY[
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**bI . kwm (Awnrz) / B.Com (Hon's)  
sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਇਸ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI . kwm (Awnrz)/bI.kwm/bI. ey. AY~& krn auprMq :**

1. ieh ivSw ividAwrQIAW dI srbp`KI s`SIAq auswrI leI swrQk hY [
2. ieh ivSw ividAwrQIAW leI v`K-v~K mukwblydIAW pRIiKawvW dy Xog bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKaw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ividAwrQI/jigAwsU nUM BwSw, swihq, klw Aqy siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [
5. ieh ivSw ividAwrQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl ies mSInI Xu`g vwlI qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw krDw hY [
6. ieh ivSw ividAwrQIAW nUM pMjwbI BwSw Aqy gurmuki ilpI ivc inpuMn bxwaudw hY [
7. ieh ivSw ividAwrQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry sMvydnSIl bxwaudw hY[

**bI . kwm (Awnrz) Bwg-pihlw, smYstr-pihlw/B.Com (Hon's), -I, Sem-I**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
BCOMH 105	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	1. ies pwTkRm dw mnorQ ividAwrQIAW nMU pMjwbI swihq pVHn dI jwg lwauxw, aunHW AMdr rcnwqmk rucIAW pYdw krnw Aqy AwDuink smwj ivc PYly ivroDW, ivsMgqIAW qy qxwvW nMU

		<p>Gtwauxw hY [</p> <p>2. mwq-BwSw dy ivAwkrn dy iviBMn- iviBMn p`KW dw AiDAYn ividAwrQIAW nMU BwSw ivc muhwrq hwisl krn Aqy aucyrI is`iKAw gRihx krn leI pRyirq krdw hY[</p> <p>3. mwq-BwSw dw igAwn BwSw dI AmIrI Aqy mh`qqw nUM aujwgr krdw hY[</p> <p>4. mnu`K dIAW ivvhwrk loVW nMU mu`K r`Kdy hoey ic`TI-p`qr nMU vI ies pwTkRm ivc r`iKAw igAw hY[</p> <p>5. swfy smwj ivclIAW GtnvwW, clMq mwmilAW qoN jwxU krvwauNx leI inbMD rcnw ividAwrQI leI lwhyvMd swibq huMdi hY[</p>
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**bI. kwm (Awnrz), Bwg-pihlw smYstr-dUjw, B.Com (Hon's), -I, Sem-II**

वेरम वेड	वेरमसा नं	pMjwbI BwSw dy igAwn vrDk is`ty
BCOMH 205	पंजाबी ललामी	<p>1. ividAwrQIAW nUM pMjwbI swihq dy vwrqk dy v`Kry-v`Kry iviSAW nUM pVHwauX dw mnorQ auhnW AMdr auswrU rucIAW nUM pYdw krnw hY [</p> <p>2. pMjwbI BwSw Aqy DunIAW dw AiDAYn ividAwrQIAW nUM BwSw dI Su`Dqw, aucwrX dy p`Dr qy Aqy lyKx dy p`Dr qy inpuMn bxwauXw hY[</p> <p>3. pMjwbI BwSw dy kyNdrI rUp Aqy aus ivc Aw rhIAW qbdIIIAW Aqy BwSw dy v`Kry-v`Kry rUpW bwry jwxkwrI dyxw hY [</p> <p>4. lok myly Aqy iqauhwrW sMbMDI AiDAYn ividAwrQIAW nUM Awpxy siBAwCwr Aqy lokDwrw dy inkt AiDAYn Aqy ivSvIkrn dy p`Dr qy Aw</p>

		rhIAW qbdIliIAW bwry vfm`ulI jwxkwrI dyxw Aqy auhnW AMdr svY-mwx nUM jgwauNxw hY[
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**वेरम- bI. kwm/B.Com**  
**sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**bI. kwm, Bwg-pihlw, smYstr-pihlw/B.Com-I, Sem-I**

वेरम वेड	वेरमरा नं	pMjwbI BwSw dy igAwn vrDk is`ty
<b>BCOM 104</b>	पंजाबी लाजमी	<p>1. ies pWtkRm dw mnorQ ividAwrQIAW nMU pMjwbI swihq pVHn dI jwg lwauxw, aunHW AMdr rcnwqmk rucIAW pYdw krnw Aqy AwDuink smwj ivc PYly ivroDW, ivsMgqIAW qy qxwvW nMU Gtwauxw hY [</p> <p>2. ivAwkrn dy iviBMn- iviBMn p`KW dw AiDAYn ividAwrQIAW nMU BwSw ivc muhwrq hwisl krn Aqy aucyrI is`iKAw gRihx krn leI pRyirq krdw hY[</p> <p>3. mwq-BwSw dw igAwn BwSw dI AmIrI Aqy mh`qqw nUM aujwgr krdw hY[</p> <p>4. mnu`K dIAW ivvhwrk loVW nMU mu`K r`Kdy hoey ic`TI-p`qr nMU vI ies pWtkRm ivc r`iKAw igAw hY[</p> <p>5. islybs ivc drz pusqk `kQw-rMg' duy mwiDAm rwhIN ividAwrQIAW nUM smwj ivc &amp;Yl rhy durwcr Aqy smwj nUM drpyS sm`isAvW nwl sMbMiDq iviSAw bwry sucyq krnw Aqy icMqnSIl bxwauxw hY[</p> <p>6. ividAwrQI leI pMjwbI BwSw dw Su`D aucwrn</p>

		<p>Aqy shI ilKx pRbMD ivc pMjwbI DunI-ivauNq shwiek is`D huMdI hY[</p> <p>7. swfy smwj ivclIAW GtnvwW, clMq mwmilAW qoN jwxU krwauNx leI inbMD rcnw ividAwrQI leI lwhyvMd swibq huMdI hY[</p>
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**bI. kwm, Bwg-pihlw smYstr-dUjw/B.Com-I, Sem-II**

वेरस वेड	वेरसदा नं	pMjwbI BwSw dy igAwn vrDk is`ty
BCOM 204	पंजाबी लाजमी	<p>1. ividAwrQIAW nUM vwrqk pVHwauX dw mUl mMqv smkwlI vwrqk qoN jwxU krwauXw hI nhIN sgoN auhnW nUM smkwl ivc c`l rhy ivcwr pRvwh qoN jwxU krauNxw vI hY[</p> <p>2. ieh lyK smkwlI icMqn dy v`K-v`K pswrW nUM pyS krDy hn, ijs nwl ividAwrQI dy mwnisk p`Dr dw ivkws hUMdw hY[</p> <p>3. mnu~K dIAW ivvhwirk loVw nUM mu`K r`Kdy hoey , ividAwrQI leI ic`TI-p`qr dI jwxkwrI lwBdwiek swibq huMdI hY[</p> <p>4. pMjwbI dIAW v`K-v`K KyqrW dIAW aup-BwSwvW pVHx qoN bwAd ividAwrQI nUM AwpxI mwq-BwSw dI AmIr SbdwvlI bwry vI soJI pRwpq huMdI hY[</p> <p>5. ividAwrQIAW nUM smkwl ivc cl rhy vwrqk dy v`K-v`K sMdrBW bwry igAwn aupl`bD krwauNx dy nwl-nwl auhnW nUM ApXI AmIr ivrwsq nUM pCwnx Aqy auhnW dI soc nUM ivSwl krn ih`q Aihm Xogdwn pwvygI[</p>

**bI. kwm Bwg- ਦੁਜਾ/B.Com-II**  
**sYSn 2019-20**

**bI.kwm Bwg dUjw, smYstr- qIjw/B.Com-II, Sem-III**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	ਪ੍ਰਮੁੱਖ ਬਿੰਦੂਆਂ ਦਾ ਸੰਖੇਪ ਵਰਣਨ
BCOM 303	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ਆਮ ਤੌਰ 'ਤੇ ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਆਮ ਤੌਰ 'ਤੇ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ। ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ।</p> <p>2. ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ। ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ।</p> <p>3. ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ। ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ।</p> <p>4. ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ। ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ।</p>

**ਬੀ.ਕਮ ਬਿਊਰੋ ਸਟਰੀਕੋਗ੍ਰਾਫੀ/ਬੀ.ਕਮ-II, ਸੈਮ-IV**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	ਪ੍ਰਮੁੱਖ ਬਿੰਦੂਆਂ ਦਾ ਸੰਖੇਪ ਵਰਣਨ
BCOM 405	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ। ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ।</p> <p>2. ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ। ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ।</p> <p>3. ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ। ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ।</p> <p>4. ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ। ਇਹ ਮਨੁੱਖੀ ਵਿਕਾਸ ਦੀ ਸਹੂਲਤਾਂ ਨੂੰ ਵਧਾਉਣ ਲਈ ਵਰਤਿਆ ਜਾਂਦਾ ਹੈ।</p>

		pYdw krDw hY[
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**bI.kwm Bwg qIjw/B.Com-III**

**sYSn 2019-20**

**bI.kwm Bwg qIjw, smYstr pMjvW/B.Com-III, Sem-V**

वेरम वेड	वेरमसा नां	pMjwbI BwSw dy igAwn vrDk is`ty
BCOM 505	पंजाबी लाजमी	<p>1. ies pwTkRm dw audyS ividAwrQIAW nUM nwl ivDw rwhIN smwjk qOr qy cyqMn krnw Aqy izMdgI ijaux dw bl pYdw krnw hY[</p> <p>2. ivAwkrn vwly Bwg nwl ividAwrQI nUM BwSw dI vwk bxqr Aqy kuSl sMcwr krn dy Xog bxwauXw hY[</p> <p>3. ies pwTkRm nwl ividAwrQIAW AMdr pMjwbI swihq pVn dI rucI pYdw huMdI hY Aqy auhnW AMdr rcnwqmk rucIAW pYdw huMdIAW hn[</p> <p>4. ies pwTkRm iv`c l`gy nwl dw AiDAYn ividAwrQI nUM smwj ivcly AxgOly ikrdwrW nwl rUbrU krwky icMqnSIl bxwauNdw hY[</p> <p>5. ieh pwTkRm nw kyvl ividAwrQI nUM mwq BwSw nwl joVdw hY blikausdymn AMdr mwq BwSw pRqI siqkwr pYdw vI krDw hY[</p> <p>6. ieh pwTkRm ividAwrQI dI kuSl lyKxI, BwSw dy Su`D aucwrn iv`c mddgwr swibq huMdw hY[</p>

**bI. kwm Bwg- qIjw, smYstr- CyvW/B.Com-III, Sem-VI**

वेरम वेड	वेरमसा नां	pMjwbI BwSw dy igAwn vrDk is`ty
BCOM 605	पंजाबी लाजमी	<p>1. ies pwTkRm dw audyS AwDuink iviSSt iv`idAw pRwpq krDy ividAwrQIAW nUM lokDwrw dw AiDAYn krwky auhnW nUM auhnW dy ivrsy Aqy Drwql nwl joVnw hY[</p> <p>2. lokDwrweI vrqwirAW bwry mu`FlI jwxkwrI nwl</p>

		<p>ividAwrQI nUM Awpxy Awly- duAwly pRqI ausdI ijMmyvvrI dw boD huMdw hY[</p> <p>3. ies pwTkRm dy nwl ividAwrQI nw kyvl Awpxy Drwql Aqy ivrsy pRqI jwxUM huMdw hY blik aus AMdr Awpxy s`iBAwcwr pRqI siqkwrq Bwvnr vI pYdw huMdI hY[</p> <p>4. ivSvIkRn dy v`Ddy pswr nUM dyKidAW ieh pwTkRm ividAwrQIAW nUM mwq BwSw dy Anuvwdk dy rUp ivc is`iKq krdr hY[</p> <p>5. ivAwkrn dw AiDAYn ividAwrQI nUM BwSw dI kuSl vrqoN krn dy Xog bxwauNdw hY[</p>
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**bI. ey. AY~&, Bwg-pihlw/ B.A.F.,-I  
sYSn 2019-20**

**bI. ey. AY~&, Bwg-pihlw, smYstr-pihlw/B.A.F.-I, Sem-I**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
<b>BAF 101</b>	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ies pwTkRm dw mnorQ ividAwrQIAW nMU pMjwbI swihq pVHn dI jwg lwauxw, aunHW AMdr rcnwqmk rucIAW pYdw krnw Aqy AwDuink smwj ivc PYly ivroDW, ivsMgqIAW qy qxwvW nMU Gtwauxw hY [</p> <p>2. mwq BwSw dy iviBMn p`KW dw AiDAYn ividAwrQIAW nMU aucyrI is`iKAw gRihx krn leI pRyirq krdr Aqy mwq BwSw dI AmIrI Aqy mh`qqw dw igAwn idMdw hY[</p> <p>3. pMjwbI BwSw Aqy DunIAW dw AiDAYn ividAwrQIAW nUM pMjwbI aup-BwSwvW dI v`Krqw Aqy sWJ bwry rOck jwxkwrI idMdy hoey tkswlI BwSw bwry igAwn pRdwn krdr hY[</p> <p>4. mnu`K dIAW ivvhwrk loVW nMU mu`K r`Kdy hoey ic`TI-p`qr nMU ies pwTkRm ivc r`iKAw igAw hY[</p> <p>5. ies pwTkRm dw mnorQ ividAwrQIAW nUM clMq mwmilAw bwry sucyq krnw Aqy smkwl dy pRmu`K srokwrW bwry cyqMn Aqy icMqnSIl bxwaudw hY, qW jo ividAwrQI cMgyrw smwj isrjx ivc shwiek</p>

		ho skx[ 6. ividAwrQI nMU pMjwbI DunIAW svr Aqy ivAMjn nMU dw shI boD hovygw Aqy aus dI BwSw dw Tik pRXog jo skygw[
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**bI.AYs.sI (mYfI., nwn-mYfI, sI.AYs.AY`m) / B. Sc. (Med., non-Med, C.S.M.)**

**ਸੈਸ਼ਨ- 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਇਸ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI.AYs.sI (mYfI, nwn-mYfI, sI.AYs.AYm) pws krn auprMq**

1. ieh ivSw ividAwrQIAW dI srbp`KI s^SIAq auswrI leI swrQk hY [
2. ieh ivSw ividAwrQIAW leI v`K-v~K mukwblydIAW pRIiKAwvW dy Xog bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ividAwrQI/jigAwsU nUM BwSw, swihq, klw Aqy siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [
5. ieh ivSw ividAwrQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl ies mSInI Xu`g vwLI qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw krDw hY [
6. ieh ivSw ividAwrQIAW nUM pMjwbI BwSw Aqy gurmuKI ilpI ivc inpuMn bxwaudw hY [
7. ieh ivSw ividAwrQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry sMvydnSIl bxwaudw hY[

**bI.AYs.sI (mYfI., nwn-mYfI, sI.AYs.AY`m) Bwg -pihlw, smYstr-pihlw/B. Sc. (Med., non- Med, C.S.M.)-I, Sem-I**

<b>ਕੋਰਸ ਕੋਡ</b>	<b>ਕੋਰਸਦਾ ਨਾਂ</b>	<b>pMjwbI BwSw dy igAwn vrDk is`ty</b>
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BSM/ BSNM/ BSCSM 104	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ies pwTkRm dw mnorQ ividAwrQIAW nMU pMjwbI swihq pVHn dI jwg lwauxw, aunHW AMdr rcnwqmk rucIAW pYdw krnw Aqy AwDuink smwj ivc PYly ivroDW, ivsMgqIAW qy qxwvW nMU Gtwauxw hY [</p> <p>2. mwq BwSw Aqy khwxI ivDw dy iviBMn p`KW dw AiDAYn ividAwrQIAW nMU aucyrI is`iKAw gRihx krn leI pRyirq krw Aqy ividAwrQI dI S^sIAq auswrI leI swrQk hY[</p> <p>3. pMjwbI BwSw Aqy DunIAW dw AiDAYn ividAwrQIAW nUM pMjwbI aup-BwSwvW dI v`Krqw Aqy sWJ bwry rOck jwxkwrI idMdy hoey tkswlI BwSw bwry igAwn pRdwn krw hY[</p> <p>4. mnu`K dIAW ivvhwrk loVW nMU mu`K r`Kdy hoey ic`TI-p`qr nMU ies pwTkRm ivc r`iKAw igAw hY[</p> <p>5. ies pwTkRm dw mnorQ ividAwrQIAW nUM clMq mwmilAw bwry sucyq krnw Aqy smkwl dy pRmu`K srokwrW bwry cyqMn Aqy icMqnSIl bxwaudw hY, qW jo ividAwrQI cMgyrw smwj isrjx ivc shwiek ho skx[</p>
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**bI.AYs.sI (mYfI., nwn-mYfI, sI.AYs.AY`m) smYstr -dUjw/**

**B. Sc. (Med., non- Med, C.S.M.)-I,Sem-II**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
BSM/ BSNM/ BSCSM 204	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ividAwrQIAW nUM pMjwbI vwrqk swihq pVwaux dw mnorQ auhnW AMdr auswrU ivcwr pYdw krnw Aqy aunHW nUM icMqnSIl bxwauxw hY [</p> <p>2. pMjwbI BwSw Aqy DunIAW dw AiDAYn ividAwrQIAW nUM BwSw dw Su`D aucwrx Aqy Su`D lyKx ivDI ivc shwiek hovygw[</p>

		<p>3. lok myly Aqy iqauhwrW sMbMDI AiDAYn  ividAwrQIAW nUM Awpxy siBAwcwr Aqy lokDwrw  bwry Axm`ulI jwxkwrI dyx dy nwl-nwl auhnW  AMdr svY-mwx jgwauNdw hY[</p> <p>4. ieh pwTkRm ividAwrQIAW nUM smkwl dy pRmu`K  srokwrW bwry cyqMn Aqy icMqnSIl bxwaudw hY,  qW jo ividAwrQI cMgyrw smwj isrjx ivc shwiek  ho skx[</p>
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**bI.AYs.sI (mYfI., nwn-mYfI, sI.AYs.AY`m) Bwg -dUjw/**

**B. Sc. (Med., non- Med, C.S.M.)-II**

**sYSn 2019-20**

**bI.AYs.sI (mYfI., nwn-mYfI, sI.AYs.AY`m) - dUjw, smYstr-qIjw/**

**B. Sc. (Med., non- Med, C.S.M.)-II, Sem-III**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
BSM 305 BSNM305 BSCSM 307	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. pMjwbI swihq dw rUp nwtk ividAwrQI-mn dw  ivrycn krdy hoey, a`ucqm jIvn jWc isKwauNdw  hY [</p> <p>2. nwtk ividAwrQIAW AMdr klpnw dy AMS pYdw  krky smwijk XQwrQ nwl joVdw hY [</p> <p>3. gurmuKI il`pI dw ieiqhws ividAwrQIAW nUM  BwSw ilKx dy smr`Q Aqy mnu`KI BwSw dy  ieiqhws nUM smJx ivc pRmu`K rol Adw krdw hY  [</p> <p>4. muhwvirAW dw AiDAYn ividAwrQIAW dI ivvhwrk  igAwn ivc vwdw krdw hY [</p> <p>5. mUl ivAwkrn iekweIAW ividAwrQIAW nUM  pMjwbI ivAwkrn dy nym-pRbMDW qoN jwxU  krvwauNdIAW hn[</p> <p>6. swihq ividAwrQI ivc pVHn dI rucI nUM vDyry</p>

		<p>pRcMf krdw hY[</p> <p>7. ieh pwTkRm ividAwrQIAW nUM smkwl dy pRmu`K srokwrW bwry cyqMn Aqy icMqnSIL bxwaudw hY, qW jo ividAwrQI cMgyrw smwj isrjx ivc shwiek ho skx[</p>
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**bI.AYs.sI (mYfI, nwn-mYfI, sI.AYs.AYm) Bwg-dUjw, smYstr cOQw/**

**B. Sc. (Med., non- Med, C.S.M.)-II, Sem-IV**

वेरस वेड	वेरसदा नं	pMjwbI BwSw dy igAwn vrDk is`ty
BSM 405 BSNM405 BSCSM 407	पंजाबी लल्लमी	<p>1. smkwlI pMjwbI kivqw smkwl dIAW iviBMn DwrwvW pRqI cyqMnqw pRdwn krdI hoeI ividAwrQI nUM sm`isAwvW nwl jUJx dI smr`Qw Aqy ijMdgI ijaUx leI suhj pYdw krdI hY [</p> <p>2. smkwlI pMjwbI kivqw sMgRih dy mwiDAm rwhIN ividAwrQI nUM swihq pVHn dI lgn lwauxw Aqy ies pwTkRm dw mnorQ smwj ivc ikqwb siBAwcwr pYdw krnw hY[</p> <p>3. ividAwrQIAW nUM pMjwbI BwSw dy nym pRbMDw qoN jwxU krvwuxw hY [</p> <p>4. ividAwrQIAW siBAwcwr dy sMklp nUM smJdy hoey siBAk smwj dI isrjxw kr skx[</p>

**bI.AYs.sI (mYfI, nwn-mYfI, sI.AYs.AYm) Bwg- qIjw/**

**B. Sc. (Med., non- Med, C.S.M.)-III**

**sYSn 2019-20**

**bI.AYs.sI (mYfI, nwn-mYfI, sI.AYs.AYm) Bwg-qIjw, smYstr pMjvW/**

**B. Sc. (Med., non- Med, C.S.M.)-III, Sem-V**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
BSM 505 BSNM505 BSCSM 507	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. nwvl ividAwrQIAW nUM smwijk qOr qy cyqMn krwd hY Aqy KUbsUrq izdgI ijaUNx dw bl bKSdw hY[</p> <p>2. pwTkRm ivclw nwvl `eyhu hmwrw jIvwx' jwgIrdwrI smwj ivc AOrq dI siQqI bwKUbI pyS krwd hY[</p> <p>3. pMjwbI BwSw Aqy DunIAW dw AiDAYn ividAwrQIAW nUM BwSw dI Su`Dqw, aucwrx dy p`Dr qy Aqy lyKx dy p`Dr qy inpuMn bxwauwx hY[ pMjwbI BwSw dy kyNdrI rUp Aqy aus ivc Aw rhIAW qbdIliAW Aqy BwSw dy v`Kry-v`Kry rUpW bwry jwxkwrI dyxw hY [</p> <p>4. ies pwTkRm dw mnorQ ividAwrQIAW nUM pMjwbI swihq pVHx dI jwg lwauwx Aqy auhnW AMdr rcnwqmk rucIAW pYdw krnw hY[</p>

**bI.AYs.sI (mYfI, nwn-mYfI, sI.AYs.AYm) Bwg-qIjw, smYstr CyvW/**

**B. Sc. (Med., non- Med, C.S.M.)-III, Sem-VI**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
BSM 605 BSNM605 BSCSM 607	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ieh pwTkRm pMjwbI lokDwrw dw inkt AiDAYn krwv ky ausdy v`Kry-v`Kry p`KW nUM aujwgr krwd Aqy Awpxy mwx-m`qy ivrsy pRqI siqkwr dI Bwvnrw pYdw krwd hY[</p> <p>2. lokDwrweI vrqwirAW bwry mu`FlI jwxkwrI dy ky ividAwrQI nUM Apxy-Awly duAwly pRqI ausdI ijMmyvwrI dw boD krwvauNdw hY[</p> <p>3. ivSvIkrn dy v`Ddy pswr nUM dyKidAW ieh</p>

		<p>pwTkRm ividAwrQIAW nUM v`KrIAW-v`KrIAW  BwSwvW dy igAwn Aqy Anuvwd krn dy smr`Q  bxwauNdw hY[</p> <p>4. ieh pwTkRm ividAwrQIAW nUM mwq-BwSw dy  nymW sMbMDI jwgrUk krwd hY Aqy sMcwr leI  ausdy vwk boD nUM inKwrwd Aqy aus AMdr  sliKw pYdw krwd hY[</p>
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**bI. ey. jy. AY~m. sI, Bwg-pihlw/**

**B.A.J.M.C.- I**

**sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਇਸ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI. ey. jy. AY~m. sI. pws krn auprMq**

1. ieh ivSw ividAwrQIAW dI srbp`KI s^SIAq auswrI leI swrQk hY [
2. ieh ivSw ividAwrQIAW leI v`K-v~K mukwblydIAW pRIiKAww dy Xog bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ividAwrQI/jigAwsU nUM BwSw, swihq, klw Aqy siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [
5. ieh ivSw ividAwrQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl ies mSInI Xu`g vwlI qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw krwd hY [
6. ieh ivSw ividAwrQIAW nUM pMjwbI BwSw Aqy gurmuKI ilpI ivc inpuMn bxwaudw hY [
7. ieh ivSw ividAwrQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry sMvydnSIl bxwaudw hY[

**bI. ey. jy. AY~m. sI, Bwg-pihlw, smYstr-pihlw/ B.A.J.M.C.-I, Sem-I**

<b>ਕੋਰਸ ਕੋਡ</b>	<b>ਕੋਰਸਦਾ ਨਾਂ</b>	<b>pMjwbI BwSw dy igAwn vrDk is`ty</b>
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BAJMC 101	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ies kors iv`c l`gI pusqk `coxvyN pMjwbI inbMD', pMjwbI swihq dy mhwn swihqkwrW dy ivcwrW qoN jwxU krvwauNdw hY[</p> <p>2. `kwiv-kMjkw' pusqk rwhIN smwj iv`c nwrI dI vfm`ulI BUimkw pRqI sMvydnSI l bxwauNdw hY[</p> <p>3. ividAwrQIAW nMU pMjwb dIAW aupBwSwvW Aqy aunHW dIAW ivl`KqvwW qoN jwxU krvwieAw jWdw hY[</p> <p>4. pMjwbI BwSw dI muhwrq hwisl krn leI SuD BwSw vrqoN-ivhwr pRqI jwxU krvwauNdw hY[</p> <p>5. ividAwrQI nMU AwauNdy smyN d&amp;qrI kwrj leI iqAwr krn leI p`qr, ic`TI-p`qr ilKx dy kwibl bxwauNdw hY[</p> <p>6. ies kors dw mnorQ ividAwrQI nMU AwpxI BwSw, smwj, BUgoilk ivrsy dIAW iviBMn ivSySqvwW, gOrvmeI ieiqhws Awid KyqrW dI jwxkwrI idMidAW ienHW iv`coN smwijk srokwrW nMU shI pirpyK iv`c smJx Aqy icMqn krn Xog bxwauNdw hY[</p> <p>7. ies dy nwl hI BwSw dw shI aucwrx, DunIAW/BwSw dI kuSlqwpUvk vrqoN krn dy Xog bxwauNdw hY[</p>
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**bI. ey. (Awnrz AMgryzI) Bwg-pihlw**

**B.A. (Eng Hon's)-I**

**sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਇਸ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI. ey. (Awnrz AMgryzI) pws krn auprMq**

1. ieh ivSw ividAwrQIAW dI srbp`KI s^SIAq auswrI leI swrQk hY [
2. ieh ivSw ividAwrQIAW leI v`K-v~K mukwblydIAW pRIiKAww dy Xog bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ividAwrQI/jigAwsU nUM BwSw, swihq, klw Aqy siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [
5. ieh ivSw ividAwrQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl ies mSInI Xu`g vwI qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw krdw hY [
6. ieh ivSw ividAwrQIAW nUM pMjwbI BwSw Aqy gurmuki ilpI ivc inpuMn bxwaudw hY [
7. ieh ivSw ividAwrQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry sMvydnSIl bxwaudw hY[

**bI. ey. (Awnrz AMgryzI) Bwg-pihlw, smYstr-pihlw/B.A. (Eng Hon's)-I, Sem-I**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸ ਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
BAHENG 203	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ies pwTkRm dw mnorQ ividAwrQIAW nMU pMjwbI swihq pVHn dI jwg lwauXw, aunHW AMdr rcnwqmK rucIAW pYdw krnw Aqy AwDuink smwj ivc PYly ivroDW, ivsMgqIAW qy qxwvW nMU GtwauXw hY [</p> <p>2. mwq BwSw dy iviBMn p`KW dw AiDAYn ividAwrQIAW nMU aucyrI is`iKAw gRihx krn leI pRyirq krdw Aqy mwq BwSw dI AmIrI Aqy mh`qqw dw igAwn idMdw hY[</p>

		<p>3. pMjwbI BwSw Aqy DunIAW dw AiDAYn  ividAwRQIAW nUM pMjwbI aup-BwSwvW dI  v`Krqw Aqy sWJ bwry rOck jwxkwrI idMdy  hoey tkswlI BwSw bwry igAwn pRdwn krdw hY[</p> <p>4. mnu`K dIAW ivvhwrk loVW nMU mu`K r`Kdy  hoey ic`TI-p`qr nMU ies pwTkRm ivc r`iKAw  igAw hY[</p> <p>5. ies pwTkRm dw mnorQ ividAwRQIAW nUM clMq  mwmilAw bwry sucyq krnw Aqy smkwI dy  pRmu`K srokwrW bwry cyqMn Aqy icMqnSIL  bxwaudw hY, qW jo ividAwRQI cMgyrw smwj  isrjx ivc shwieK ho skx[</p>
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**bI. ey. (Awnrz ieknwimks) Bwg-pihlw/**

**B.A. (Eco. Hon's)-I**

**sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਇਸ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI. ey. (Awnrz ieknwimks) pws krn auprMq**

1. ieh ivSw ividAwRQIAW dI srbp`KI s^SIAq auswrI leI swrQk hY [
2. ieh ivSw ividAwRQIAW leI v`K-v~K mukwblydIAW pRIiKAwvW dy Xog  
bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ividAwRQI/jigAwsU nUM BwSw, swihq, klw Aqy  
siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [

5. ieh ivSw ividAwRQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl ies mSInI Xu`g vwlI qxwE pUrn ijMdGI nwl jUJx dI smr`Qw pYdw krdw hY [

6. ieh ivSw ividAwRQIAW nUM pMjwbI BwSw Aqy gurmUKI ilpI ivc inpuMn bxwaudw hY [

7. ieh ivSw ividAwRQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry sMvydnSIl bxwaudw hY[

**bI. ey. (Awnrz ieknwimks) Bwg-pihlw, smYstr-pihlw/ B.A. (Eco Hon's)- I,Sem-I**

वेरम वेड	वेरम दानं	pMjwbI BwSw dy igAwn vrDk is`ty
BAHECO 103	पंजाबी लल्लमी	<p>1. ies pwTkRm dw mnorQ ividAwRQIAW nMU pMjwbI swihq pVHn dI jwg lwauXw, aunHW AMdr rcnwqmk rucIAW pYdw krnw Aqy AwDuink smwj ivc PYly ivroDW, ivsMgqIAW qy qxwvW nMU GtwauXw hY [</p> <p>2. mwq BwSw dy iviBMn p`KW dw AiDAYn ividAwRQIAW nMU aucyrI is`iKAw gRihx krn leI pRyirq krdw Aqy mwq BwSw dI AmIrI Aqy mh`qqw dw igAwn idMdw hY[</p> <p>3. pMjwbI BwSw Aqy DunIAW dw AiDAYn ividAwRQIAW nUM pMjwbI aup-BwSwvW dI v`Krqw Aqy sWJ bwry rOck jwxkwrI idMdy hoey tkswlI BwSw bwry igAwn pRdwn krdw hY[</p> <p>4. mnu`K dIAW ivvhwrk loVW nMU mu`K r`Kdy hoey ic`TI-p`qr nMU ies pwTkRm ivc r`iKAw igAw hY[</p> <p>5. ies pwTkRm dw mnorQ ividAwRQIAW nUM clMq mwmilAw bwry sucyq krnw Aqy smkwl dy</p>

		pRmu`K srokwrW bwry cyqMn Aqy icMqnSIl bxwaudw hY, qW jo ivedAwrQI cMgyrw smwj isrjx ivc shwiek ho skx[
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**bI AYs sI AYgrIklcr Bwg pihlw/**

**B.Sc. Agriculture- I**

**sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਇਸ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI.AYs. sI. AYgrIklcr pws krn auprMq :**

1. ieh ivSw ivedAwrQIAW dI srbp`KI s^SIAq auswrI leI swrQk hY [
2. ieh ivSw ivedAwrQIAW leI v`K-v~K mukwblydIAW pRIiKAwvW dy Xog  
bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ivedAwrQI/jigAwsU nUM BwSw, swihq, klw Aqy  
siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [
5. ieh ivSw ivedAwrQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl  
ies mSInI Xu`g vwli qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw  
krdw hY [
6. ieh ivSw ivedAwrQIAW nUM pMjwbI BwSw Aqy gurmuki ilpI ivc  
inpuMn bxwaudw hY [
7. ieh ivSw ivedAwrQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry  
smvydnSIl bxwaudw hY[

**bI. AYs. sI. AYgrIklcr Bwg pihlw, smYstr-pihlw/B.Sc. Agriculture- I, Sem-I**

<b>ਕੋਰਸ ਕੋਡ</b>	<b>ਕੋਰਸ ਦਾ ਨਾਂ</b>	<b>pMjwbI BwSw dy igAwn vrDk is`ty</b>
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<b>BSHAG</b>	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ies pwTkRm dw mnorQ ividAwrQIAW nMU pMjwbI swihq pVHn dI jwg lwauxw, aunHW AMdr rcnwqm k rucIAW pYdw krnw Aqy AwDuink smwj ivc PYly ivroDW, ivsMgqIAW qy qxwvW nMU Gtwauxw hY [</p> <p>2. mwq BwSw dy iviBMn p`KW dw AiDAYn ividAwrQIAW nMU aucyrI is`iKAw gRihx krn leI pRyirq krw Aqy mwq BwSw dI AmIrI Aqy mh`qqw dw igAwn idMdw hY[</p> <p>3. BwSw dIAW Sbd SRyxIAW dw AiDAYn ividAwrQIAW dI sDwrn bolcwl nUM Su`D Aqy pRBwvSwlI bxwauNdw hY[</p> <p>4. ies pwTkRm dw mMqv ividAwrQIAW nUM swihq nwl joVn qoN ielvwv auhnW nUM BwSweI p`Dr 'qy inpuMn bxwauxw vI hY[</p> <p>5. ies pwTkRm dw mnorQ ividAwrQIAW nUM clMq mwmilAW bwry sucyq krnw Aqy smkwl dy pRmu`K srokwrW bwry cyqMn Aqy icMqnSIl bxwaudw hY, qW jo ividAwrQI cMgyrw smwj isrjx ivc shwiek ho skx[</p>
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**bI. AYs. sI. AYgrIklcr Bwg- pihlw smYstr-dUjw/ B.Sc. Agriculture- I, Sem- II**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸ ਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
<b>BSHAG</b>	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. iekWgI ividAwrQIAW nUM mnorMjk FMg nwl ijMdgI dy v`K-v`K pihLUAW dI soJI pRdwn krw hY[</p> <p>2. iekWgI iek swrQk ibMb isrj ky ividAwrQI mn dI rcnwqimkqw nUM pRPu`lq krw hY[</p> <p>3. muhwvirAW dI vrqoN boli nUM iSMgwrDI, sMvwrDI qy pRBwvSwlI bxwauNdI hY[ iehnW</p>

		<p>dI vrqoN nwl ividAwRQI QoVyH SbdW ivc bhuqW kuJ kihx dI jWc is~Kdy hn[</p> <p>4. ies pwTkRm dw mMqv AwDuink Xu`g dy mnu`K dy AMdr-bwhr PYly-ivroDW, ivsMgqIAW qy GtnwvW nUM nwtk ivDw rwhI isiKAq krnw hY[ ikauik swihq dI nwtk ivDw dw mnu`K dI smwijk ivDw nwl Aiq nyVlw sMbMD hY [</p> <p>5. AMgryzI qoN pMjwbI Anuvwd nUM pwTkRm iv`c Swml krn nwl ividAwRQIAW leI AMgRyzI BwSw sMbMDI bhuq swry kiTn Sbd bVy suKwly bx jWdy hn qy ivhwrk p`Dr `qy auhnW dy kMm AwauNdy hn[</p>
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**bI.vokySnI nrsrI mYnyjmYnt Bwg-pihlw/**

**B. Voc. Nursery management- I**

**sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਇਸ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI.vokySnI nrsrI mYnyjmYnt /bI.vok PUF. pRosYisMg pws krn auprMq**

1. ieh ivSw ividAwRQIAW dI srbp`KI s^SIAq auswrI leI swrQk hY [
2. ieh ivSw ividAwRQIAW leI v`K-v~K mukwblydIAW pRIiKAww dy Xog  
bxwauNdw hY[
3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[
4. mwq-BwSw dw ieh ivSw ividAwRQI/jigAwsU nUM BwSw,swihq,klw Aqy  
siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [

5. ieh ivSw ividAwrQIAW nUM cyqMn Aqy icMqnSIl bxwaux dy nwl-nwl ies mSInI Xu`g vwlI qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw krdw hY [

6. ieh ivSw ividAwrQIAW nUM pMjwbI BwSw Aqy gurmUKI ilpI ivc inpuMn bxwaudw hY [

7. ieh ivSw ividAwrQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry sMvydnSIl bxwaudw hY[

**bI.vokySnl nrsrI mYnyjmYnt Bwg-pihlw, smYstr pihlw/**

**B. Voc. Nursery management- I, Sem- I**

वेरस वेड	वेरस दानं	pMjwbI BwSw dy igAwn vrDk is`ty
BVNM 106	पंजाबी ललामी	<p>1. ies pwTkRm dw mnorQ ividAwrQIAW nMU pMjwbI swihq pVHn dI jwg lwauxw, aunHW AMdr rcnwqmk rucIAW pYdw krnw Aqy AwDuink smwj ivc PYly ivroDW, ivsMgqIAW qy qxwvW nMU Gtwauxw hY [</p> <p>2. ivAwkrn dy iviBMn- iviBMn p`KW dw AiDAYn ividAwrQIAW nMU BwSw ivc muhwrq hwisl krn Aqy aucyrI is`iKAw gRihx krn leI pRyirq krdw hY[</p> <p>3. mwq-BwSw dw igAwn BwSw dI AmIrI Aqy mh`qqw nUM aujwgr krdw hY[</p> <p>4. islybs ivc drz pusqk `kQw-rMg' duy mwiDAm rwhIN ividAwrQIAW nUM smwj ivc &amp;Yl rhy durwcwr Aqy smwj nUM drpyS sm`isAvW nwl sMbMiDq iviSAw bwry sucyq krnw Aqy icMqnSIl bxwauxw hY[</p> <p>5. ivSy nwl sMbMiDq qknIKI SbdwvLI ividAwrQI nMU AwauNdy jIvn iv`c swDwrx jn-jIvn nwl vrqoN-ivhwr krn dy kwibl bxwauxw hY[</p>

		6. swfy smwj ivclIAW GtnwvW, clMq mwmilAW qoN jwxU krvwauNx leI inbMD rcnw ividAwrQI leI lwhyvMd swibq huMdI hY[
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**bI.vok PUF. pRosYisMg Bwg-pihlw/**

**B. Voc. Food Processing- I**

**sYSn 2019-20**

**pMjwbI BwSw dy igAwn vrDk is`ty**

**audyS :**

ਇਸ ਕੋਰਸ ਵਿੱਚ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਦਾ ਵਿਸ਼ਾ ਪੜ੍ਹਨ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀ ਸਾਹਿਤ ਲਿਖਣ- ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਸਖ਼ਸ਼ੀਅਤ, ਸਮਾਜ ਅਤੇ ਹੋਰ ਬਹੁਪੱਖੀ ਵਿਚਾਰਧਾਰਵਾਂ ਬਾਰੇ ਜਾਣਨ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ ।

**bI.vok PUF. pRosYisMg pws krn auprMq**

1. ieh ivSw ividAwrQIAW dI srbp`KI s^SIAq auswrI leI swrQk hY [

2. ieh ivSw ividAwrQIAW leI v`K-v~K mukwblydIAW pRIiKAwvW dy Xog  
bxwauNdw hY[

3. ies ivSw ivc pVHwey jWdy ivSy aucyrI is`iKAw leI ADwr bxdy hn[

4. mwq-BwSw dw ieh ivSw ividAwrQI/jigAwsU nUM BwSw, swihq, klw Aqy  
siBAwcwr nwl joV ky a~ucqm jIvn jWc isKwauNdw hY [

5. ieh ivSw ividAwrQIAW nUM cyqMn Aqy icMqnSIl bxwauX dy nwl-nwl  
ies mSInI Xu`g vwlI qxwE pUrn ijMdgI nwl jUJx dI smr`Qw pYdw  
krdw hY [

6. ieh ivSw ividAwrQIAW nUM pMjwbI BwSw Aqy gurmuki ilpI ivc  
inpuMn bxwaudw hY [

7. ieh ivSw ividAwrQIAW nUM qknwlojI dy Xu`g AMdr vI vDyry  
sMvydnSIl bxwaudw hY[

**bI.vok PUF. pRosYisMg Bwg pihlw, smYstr pihlw/ B. Voc. Food Processing-  
I, Sem-I**

ਕੋਰਸ ਕੋਡ	ਕੋਰਸ ਦਾ ਨਾਂ	pMjwbI BwSw dy igAwn vrDk is`ty
BVFP 111	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ	<p>1. ies pwTkRm ivclIAW khwxIAW ividAwrQIAW nUM smwijk srokwrW nwl joVdIAW hn Aqy auhnW dI S^sIAq iv`c inKwr vI ilAwauNdIAw hn[</p> <p>2. ieh pwTkRm ividAwrQIAW nUM smwijk ivsMgqIAW pRqI jwgrUk krky auhnW dy smwDwn pRqI is`iKAq krDw hY[</p> <p>3. DunI boD,vwk boD Aqy SbdW dI shI vrqoN ividAwrQI nUM ausdy sMcwr Aqy lyKxI leI igAwn pRdwn krdI hY[</p> <p>4. ic`TI-p`qr lyKxI ividAwrQI dIAW ivhwrk loVW iv`c shwiek is`D huMdI hY[</p> <p>5. ieh pwTkRm ividAwrQI nUM ausdy AwgwmI jIvn pRqI AMdrUnI Aqy bwhrI p`KoN is`iKAq krn iv`c Xogdwn pwauNdw hY [</p>

**Course Name: - GURMAT SANGEET**

<b>Course Code</b>	<b>Course B.A.Music (Gurmat sangeet)</b>	<b>Course Outcome</b>
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<b>BA-118</b>	<b>Paper-I (Theory)</b> <b>Paper-II (Practical)</b>	The student will be learning about: <ul style="list-style-type: none"> <li>• The student will be learning about the historical background, musical terms, role of Gurmat sangeet in human life.</li> <li>• The student will be able to learn about contribution of different musicologist in the field of Gurmat sangeet.</li> <li>• The students will also know about the different rags and taals, and how string instruments are used.</li> </ul>
<b>BA-218</b>	<b>Paper-I (Theory)</b> <b>Paper-II (Practical)</b>	The student will be learning about: <ul style="list-style-type: none"> <li>• The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music.</li> <li>• The students will also know about the different rags and taals, and how instruments are used</li> <li>• The students will be able to learn about the scientific and acoustic structure of musicology.</li> </ul>
<b>BA-318</b>	<b>Paper-I (Theory)</b> <b>Paper-II (Practical)</b>	The student will be learning about: <ul style="list-style-type: none"> <li>• The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music.</li> <li>• The students will also know about the different rags and taals, and how instruments are used.</li> <li>• The students will be able to learn about the importance of music in life.</li> </ul>
<b>BA-418</b>	<b>Paper-I (Theory)</b> <b>Paper-II (Practical)</b>	The student will be learning about: <ul style="list-style-type: none"> <li>• The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music.</li> <li>• The students will also know about the different rags and taals, and how instruments are used.</li> </ul>

		<ul style="list-style-type: none"> <li>• The students will be able to have the knowledge of various raags.</li> </ul>
<b>BA-518</b>	<b>Paper-I (Theory)</b> <b>Paper-II (Practical)</b>	<p>The student will be learning about:</p> <ul style="list-style-type: none"> <li>• The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music.</li> <li>• Further the students will also know about the different rags and taals, and how instruments are used.</li> <li>• The students will be able to know the different gharanas.</li> </ul>
<b>BA-618</b>	<b>Paper-I (Theory)</b> <b>Paper-II (Practical)</b>	<p>The student will be learning about:</p> <ul style="list-style-type: none"> <li>• The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music.</li> <li>• The students will also know about the different rags and taals, and how instruments are used.</li> <li>• The students will also know about the performance behavior.</li> </ul>

## Course Name: - MUSIC VOCAL

### Course Outcome:

Course Code	Course B.A. Music Vocal)	Course Outcome
BA-122	Paper I (Theory) Paper-II (Practical)	The student will be learning about: <ul style="list-style-type: none"><li>• The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of Indian classical music.</li><li>• The students will be able learn about the raag system of Indian classic music .</li><li>• The students will also learn the various gayan shellies prevailed in indain classical music.</li></ul>
BA-222	Paper I (Theory) Paper-II (Practical)	The student will be learning about: <ul style="list-style-type: none"><li>• The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music.</li><li>• Further the students will also know about the various ragas and talas which are mainly focused in Indian classical Music.</li></ul>
BA-322	Paper I (Theory) Paper-II (Practical)	The student will be learning about: <ul style="list-style-type: none"><li>• Students will gain skills in practical access as well as knowledge and understanding of scores and techniques of score reading.</li><li>• Students will gain basic performance skills and knowledge of pedagogical techniques in specific performance mediums.</li><li>• Students will gain a basic understanding of the use of</li></ul>

		technology in music and music education.
<b>BA-422</b>	<b>Paper I (Theory) Paper-II (Practical)</b>	<p>The student will be learning about:</p> <ul style="list-style-type: none"> <li>• Students will gain skills in conducting both instrumental and choral ensembles, as well as knowledge and understanding of scores and techniques of score reading.</li> <li>• Students will gain basic performance skills and knowledge of pedagogical techniques in specific performance mediums.</li> <li>• Students will gain a basic understanding of the use of technology in music and music education.</li> </ul>
<b>BA-522</b>	<b>Paper I (Theory) Paper-II (Practical)</b>	<p>The student will be learning about:</p> <ul style="list-style-type: none"> <li>• Music students will be able to perform as professional or will be prepared for entering graduate music study and for public school and studio teaching etc. in various fields of music.</li> <li>• Students will be able to create, analyze, and synthesize music as a means of supporting developing careers in music teaching and/or performance.</li> <li>• Students will be able to recognize, classify, and interpret a common body of western literature and individual repertory by written and oral means.</li> </ul>
<b>BA-622</b>	<b>Paper I (Theory) Paper-II (Practical)</b>	<p>The student will be learning about:</p> <p>The basic study of Indian classical Music along with historical study of Vocal Music.</p> <p>The different gayan shellies of Indian Classical Music.</p> <p>The knowledge about Notation system of Hindustani Music.</p> <p>The various singing styles of Indian classical music, semi-classical, folk music and shabad gayan in gurmat sangeet.</p>

<b>Course Code</b>	<b>Course B.A. Music Instrumental)</b>	<b>Course Outcome</b>
<b>BA-117</b>	<b>Paper I (Theory) Paper-II (Practical)</b>	<p>The student will be learning about:</p> <ul style="list-style-type: none"> <li>• The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music.</li> <li>• Further the students will also know about the different rags and taals, and how instruments are used.</li> <li>• The students will also know about the analytical study of raag system.</li> </ul>
<b>BA-217</b>	<b>Paper I (Theory) Paper-II (Practical)</b>	<p>The student will be learning about:</p> <ul style="list-style-type: none"> <li>• The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music.</li> <li>• Further the students will also know about the different rags and taals, and how instruments are used.</li> </ul>
<b>BA-317</b>	<b>Paper I (Theory) Paper-II (Practical)</b>	<p>The student will be learning about:</p> <ul style="list-style-type: none"> <li>• Students will gain skills in conducting both instrumental and choral ensembles, as well as knowledge and understanding of scores and techniques of score reading.</li> <li>• Students will gain basic performance skills and knowledge of pedagogical techniques in specific performance mediums.</li> <li>• Students will gain a basic understanding of the use of technology in music and music education.</li> </ul>
<b>BA-417</b>	<b>Paper-I (Theory) Paper-II (Practical)</b>	<p>The student will be learning about:</p> <ul style="list-style-type: none"> <li>• Students will gain skills in conducting both instrumental and choral ensembles, as well as knowledge and understanding of scores and techniques of score reading.</li> <li>• Students will gain basic performance skills and knowledge of pedagogical techniques in specific performance mediums.</li> <li>• Students will gain a basic understanding of the use of technology in music and music education.</li> </ul>

<b>BA-517</b>	<b>Paper-I (Theory) Paper-II (Practical)</b>	The student will be learning about: <p>Music students will be able to perform as soloists, ensemble members, and chamber musicians at appropriate levels for entering graduate music study and for public school and studio teaching.</p> <p>Students will be able to create, analyze, and synthesize music as a means of supporting developing careers in music teaching and/or performance.</p> <p>Students will be able to recognize, classify, and interpret a common body of western literature and individual repertory by written and oral means.</p>
<b>BA-617</b>	<b>Paper-I (Theory) Paper-II (Practical)</b>	The student will be learning about: <ul style="list-style-type: none"> <li>• About the basic study of Indian Music along with historical study of instrumental music.</li> <li>• About various VaadanShaillies.</li> <li>• The knowledge about Notation system of Hindustani Music.</li> </ul>

### **Course Name: Economics**

#### **Course Outcome: BA Economics**

<b>Course Code</b>	<b>Course</b>	<b>Course Outcome</b>
BA	Micro Economics and Indian Economy- I	Enables students to understand the basic concepts of Microeconomics along with the detailed description of Indian Economy since Independence.
BA	Micro Economics and Indian Economy-II	Provides the students with the detailed information about different forms of markets on one hand and introduces the students with Indian taxation system, foreign trade, problems and planning in Indian context
BA	Macroeconomics and Public Finance	helps students to understand the basic concepts of Macroeconomics and Public Finance
BA	Macroeconomics and International Trade	Enables students to get acquainted with Macroeconomic concepts and Trade Theory with special reference to Indian Economy.

BA	Economics of Development and Quantitative Methods-I	Helps students to understand the concepts and various theories related to growth and development along with introduction with the use of mathematical/statistical techniques in economic analysis
BA	Economics of Development and Quantitative Methods-II	Helps students to understand the concepts and various theories related to growth and development along with introduction with the use of mathematical/statistical techniques in economic analysis

### Course Name: Geography

**Course Outcome:**

Course Code	Course	Course Outcome
BA 110	Physical Geography-I:Geomorphology	After completing the course, the students will have ability to: <ol style="list-style-type: none"> <li>1. Understand the functioning of Earth systems in real time and analyze how the natural and anthropogenic operating factors affect the development of landforms.</li> <li>2. Distinguish between the mechanisms that control these processes.</li> <li>3. Assess the roles of structure, stage and time in shaping the landforms, interpret geomorphologic maps and apply the knowledge in geographical research.</li> </ol>
BA 110/P	Practical Geography: Cartography and Field Survey	After completing the course, the students will have ability to: <ol style="list-style-type: none"> <li>1. Read and prepare maps.</li> <li>2. Comprehend locational and spatial aspects of the earth surface.</li> <li>3. Use the apparatuses of chain tape survey.</li> </ol>
BA 210	Physical Geography II: Climatology and Oceanography	After completing the course, the students will have ability to:

		<ol style="list-style-type: none"> <li>1. Understand the elements of weather and climate and its impacts at different scales.</li> <li>2. Comprehend the climatic aspects and its bearing on planet earth.</li> <li>3. Understand the oceanic process and availability of resources.</li> </ol>
BA 210/P	Practical Geography: Cartography and Weather Maps	<p>After completing the course, the students will have ability to:</p> <ol style="list-style-type: none"> <li>1. Read and prepare maps.</li> <li>2. Comprehend locational and spatial aspects of the earth surface.</li> <li>3. Use and importance of maps for regional development and decision making.</li> </ol>
BA 310	Geography of Resources and Environment	<p>After completing the course, the students will have ability to:</p> <ol style="list-style-type: none"> <li>1. Understand the dynamic interactive relationship between man and environment.</li> <li>2. Have sound understanding on distribution, utilization and proper management of natural resources at global level.</li> <li>3. Make assessment and review of planning related to environment and natural resources.</li> </ol>
BA 310/P	Practical Geography: Cartography	<p>After completing the course, the students will have the ability to:</p> <ol style="list-style-type: none"> <li>1. Know the various techniques and methods of presentation of the data.</li> <li>2. Draw the Bars and Tables in quantitative research reports.</li> </ol>
BA 410	Geography of Punjab	<p>After completing the course, the students will have ability to:</p> <ol style="list-style-type: none"> <li>1. Know the physical divisions of the Punjab state, its area, land utilization, drainage, soils,</li> </ol>

		<p>etc.</p> <ol style="list-style-type: none"> <li>2. Know about all the districts and other sub-political divisions of the Punjab state.</li> <li>3. Know the distribution of different mineral and power resources of the Punjab state and they will suggest ways for their proper utilization.</li> <li>4. Know the different economic and geographic problems faced by their state and they will suggest the ways for its solutions.</li> </ol>
BA 410/P	Practical Geography: Cartography	<p>After completing the course, the students will have ability to:</p> <ol style="list-style-type: none"> <li>1. Know the conventional signs used on the topographical maps and they will easily read the maps for various purposes.</li> <li>2. Know the different type of the maps and their uses in various aspects of the life.</li> <li>3. Know the different units of measurement of the land and they will be able to draw a plan of any site with the help of Chain, Tape, Trough Compass, etc.</li> </ol>
BA 510	World Regional Geography	<p>After completing the course, the students will have ability to:</p> <ol style="list-style-type: none"> <li>1. Know the geographical location of all the continents on the earth.</li> <li>2. Know the distribution of the natural and human resources in the world.</li> <li>3. Be well prepared for the competitive exams.</li> </ol>
BA 510/P	Practical Geography: Map Projections	<p>After completing the course, the students will have ability to:</p> <ol style="list-style-type: none"> <li>1. Understand the concept of the Map Projections and types and importance of the Map Projections.</li> <li>2. Know how to make maps by using various Map Projections.</li> </ol>

BA 610	Geography of India	<p>After completing the course, the students will have ability to:</p> <ol style="list-style-type: none"> <li>1. Understand the physical profile of the country.</li> <li>2. Study the resource endowment and its spatial distribution and utilization for sustainable development.</li> <li>3. Synthesize and develop the idea of regional dimensions.</li> </ol>
BA 610/P	Practical Geography: Field Methods in Geography	<p>After completing the course, the students will have ability to:</p> <ol style="list-style-type: none"> <li>1. Appreciate the strength and application of remote sensing.</li> <li>2. Map the resources, their location and availability.</li> <li>3. Apply this knowledge for sustainable development</li> <li>4. Conduct proper field work for the collection of primary data to bring out grassroots realities.</li> <li>5. Make use of proper tools and surveying methods for measurement in context of collection and processing of data.</li> <li>6. Prepare a report based on field data.</li> </ol>

