

# Programme Outcome, Programme Specific Outcome and Course Outcome

Name of the Department: **BOTANY**

## **2014 - 2018 Admission (BSc Botany)**

### **Programme Outcomes**

Bachelor of Science (BSc) offers theoretical as well as practical knowledge about different subject areas. These subject areas include Physics, Chemistry, Mathematics and Biology and other fields depending on the specialisation a student opts. This programme course is most beneficial for students who have a strong interest and background in Science and Mathematics. The course is also beneficial for students who wish to pursue multi and interdisciplinary science careers in future. Following are the various programme outcomes:

1. This course forms the basis of science and comprises the subjects like physics, chemistry, biology, zoology and mathematics.
2. It helps 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.
3. After the completion of this course students have the option to go for higher studies i.e. M. Sc and then do some research for the welfare of mankind.
4. After higher studies students can join as scientists and can even look for professional job oriented courses.
5. This course also offers opportunities for serving in Indian Army, Indian Navy, Indian Air Force as officers.
6. Students after this course have the option to join Indian Civil Services as IAS, IFS etc..
7. Science graduates can go to serve in industries or may opt for establishing their own industrial unit.
8. After the completion of the B.Sc degree there are various other options available for the science students. Often, in some reputed universities or colleges in India and abroad the students are recruited directly by big MNC's after their completion of the course.

9. Apart from the research jobs, students can also work or get jobs in Marketing, Business & Other technical fields. Science graduates are also recruited in the bank sector to work as customer service executives. Students can also find employment in government sectors.

## Programme Specific Outcomes

The syllabus for B.Sc. programmes in Botany offer eighteen core courses including three practical courses, one elective and one project which could attain 54 credits. The theory core papers are of different credits. Each practical course consists of four credits. These eighteen core courses offered at the Undergraduate level are designed systematically maintaining the interrelationship between the courses intending the students to have a clear understanding of the subject matter. The study of the methodology of science helps the students to get a better classroom interaction in the core courses instead of relying on rote memory and knowledge. More over it promotes scientific attitude and scientific temper in students. A course on Data analysis in biology is incorporated in the beginning of the programme which promotes problem solving skills of the students which is required for their success in the core courses like genetics, molecular biology, environmental science, physiology, evolution and bioinformatics and for better understanding of various biological phenomena . An option is provided for the students to choose open courses from other departments in 5th and 6th semesters. Seminars, assignments, field survey, project, study tour etc.

## Course Outcome

Sl. No.	Name of Course (paper)	Outcomes	
<b>1</b>	<b>CORE COURSE -Theory I ENVIRONMENTAL SCIENCE AND PHYTOGEOGRAPHY</b>	<b>i</b>	1. To enable the students to understand the fundamentals of environmental science 2. To enable them to contribute meaningfully in the conservation of the environment. 3. To make them aware of the current global problems of the environment due to human intervention and the need of developing a sustainable way of life 4. To appreciate bio diversity and the importance of conservation strategies. 5. To make them aware of the global ecological crisis.
<b>2</b>	<b>CORE COURSE – Theory II ANGIOSPERM ANATOMY AND MICROTECHNIQUE</b>	<b>i</b>	1. To observe and differentiate the variations existing in the internal structure of plants. 2. To create interest in plant anatomy and to appreciate the function of a particular

		<p>tissue or organ correlated with its structure.</p> <p>3. To enable the student understand the anatomical features within the system instead of merely memorizing the technical terms and the textbook figures.</p> <p>4. To identify different plants with respect to its anatomical features though they are not studied as part of the syllabus.</p> <p>5. To enable a comparison existing among different parts in different plants.</p> <p>6. The student in identifying different plants by anatomical peculiarities.</p>
<b>3</b>	<b>CORE COURSE – Theory III PHYCOLOGY, MYCOLOGY AND LICHENOLOGY</b>	<p>1. To have a general understanding about the diverse groups of organisms.</p> <p>2. To enable the student to identify the different organisms by morphological and anatomical studies.</p> <p>3. To understand the evolutionary link between organisms.</p> <p>4. To appreciate the fantastic commonness exists among organisms.</p> <p>5. The student will be able to appreciate the uniqueness of different groups and the way they are classified.</p>
<b>4</b>	<b>CORE COURSE – Theory IV BRYOLOGY, PTERIDOLOGY, GYMNOSPERMS AND PALEOBOTANY</b>	<p>1. To attain knowledge on different groups of plants and their life cycle.</p> <p>2. To understand the interrelationships between plants.</p> <p>3. To make the students aware of the morphological, anatomical and reproductive features of primitive and advanced plants and their evolutionary link.</p>

			<p>4. To enable the student to appreciate their ecological importance and the need of conserving them.</p> <p>5. To develop curiosity in observing and identifying different groups of plants</p>
<b>5</b>	<b>CORE COURSE – PRACTICAL -I</b>		<p>1. To train the students in the use and maintenance of scientific equipment in biology.</p> <p>2. To develop in them the skills and the scientific way of studying different groups of organisms to study the inter relationship exist between different groups of plants and other organisms.</p> <p>3. To enable the students to identify different organisms by morphological and anatomical studies</p>
<b>6</b>	<b>CORE COURSE – Theory V TAXONOMY, MORPHOLOGY AND ECONOMIC BOTANY</b>		<p>1. To observe the variations among plants, especially angiosperms.</p> <p>2. To understand the description of a plant.</p> <p>3. To study the floral characters with an aim to identify the taxa authentically.</p> <p>4. To prepare taxonomic keys with the help of morphological and floral characters and to classify plants based on similar/dissimilar characters</p> <p>5. To study the distribution of flora in Northern Kerala</p> <p>6. To apply taxonomic data into various other fields.</p> <p>7. This study enriches the systematic Botany which can be utilized for botanical diagnosis of fragmentary crude drugs.</p>

			8. This study will be useful in identifying medicinal and other useful plants.
<b>7</b>	<b>CORE COURSE – Theory VI MICROBIOLOGY AND PLANT PATHOLOGY</b>		<p>1. To understand the evolutionary link between organisms.</p> <p>2. To appreciate the fantastic commonness that exists among organisms.</p> <p>3. The student will be able to appreciate the uniqueness of different groups and the way they are classified.</p> <p>4. To understand the symptomatology and prevention of plant diseases.</p>
<b>8</b>	<b>CORE COURSE - TheoryVII PLANT PHYSIOLOGY AND BIOCHEMISTRY</b>		<p>1. To make the students aware of the way by which life originated and how animate and inanimate matter differ each other with same types of molecules</p> <p>2. To impart up-to-date knowledge in the field of biochemistry</p> <p>3. To understand the interrelationships existing between metabolic pathways</p>
<b>9</b>	<b>CORE COURSE – Theory VIII BIOINFORMATICS, INSTRUMENTATION AND RESEARCH METHODOLOGY</b>		<p>1. To review the basic concepts &amp; functional knowledge in the field of informatics.</p> <p>2. To review functional knowledge in a standard office package and popular utilities</p> <p>3. To create awareness about nature of the emerging digital knowledge society</p> <p>4. To create awareness about social issues and concerns in the use of digital technology</p> <p>5. To create awareness about major informatic initiatives in India and Kerala</p>

		<p>6. To impart skills to enable students to use digital knowledge resources in learning</p> <p>7. To train the students in the use and maintenance of scientific equipment in biology</p>
<b>10</b>	<b>CORE COURSE – Theory IX PLANT TISSUE CULTURE, EMBRYOLOGY AND PALYNOLOGY</b>	<p>1. To identify different plants with respect to its anatomical features though they are not studied as part of the syllabus.</p> <p>2. To enable a comparison existing among different parts in different plants. And enable</p> <p>3. The student in identifying different plants by anatomical peculiarities.</p> <p>4. To know the development and to understand the life cycle of angiosperms and variations existing among them from flower to seed.</p>
<b>11.</b>	<b>CORE COURSE – Theory X GENETICS, BIOSTATISTICS AND EVOLUTION</b>	<p>1. To understand nature and the evolution of life.</p> <p>2. To enable them to investigate the evolutionary phenomena with out prejudices rather than reaching into hasty conclusions.</p> <p>3. To enable them to correlate the origin and evolution of life and how genetic studies contributed in understanding evolution.</p> <p>4. Enable students to understand the current trends in genetics.</p> <p>5. Make student aware of the historical process through which modern genetics evolved.</p> <p>6. To orient them in such a way that they will be able to apply the knowledge of</p>

			<p>classical and molecular genetics in agriculture, medicine, research and industry</p> <p>7. To create interest and develop appreciation in the tremendous growth of genetics and</p>
<b>12.</b>	<b>CORE COURSE – Theory XI BIOTECHNOLOGY AND CROP IMPROVEMENT</b>		<p>1. To know the fundamental techniques of biotechnology and the history of its development.</p> <p>2. To orient them to apply the technology in agriculture and other fields.</p> <p>3. To make them aware of the economic, social and environmental problems of gene manipulation</p> <p>4. To acquaint and train them in the use of the equipments in biotechnology</p> <p>5. To understand the application of bio technology and nanobiotechnology.</p>
<b>13</b>	<b>CORE COURSE – Theory XII CELL AND MOLECULAR BIOLOGY</b>		<p>1.To create in them a scientific approach in understanding nature and its evolution, beginning with atoms to its complexity through the cell.</p> <p>2. To enable them to appreciate the way scientists work in understanding evolution and the organization of cells.</p> <p>3. To understand the mechanism of cell reproduction and its biological consequences.</p>
<b>14.</b>	<b>CORE COURSE – PRACTICAL-II TAXONOMY , MORPHOLOGY AND ECONOMIC BOTANY</b>		<p>1. To train the students in the use and maintenance of scientific equipment in biology.</p> <p>2. To develop in them the skills and the scientific way of classifying, describing and identifying plants.</p>

			<p>3.To enable the students to identify different angiosperms by morphological and anatomical studies.</p> <p>4. To enable the student to understand the fundamentals of environmental science</p> <p>5. To study the inter relationship exist between different plants.</p>
<b>15</b>	<b>CORE COURSE – PRACTICAL-III- PLANT TISSUE CULTURE, EMBRYOLOGY AND PALYNOLOGY GENETICS, BIostatISTICS AND EVOLUTION BIOTECHNOLOGY AND CROP IMPROVEMENT CELL AND MOLECULAR BIOLOGY</b>		<p>1. To train the students in the use and maintenance of scientific instruments in biology and to do experiments in physiology and biochemistry.</p> <p>2. To develop in them the skills to do problems in genetics</p> <p>3. To enable the students to prepare cytological squash preparations and to identify cell division phases.</p> <p>4. To enable the student to understand the fundamentals of informatics and bio informatics.</p>
<b>16</b>	<b>6B16BOT/PLS PROJECT</b>		<p>1. Project work will kindle the spirit of research and invention among the students and will expose them to the realities outside their classrooms. It will impart sufficient academic and practical experience and motivate them to become self employed in the particular field.</p> <p>2. To have an acquaintance with scientific report writing, data analysis <i>etc.</i></p> <p>3. Field visit/ Study tour provides an opportunity to appreciate the environment, ecology and biodiversity aspects of plants. The dynamic nature of biosphere, interrelationships among individuals <i>etc.</i> can impart a need for conservation in students.</p>
<b>17</b>	<b>OPEN COURSE - ENVIRONMENTAL SCIENCE</b>		<p>1. To enable the students to understand the fundamentals of environmental science</p>



		<p>2. To enable them to contribute meaningfully in the conservation of the environment.</p> <p>3. To make them aware of the current global problems of the environment due to human intervention and the need of developing a sustainable way of life</p> <p>4. To appreciate bio diversity and the importance of conservation strategies.</p> <p>5. To make them aware of the global ecological crisis.</p>
<b>18</b>	<b>COMPLEMENTARY – 1 DIVERSITY OF LIFE-MICROBES &amp; THALLOPHYTES</b>	<p>1.To have a general understanding about the diverse groups of organisms</p> <p>2.To understand the nature and evolution of life</p> <p>3.To enable the students to identify the different microorganisms by microscopic studies.</p> <p>4.To get a comparative account of organisms with an evolutionary link</p>
<b>19</b>	<b>COMPLEMENTARY COURSE – 2 ARCHAEGONIATAE, PALAEOBOTANY AND REPRODUCTION IN ANGIOSPERMS</b>	<p>1.To have a general understanding about the diverse groups of plants</p> <p>2.To understand the nature and evolution of plant life</p> <p>3.To enable the students to identify the different plants by morphology and anatomy.</p> <p>4.To get a comparative account of plants with an evolutionary link</p>
<b>20</b>	<b>COMPLEMENTARY COURSE – 3 ANGIOSPERMS–MORPHOL OGY,SYSTEMATICS,UTILIT Y,PLANT BREEDING AND PLANT PATHOLOGY</b>	<p>1.To observe the variations among plants, especially angiosperms.</p> <p>2.To understand the way of description of a plant.</p> <p>3. To study the floral characters with an aim to identify the taxa authentically.</p>

		<p>5. To study the various types of floral distribution in Northern Kerala</p> <p>6.To apply all these data into various other fields.</p> <p>7.This study will be useful in identifying medicinal and other economically important taxa.</p>
<b>21</b>	<b>COMPLEMENTARY COURSE – 4 ANGIOSPERM - ANATOMY AND PHYSIOLOGY</b>	<p>1. To understand the physical principles which is needed to explain the mechanism of plant living and growth</p> <p>2. To enable the students in understanding the function of plants with respect to its environment and structure.</p> <p>3. To develop appreciation in the wonderful mechanism of transport systems exists in plants.</p> <p>4. To create research interest and observation skill by introducing the way by which plant physiology researches were carried out.</p>
<b>22</b>	<b>COMPLEMENTARY-5 BOTANY COMPLEMENTARY PRACTICAL</b>	<p>1. To train the students in the use and maintenance of scientific equipment in biology.</p> <p>2. To develop in them the skills and the scientific way of studying different groups of organisms to study the inter relationship exist between different groups of plants and other organisms.</p> <p>3. To enable the students to identify different organisms by morphological and anatomical studies</p>

## **2019 Admission Onwards (BSc Botany)**

### **Programme Outcomes**

#### **PO 1. Critical Thinking:**

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### **PO 2. Effective Citizenship:**

1. Learn to participate in nation building by adhering to the principles of sovereignty, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.
3. Internalise certain highlights of the nation's and region's history; especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

#### **PO 3. Effective Communication:**

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a wellinformed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

#### **PO 4. Interdisciplinarity:**

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

### **Programme Specific Outcomes**

**PSO1:** Skill development for the proper description using botanical terms, identification, naming and classification of life forms especially plants and microbes.

**PSO2:** Acquisition of knowledge on structure, life cycle and life processes that exist among plant and microbial diversity through certain model organism studies.

**PSO3:** Understanding of various interactions that exist among plants, animal and microbes; to develop the curiosity on the dynamicity of nature.

**PSO4:** Understanding of the major elements of variation that exist in the living world through comparative morphological and anatomical study.

**PSO5:** Ability to explain the diversity and evolution based on the empirical evidences in

morphology, anatomy, embryology, physiology, biochemistry, molecular biology and life history.

**PSO6:** Skill development for the collection, preservation and recording of information after observation and analysis- from simple illustration to molecular database development.

**PSO7:** Making aware of the scientific and technological advancements- Information and Communication, Biotechnology and Molecular Biology for further learning and research.

**PSO8:** Internalisation of the concept of conservation and evolution through the channel of spirit of inquiry.

### Course Outcome

Sl. No.	Name of Course (paper)	Outcomes
<b>1</b>	<b>CORE COURSE- 1- CYTOLOGY AND ANGIOSPERM ANATOMY</b>	<ol style="list-style-type: none"> <li>1. Knowledge on general terms with updated information used in cell biology.</li> <li>2. Observation of variations that exist in internal structure of various parts of a plant and as well as among different plant groups in support for the evolutionary concept.</li> <li>3. Skill development for the proper description of internal structure using botanical terms, their identification and further classification.</li> <li>4. Induction of the enthusiasm on internal structure of locally available plants.</li> <li>5. Understanding various levels of organization in a plant body with an outlook in the relationship between the structure and function through comparative studies.</li> </ol>
<b>2</b>	<b>CORE COURSE-2 REPRODUCTIVE BOTANY</b>	<ol style="list-style-type: none"> <li>1. Observation and classification of the floral variations from the premises of college and house.</li> <li>2. Understanding the various reproductive methods sub-stages in the life cycle of plants</li> <li>3. Observation and classification of the morphological variations in fruits and seeds of angiosperms.</li> <li>4. Enthusiasm to understand evolution based on the variations in reproduction among plants.</li> </ol>
<b>3</b>	<b>CORE COURSE-3 PLANT DIVERSITY I- ALGAE AND BRYOPHYTES</b>	<ol style="list-style-type: none"> <li>1. Understanding diversity in morphology, anatomy, reproduction and life cycle in lower groups of plants, algae and bryophytes.</li> </ol>

			<p>2. Skill Development in collection and preservation of algae and bryophytes.</p> <p>3. Realizing the economic/ecological importance of Algae and Bryophytes.</p> <p>4. Understanding the evolutionary lineages in algae and bryophytes</p>
<b>4</b>	<b>CORE COURSE- 4- PLANT DIVERSITY II – PTERIDOPHYTES AND GYMNOSPERMS</b>		<p>1. A comparative knowledge of lower vascular plants and lower group of flowering plants.</p> <p>2. Skill development for the proper description, identification and classification through morphological, anatomical and life cycle studies.</p> <p>3. Awareness on the morphological, anatomical and reproductive features of primitive and advanced plants with an evolutionary link between them.</p> <p>4. Skill development in collection preservation and studies in diversity studies of pteridophytes and gymnosperms.</p>
<b>5</b>	<b>CORE COURSE-05-CORE PRACTICAL -1</b>		<p>1.Learning the fundamental techniques used in a botany lab.</p> <p>2.Understands the working of science by first-hand experience.</p> <p>3.By comparing different plants and their vegetative and reproductive structures a generalisation in evolutionary concept is attained.</p> <p>4.Internalisation of practical skills for further application in free, independent, individual needs and helps in designing scientific experimentation.</p>
<b>6</b>	<b>CORE COURSE 6-ANGIOSPERM SYSTEMATICS AND ETHNOBOTANY</b>		<p>1. Understanding the main features in Angiosperm evolution.</p> <p>2. Skill development in identification and classification of flowering plants.</p>

		<p>3. Ability to identify, classify and describe a plant in scientific terms, thereby.</p> <p>4. Identification of plants using dichotomous keys.</p> <p>5. Recognition of locally available angiosperm families and plants.</p> <p>6. Recognition of economically important plants.</p> <p>7. Appreciation of human activities in conservation of useful plants from the past to the present.</p>
7	<b>CORE COURSE-7- PLANT PHYSIOLOGY AND METABOLISM</b>	<p>1. Preliminary understanding of the basic functions in a plant body.</p> <p>2. Awareness on the interdisciplinary nature of botany, chemistry and physics by studying the principles of plant life, growth and reproduction.</p> <p>3. Recognising the wonderful mechanism of transport and the Interrelationships existing between metabolic pathways thereby gaining an idea about the importance of plants in the dynamicity of nature.</p> <p>4. Enhance research interest among students by introducing the historical aspects of physiological research.</p>
8	<b>CORE COURSE- 8- MICROBIOLOGY, MYCOLOGY, LICHENOLOGY AND PHYTOPATHOLOGY</b>	<p>1. Understanding and appreciating the unity and diversity of microbes and fungi,</p> <p>2. Understanding the significance of microbes in nature's dynamicity.</p> <p>3. Develop skill in studying the fungal diversity through the study of representative taxon and methodology.</p> <p>4. Understanding the inter-relationship between plants and microbes is both beneficial and harmful.</p>

			5. Skill development to diagnose plant disease and to apply general control measures.
<b>9</b>	<b>CORE COURSE-9- RESEARCH METHODOLOGY, INSTRUMENTATION AND BIOSTATISTICS</b>		<p>1. Learning of the fundamental characteristics of science as a human enterprise, product and intellectual process</p> <p>2. Understanding the working of science for further application in free, independent, individual needs and in designing scientific experimentation.</p> <p>3. Appreciation of several scientific works and assessment of its influence on society.</p> <p>4. Acquire knowledge on the principles, components and applications of various scientific equipment in biology.</p> <p>5. Foundation knowledge in the basic concepts, components and functions of informatics.</p> <p>6. Appreciate the importance of statistical principles in biological research.</p>
<b>10</b>	<b>CORE COURSE -10- ENVIRONMENTAL SCIENCE AND PHYTOGEOGRAPHY</b>		<p>1. Understanding the fundamental concepts in ecology, environmental science and phytogeography.</p> <p>2. Concept development in conservation, global ecological crisis, Sustainable development and pros and cons of human intervention.</p> <p>3. Enable the student to appreciate bio diversity and the importance of various conservation strategies, laws and regulatory authorities.</p> <p>4. Recognition of the need for more research to create a baseline data for sustainable exploitation- Think globally and Act locally</p> <p>5. Analyse the interrelationship between the geography and pattern of distribution of plants.</p>

		<p>6. Appreciate key concepts from economic, political, and social analysis as pertained to the design and evaluation of environmental policies and institutions.</p> <p>7. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.</p> <p>8. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.</p>
<b>11</b>	<b>CORE COURSE -11-GENETICS, MOLECULAR BIOLOGY AND PLANT BREEDING</b>	<p>1. Identify the basic principles and current trends in classical genetics.</p> <p>2. Recognise the historical process of the evolution of molecular genetics from classical genetics.</p> <p>3. Review the relevance of the application of genetic principles in agriculture, medicine, research and industry.</p> <p>4. Outlining the use of genetic principles for conservation, defining and better understanding of nature.</p> <p>5. Develop theoretical background on molecular genetics to provide a strong support for the student for future research and employability.</p> <p>6. Appreciate the way scientists work in understanding biological processes and the organization of cells.</p> <p>7. Cite examples for scientific interventions to human and plant life through brief exposure to plant breeding principles.</p> <p>8. Modify the concept of gender, human diseases and their management based on the study of genetic principles of human beings.</p>



<b>12</b>	<b>CORE COURSE-12-BIOTECHNOLOGY AND BIOINFORMATICS</b>	<ol style="list-style-type: none"> <li>1. Develop knowledge of the fundamental techniques of biotechnology and the history of its development.</li> <li>2. Recognise theoretical knowledge on the equipment used in biotechnology which will give support during future prospects.</li> <li>3. Connect the genetic engineering principles in agriculture, medicine, research and industry for a better world.</li> <li>4. Identify the significance of nanobiotechnology results for updated knowledge in that field.</li> <li>5. Appreciate and criticise the information technology aided advancements in biology.</li> <li>6. Develop awareness on the economic, social and environmental problems of gene manipulation.</li> </ol>
<b>13</b>	<b>CORE COURSE-13-EVOLUTION AND PALAEOBOTANY</b>	<ol style="list-style-type: none"> <li>1. Understand the basic principles and current trends in classical evolution.</li> <li>2. Develop awareness on the historical process of plants and animals with an emphasis on human beings.</li> <li>3. Relate the evolutionary principles with agriculture, medicine, research and industry.</li> <li>4. Apply the principles of genetics and evolution in conservation, defining and better understanding of nature.</li> </ol>
<b>14</b>	<b>CORE COURSE- 14- CORE PRACTICAL II</b>	<ol style="list-style-type: none"> <li>1. Learning the fundamental techniques used in a botany lab related to Mycology, Microbiology, Angiosperms systematics</li> <li>2. Understands the working of science by first-hand experience.</li> <li>3. Comparison skill is attained by comparing different plants and their vegetative and reproductive structures.</li> </ol>

			4. Inculcation of practical skills for further application in free, independent, individual needs and helps in designing scientific experimentation.
<b>15</b>	<b>CORE COURSE- 15- CORE PRACTICAL III</b>		<p>1. Learning the fundamental techniques used in a botany lab related to Mycology, Microbiology, Angiosperms systematics</p> <p>2. Understands the working of science by first-hand experience.</p> <p>3. Comparison skill is attained by comparing different plants and their vegetative and reproductive structures.</p> <p>4. Inculcation of practical skills for further application in free, independent, individual needs and helps in designing scientific experimentation.</p>
<b>16</b>	<b>CORE COURSE 16- PROJECT/FIELD STUDY/VIVA VOCE</b>		<p>1. Learning the fundamental techniques used in a research</p> <p>2. First-hand experience in doing science.</p> <p>3. Development of the skill to communicate science.</p> <p>4. Internalisation of skills for further application in designing scientific experimentation.</p>
<b>17</b>	<b>COMPLEMENTARY ELECTIVE COURSE IN BOTANY– 1 MICROBIOLOGY, PHYCOLOGY, MYCOLOGY AND LICHENOLOGY</b>		<p>1. Understanding of the fundamental concepts in classification of plants.</p> <p>2. Concept development in structure and reproduction of lower plants.</p> <p>3. Enable the student to appreciate biodiversity, sustainable development with the help of their core subject and subsidiary subject botany.</p> <p>4. Induce to experiment on the subject in an intensive way to facilitate an Interdisciplinary profession/enterprise/entrepreneurship</p>
<b>18</b>	<b>COMPLEMENTARY ELECTIVE COURSE IN BOTANY– 2</b>		1. Understanding of the fundamental concepts in classification of Bryophytes, Pteridophytes, Gymnosperms.

	<b>BRYOLOGY, PTERIDOLOGY, GYMNOSPERM BIOLOGY, PALAEOBOTANY, PHYTOPATHOLOGY AND ANGIOSPERM EMBRYOLOGY</b>		<p>2. Concept development in structure and reproduction of lower plants.</p> <p>3. Enable the student to appreciate biodiversity, evolution and sustainable development with the help of their core subject and subsidiary subject botany.</p> <p>4. Induce to experiment on the subject in an intensive way to facilitate an interdisciplinary profession/ enterprise/ entrepreneurship</p>
<b>19</b>	<b>COMPLEMENTARY ELECTIVE COURSE IN BOTANY– 3 ANGIOSPERM MORPHOLOGY, ANATOMY AND SYSTEMATICS</b>		<p>1. Understanding of the fundamental concepts in classification of Angiosperms.</p> <p>2. Concept development in diversity that exists in angiosperms through studies in morphology, anatomy and systematic.</p> <p>3. Enable the student to appreciate the economic importance of plants belonging to the specified families.</p> <p>4. Induce to experiment on the subject in an intensive way to facilitate an interdisciplinary profession/ enterprise/ entrepreneurship</p>
<b>20</b>	<b>COMPLEMENTARY ELECTIVE COURSE IN BOTANY – 4 PLANT PHYSIOLOGY, ECOLOGY AND APPLIED BOTANY</b>		<p>1. Understanding of the fundamental concepts in Physiology</p> <p>2. Concept development in plant ecology.</p> <p>3. Enable the student to appreciate biodiversity, sustainable development with the help of their core subject and subsidiary subject botany in Its biotechnology era.</p> <p>4. Induce to experiment on the subject in an intensive way to facilitate an interdisciplinary profession/ enterprise/ entrepreneurship.</p>
<b>21</b>	<b>COMPLEMENTARY ELECTIVE COURSE IN BOTANY-5- COMPLEMENTARY BOTANY PRACTICAL</b>		<p>1. Learning the fundamental techniques used in a botany lab.</p> <p>2. First-hand experience in doing science.</p>

			3.Internalisation of practical skills for further application in free, independent, individual needs and helps in designing scientific experimentation.
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## Details

- **Programme outcome:** It is attained in the period of UG / PG Programme -common to all UG courses (common for all PG courses).
- **Programme specific outcome:** For each UG programme, it is different. Programme specific outcomes of B.Sc Mathematics and B.Sc Physics are different.
- **Course outcome:** Paper (course) wise outcome. In the case of Mathematics there are 14 core courses, 8 complementary courses and one open course.
- Use 2014 syllabus to prepare PO, PSO and CO for the academic year 2018-19.
- Use 2019 syllabus to prepare PO, PSO and CO for the academic year 2019-20.
- **Programme Outcome, Programme Specific Outcome and Course Outcome are included in the 2019 syllabus. Collect course outcomes of each paper (course) and consolidate the same.**
- **It will be uploaded on the college website.**

## **Programme Outcome, Programme Specific Outcome and Course Outcome**

**Name of the Department: ZOOLOGY**

### **2014 - 2018 Admission (BSc Zoology)**

#### **Programme Outcomes**

- (i) It envisages the student to learn the basics of science and the branch of Zoology, which would enable the student to think critically to solve real-world problems.
- (ii) The programme promotes the student to take up inter-disciplinary projects.
- (iii) The student when completing the course would differentiate science and pseudo-science, provide solutions to tackle problems and take up leadership roles in society.

#### **Programme Specific Outcomes**

- (i) Learn the nuances of animal sciences and its various branches.
- (ii) Capability for ecological and biodiversity analysis.
- (iii) Capability for taxonomic characterization of animals and identification and conservation of flora and fauna.

## Course Outcome

Sl. No.	Name of Course (paper)	Outcomes
<b>ZOOLOGY CORE COURSE</b>		
1	ZOOLOGY CORE COURSE- I Code: 1B01ZLG PROTISTA AND NONCHORDATA - I	i The course is designed to give the student a comprehensive idea of protistan and non-chordate diversity, structure and functions. The type studies are intended to provide an understanding of the typical protista and invertebrate body structure, which has a lot in common in the various groups.
2	ZOOLOGY CORE COURSE- 2 PROTISTA AND NON-CHORDATA –II Code: 2B02ZLG (DIVERSITY, ADAPTATIONS AND FUNCTIONAL ANATOMY OF NON-CHORDATE COELOMATES)	i The course is designed to give the student a comprehensive idea of non-chordate diversity, structure and functions. The type studies are intended to provide an understanding of the typical invertebrate body structure, which has a lot in common in the various groups.
3	Zoology Core Course – 3 Code: 3B03ZLG Chordata - I	The course is designed to give the student a comprehensive idea of chordate diversity, structure and functions. The type studies are intended to provide an understanding of the typical vertebrate body structure, which has a lot in common in the various groups.
4	Zoology Core Course– 4 Code:4B04ZLG Chordata– II and Comparative Anatomy	The course is designed to give the student a comprehensive idea of higher chordate diversity- birds and mammals, their structure and functions. The type studies are intended to provide an understanding of the typical vertebrate body structure, which has a lot in common in the various groups.
5	Zoology Core Course-5	The course is intended to give the student a basic understanding of the

	Code: 5BO5 ZLG BIOCHEMISTRY AND ENDOCRINOLOGY		fundamental concepts in biochemistry and endocrinology, which can help in his/her understanding of other areas such as physiology. At the end of the course, the student should have an idea regarding the basic physical and chemical reactions that underlies life processes.
6	Zoology Core Course-6 Code: 5B06 ZLG BIOPHYSICS, BIOSTATSTICS & METHODOLOGY		This course is meant to introduce methodology and perspectives of science and the techniques in biophysics to help the student pursue systematically his/her interests in the chosen branch of science, i.e., zoology, in this programme. At the end of the course, the student should be able to apply scientific methods independently in his areas of pursuit.
7	Zoology Core Course -7 Code: 5BO7ZLG CELL BIOLOGY AND IMMUNOLOGY		To give the students overall knowledge of cell studies, which forms one of the foundations of biological sciences. The topics cover the basic concepts in cytology and the various means and methods used in the study of cell and cell structures. Together with the practical, the student can develop basic skills in the field of microscopy and staining techniques. A few basic concepts in immunology have been added to introduce the student to this frontier area of biology.
8	ZOOLOGY CORE COURSE 8 Code: 5B08ZLG HEREDITARY SCIENCE		The course offers a comprehensive understanding of Genetics and human genetics, an area that includes certain applied frontier concepts of biological science. The topics introduce both basic concepts as well as applied aspects. At the end of the course, the student should develop a clear idea regarding the fundamentals responsible for heredity and also the various methods of manipulating these factors for human welfare, understanding of the various factors that contribute to congenital problems and to what extend their

			incidence can be reduced, and in case of occurrence, be managed
9	Zoology Core Course -9 Code: 5BO9ZLG Comparative Animal Physiology and Human Physiology		The course is designed to give the student a detailed understanding of the major physiological processes. It is intended to convey concepts, which will kindle interest in the intricate mechanisms involved in the functioning of a living being.
10	ZOOLOGY Core Course- 10 Code: 6B10ZLG MOLECULAR BIOLOGY & BIOINFORMATICS		The course familiarizes students with molecular biology which is an applied frontier area of biological science. The section on Bioinformatics aims to understand and organize the information associated with these molecules to answer some of the larger questions in biology
11	ZOOLOGY Core Course- 11 Code: 6B11ZLG ENVIRONMENTAL SCIENCE AND CONSERVATION BIOLOGY		To create a solid base in the basic concepts of environmental studies and to give appreciation to the diversity of life on earth. To provide an understanding of different levels of biological diversity. To realize the current status of biodiversity and to create interest in the conservation of biodiversity
12	ZOOLOGY CORE COURSE 12 Code: 6B12ZLG DEVELOPMENTAL BIOLOGY, TERATOLOGY & GERONTOLOGY		The course is designed to give the student a detailed understanding of the major steps in embryological development. It is intended to convey concepts, which will kindle interest in the intricate mechanisms involved in the development of animals.
13	Zoology Core Course -13 Code: 6B13ZLG ETHOLOGY, EVOLUTION AND ZOOGEOGRAPHY		To introduce the students to a comprehensive account of the important concepts in evolution and ethology. Topics are included to present both the classic as well as the modern views concerning the process of evolution. The student is expected to get a broad idea about the mechanisms involved in the process of natural selection and evolution of animal species. Topics in



			ethology are selected to help the students understand the basics of the subject. The topics in zoogeography aim to give a basic idea about the factors that affect animal distribution and to give an overview of the faunal features of our region.
14	Zoology Core Course - 14 Code: 6B14ZLG APPLIED ZOOLOGY		This course is designed to provide the student with an outlook on the various applied fields of animal sciences. It teaches how zoology could be beneficial or harmful from an economic perspective.
15	PRACTICAL- I Code: 4B04ZLG (P) (PROTISTA, NON CHORDATA AND CHORDATA)		This course provided an experiential learning experience to the student regarding animal morphology and anatomy. It involves dissections and morphological study. It enables the student to experience the topics learned in the theory classes.
16	Practical II Code: 6B02 ZLG (P)		It provides experiential learning in Ecology, developmental biology, cell biology, genetics etc. The course enables the student to be capable of analysis related to these topics. Differential blood count would enable the student to look at the health condition of a person. Practical sessions in ecology would enable the student to analyse the health of an environmental sample.
17	PRACTICAL III Code: 6B03 ZLG (P) BIOCHEMISTRY, BIOPHYSICS, PHYSIOLOGY, BIOSTATISTICS, BIOINFORMATICS & APPLIED ZOOLOGY		It prepares the student to analyse blood and urine samples and to take up projects in applied fields of Zoology like apiculture, sericulture etc.
<b>ZOOLOGY OPEN COURSE</b>			
18	ZOOLOGY OPEN COURSE 2 Code: 5D02ZLG		The course is designed to introduce students to two important applied fields in zoology, which is of great potential in

	APICULTURE AND SERICULTURE		the rural economy of India. Both beekeeping and silkworm rearing offer great employment opportunities in rural India and are major export-oriented agro-industries. The objective of the course is to provide introductory knowledge in these fields so that interested students can take on these fields as a profitable hobby or even as a self-employment venture. The knowledge gained can be used to replace the age-old practices in these fields with modern methods that are more productive and also give better quality products.
<b>ZOOLOGY COMPLEMENTARY COURSE</b>			
19	1C01ZLG DIVERSITY OF LIFE I PROTISTANS & NON CHORDATES		The syllabus is designed as a complementary course to students of other biological sciences. It aims to give an overall idea regarding the major animal phyla and the peculiar features of certain important groups and also to provide an exposure to the wide diversity existing in the animal kingdom.
20	2C02ZLG DIVERSITY OF LIFE – II CHORDATE FORM AND FUNCTION		The course is meant to provide to give the student outline knowledge of the complexities of vertebrate structure and function, besides providing a glimpse into the diversity of vertebrates. The fundamentals of early development are included for a general understanding of the processes involved.
21	3C03ZLG AGRICULTURAL AND FOREST ENTOMOLOGY		This course introduces the fundamentals of applied entomology and is meant to enhance the study of related core subjects like botany. The objective is to give the student a broad understanding of the role of insects in human life. A concise account of insecticides and their hazards would help develop the needed awareness in this area.
22	4C04ZLG		This course is designed to introduce a very important applied aspect of biology,

	MEDICAL ZOOLOGY		which has a direct bearing on human health and well being. At the end of the course, the student should have a clear understanding of the various causative organisms and factors and also how and what preventive measures can be adopted against these.
23	4C05ZLG (P) PRACTICAL		It teaches the student basic analysis of biological samples and also provides experiential learning about the morphology and anatomy of animals.

## **2019 Admission Onwards (BSc Zoology)**

### **Programme Outcomes**

#### **PO 1.Critical Thinking:**

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### **PO 2.Effective Citizenship:**

1. Learn to participate in nation-building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender-sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalization.
3. Internalize certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernization of the postcolonial society.

#### **PO 3.Effective Communication:**

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

#### **PO 4.Interdisciplinarity:**

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind.

2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem-solving and evolving a comprehensive perspective.

## **Programme Specific Outcomes**

**PSO1:** Skill development for the proper identification, naming and classification of life forms especially animals.

**PSO2:** Acquisition of knowledge on the structure, life cycle and life processes that exist among animal diversity through certain model organism studies.

**PSO3:** Understanding of various interactions that exist among plants animals and microbes; to develop curiosity and love on the dynamicity of nature.

**PSO4:** Understanding of the major elements of variation that exist in the living world through comparative morphological and anatomical study.

**PSO5:** Ability to explain diversity and evolution based on the empirical evidence in Morphology, Anatomy, Embryology, Physiology, Biochemistry, Molecular Biology and Life history.

**PSO6:** Skill development in the observation and study of nature, biological techniques and scientific investigation.

**PSO7:** Making aware of the scientific and technological advancements in the fields of Information and Communication, Biotechnology and Molecular Biology for further learning and research.

**PSO8:** Internalization of the concept of conservation and evolution through the channel of the spirit of inquiry.

## Course Outcome

Sl. No.	Name of Course (paper)	Outcomes
<b>Zoology Core Course</b>		
1	Zoology Core Course-1  PROTISTA AND NONCHORDATA-I  Code:1B01ZLG	<p><b>CO1.</b> To understand the basic methods in zoology and animal classification.</p> <p><b>CO2.</b> Able to appreciate the process of evolution (unicellular cells to complex, multicellular organisms)</p> <p><b>CO3.</b> Familiar with the protist and non-chordate world (from Phylum Porifera to Mesozoa) that surrounds us.</p> <p><b>CO4.</b> Able to identify the invertebrates (from Phylum Porifera to Mesozoa) and classify them up to the class level with the basis of systematics</p> <p><b>CO5.</b> Understand the basis of life processes in the non-chordates (from Phylum Porifera to Mesozoa) and recognize the economically important invertebrate fauna.</p>
2	Zoology Core Course -2  NONCHORDATA- 2  Code: 2B02ZLG	<p><b>CO1.</b> Familiar with the non-chordate world (Coelomates - from Phylum Annelida to Hemichordata) that surrounds us.</p> <p><b>CO2.</b> Able to identify the invertebrates (Coelomates - from Phylum Annelida to Hemichordata) and classify them up to the class level with the basis of systematics</p> <p><b>CO3.</b> Understand the basis of life processes in the non-chordates (from Coelomates - from Phylum Annelida to Hemichordata) and recognize the economically important invertebrate fauna.</p>
3	Zoology Core Course - 3  Chordata - I  Code: 3B03ZLG	<p><b>CO1:</b> Understand the origin and evolutionary relationship in different subphyla of chordates.</p> <p><b>CO2:</b> To understand the diversity of chordates (from urochordates to reptiles).</p> <p><b>CO3:</b> Understand the unique characters of urochordates, cephalochordates and vertebrates</p>

		CO4: Recognize the life functions of chordates (from urochordates to reptiles).
4	Zoology Core Course – 4  Chordata – II and Comparative Anatomy  Code: 4B04ZLG	<b>CO1:</b> Understand the general and unique characteristics and classification of Aves and Mammals <b>CO2:</b> Understand the diversity and relation in the form and structure of chordates.
5	Zoology Core Course -5  EVOLUTION, ETHOLOGY AND RESEARCH METHODOLOGY  Code: 5B05ZLG	<b>CO1.</b> Realise that the whole living system has a common ancestry and so all are related <b>CO2.</b> Realize the fundamental characteristics of science as a human enterprise <b>CO3.</b> Apply scientific methods in day to day life <b>CO4.</b> Able to design a research work on a topic
6	Zoology Core Course-6  ANIMAL PHYSIOLOGY  Code: 5B06ZLG	<b>CO1.</b> Understand the function of various systems at cellular and system levels <b>CO2.</b> Understand the mechanisms that work to keep the body alive and functioning <b>CO3.</b> Apply the knowledge to lead a healthy life
7	Zoology Core Course -7  BIOCHEMISTRY AND BIOPHYSICS  Code: 5B07ZLG	<b>CO1.</b> Understand the importance of Biomolecules. <b>CO2.</b> Familiar with various biochemical pathways <b>CO3:</b> Develop knowledge about equipment like microscopes, spectrophotometers, centrifuges etc
8	ZOOLOGY CORE COURSE 8  GENETICS  Code: 5B08ZLG	<b>CO1.</b> Comprehensive and detailed understanding of the chemical basis of heredity. <b>CO2.</b> Understanding the role of genetics in evolution. <b>CO3.</b> The ability to evaluate conclusions that are based on genetic data.

		<b>CO4.</b> The ability to understand the results of genetic experimentation in animals.
9	ZOOLOGY CORE COURSE 9  CELL BIOLOGY, IMMUNOLOGY AND MICROBIOLOGY  Code: 6B09ZLG	<b>CO1.</b> Structural and functional aspects of the basic unit of life i.e. cell concepts <b>CO2.</b> Gather basic concepts of Cell Biology along with various cellular functions <b>CO3.</b> Understand the basic concepts of immunity <b>CO4.</b> Understand the diversity of microbes and their use and harm
10	ZOOLOGY Core Course- 10  Code: 6B10ZLG  MOLECULAR BIOLOGY & BIOINFORMATICS	<b>CO1.</b> Understand the importance of Biomolecules <b>CO2.</b> Familiar with various tools and applications of Bioinformatics.
11	ZOOLOGY Core Course- 11  Code: 6B 11 ZLG  ENVIRONMENTAL SCIENCE	<b>CO1.</b> Able to describe the relationship between abiotic and biotic factors. <b>CO2.</b> Students are able to describe various biological interactions. <b>CO3.</b> Students are able to understand how a change in population affect the ecosystem
12	ZOOLOGY CORE COURSE 12  Code:6B12ZLG  DEVELOPMENTAL BIOLOGY	<b>CO1.</b> Understand the major steps in embryological development. <b>CO2.</b> Understand the intricate mechanisms involved in the development of animals.
13	PRACTICAL- I  (PROTISTA , NON CHORDATA AND CHORDATA )  Code:4B 01 ZLG( P)	<b>CO1.</b> Understand the taxonomic diversity of animals and gain knowledge about morphological diversity, adaptations, variations and parallelisms. <b>CO2.</b> To get a total understanding of the anatomy of animals and the functioning of different systems.
14	Practical II  Code: 6B02 ZLG(P)	<b>CO1.</b> Understand what heredity means, by analysing different genetic problems, genetic conditions and understand the unity of life. <b>CO2.</b> Understand the ultrastructure of cells and tissues and acquire the skill to view cells and tissues.



15	<p>PRACTICAL III</p> <p>CODE: 6B03 ZLG(P)</p> <p>BIOCHEMISTRY, BIOPHYSICS, PHYSIOLOGY, BIOSTATISTICS, BIOINFORMATICS.</p>	<p><b>CO1.</b> Learn how to analyse data and use that knowledge to make sense of the data generated from different experiments.</p> <p><b>CO2.</b> Learn how to analyse biological samples</p> <p><b>CO3.</b> Learn how to analyse bioinformatics data.</p>
<b>Complementary course</b>		
17	<p>1C01ZLG</p> <p>DIVERSITY OF LIFE I PROTISTANS &amp; NON CHORDATES</p>	<p><b>CO1.</b> Familiar with the non-chordate world that surrounds us.</p> <p><b>CO2.</b> Able to identify the invertebrates and classify them up to the class level with the basis of systematics.</p> <p><b>CO3.</b> Understand the basis of life processes in the non-chordates and recognize the economically important invertebrate fauna.</p>
18	<p>2C02ZLG</p> <p>DIVERSITY OF LIFE – II CHORDATE FORM AND FUNCTION</p>	<p><b>CO1:</b> Understand the origin and evolutionary relationship in different subphyla of chordates.</p> <p><b>CO2:</b> Understand the diversity of chordates</p> <p><b>CO3:</b> Understand the unique characters of urochordates, cephalochordates and vertebrates</p> <p><b>CO4:</b> Recognize life functions of chordates</p>
19	<p>Course Code:3CO3ZLG</p> <p>Animal physiology</p>	<p><b>CO1.</b> Understand the function of various systems at cellular and system levels</p> <p><b>CO2.</b> Understand the mechanisms that work to keep the body alive and functioning</p> <p><b>CO3.</b> Apply the knowledge to lead a healthy life</p>
	<p>4C04ZLG</p> <p>MEDICAL ZOOLOGY</p>	<p><b>CO1:</b> Understanding of the various causative organisms and factors and also how and what preventive measures can be adopted against these.</p>
	<p>4C05ZLG(P)</p>	<p><b>CO1.</b> Understand the taxonomic diversity of animals and gain knowledge about morphological diversity, adaptations, variations and parallelisms.</p>

		<p><b>CO2.</b> To get a total understanding of the anatomy of animals and the functioning of different systems.</p> <p><b>CO3.</b> Understand the ultrastructure of cells and tissues and acquire the skill to view cells and tissues.</p>
<b>Open course</b>		
	<p>ZOOLOGY Generic Elective Course APICULTURE Code: 5D02ZLG or ZOOLOGY Generic Elective Course SERICULTURE Code : 5D03ZLG</p>	<p><b>CO1:</b> Develop self-employment capabilities.</p> <p><b>CO2:</b> Acquires scientific knowledge of profitable farming.</p> <p><b>CO1:</b> Develop self-employment capabilities.</p> <p><b>CO2:</b> Acquires scientific knowledge of sericulture</p>

# **Programme Outcome, Programme Specific Outcome and Course Outcome**

**Name of the Department: HOME SCIENCE**

**2014-2018 Admission (BSc Home Science)**

## **PO 1.Critical Thinking:**

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

## **PO 2.Effective Citizenship:**

1. Learn to participate in nation-building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender-sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalization.
3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernization of the post-colonial society.

## **PO 3.Effective Communication:**

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

## **PO 4.Interdisciplinarity:**

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind

2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem-solving and evolving a comprehensive perspective.

### **Programme Specific Outcomes**

**PSO 1:** Understand the basic concepts of Food Science, Nutrition, Food preservation, Microbiology, Clinical Nutrition and Dietetics.

**PSO 2:** Skill development for the management of family resources, housing and interior decoration.

**PSO 3:** Acquisition of knowledge regarding mental and physical development of human beings through the learning of Human Physiology, Child Development and General Psychology.

**PSO 4:** Understand the basic concepts of Textile Science, Apparel Designing and Fashion Designing.

**PSO 5:** Understand the role and practices of Mass Communication in Extension and the importance of Home Science extension.

### **Course Outcome**

Sl. No.	Name of Course (paper)	Outcomes
1	Theory - 1 Food Science	CO 1: To familiarize with basic areas of Food Science and Nutrition CO 2: To understand the composition, chemistry of foods and their applications in food Preparations. CO 3: To study the plant food sources and their importance in human nutrition CO 4: To understand the animal food sources and their importance in human nutrition CO 5: To understand the balanced diet and its importance.

2	Theory - 2 Food Preservation and Microbiology	<p>CO 1: To know the basics of preservation and processing technology.</p> <p>CO 2: To impart knowledge regarding the physical and chemical principles in food processing and ways of quality control, waste disposal and sanitation in food industries.</p> <p>CO 2: To understand the economic importance of microorganisms.</p> <p>CO 3: To understand the principles of various methods used in the prevention and control of microorganisms</p>
3	Theory - 3 Interior Decoration	<p>CO 1: To identify the elements and principles of design.</p> <p>CO 2: To determine the application of colour and light in interior decoration.</p> <p>CO 3: To state the role of accessories, furniture and furnishings in interior decoration.</p> <p>CO 4: To explain the aspects of housing and interior-exterior space organisation</p>
4	Theory – 4 Family Resource Management	<p>CO 1: To identify the concept and steps in the process of management.</p> <p>CO 2: To determine the types and characteristics of resources.</p> <p>CO 3: To acquire skills in the management of family resources.</p> <p>CO 4: To explain the concept of consumer education</p>

5	Theory – 5 Child Development	<p>CO 1: To understand the methods of child study and the areas of development.</p> <p>CO 2: To understand the prenatal development and the importance of the neonatal period</p> <p>CO 3: To understand the domains of development from birth to the adolescent period.</p> <p>CO 4: To understand the importance of early childhood care and education</p> <p>CO 5: To understand the need and importance of early identification, intervention and stimulation</p>
6	Theory – 6 Human Physiology	<p>CO 1: To understand the basics of human physiology. and blood.</p> <p>CO 2: To know about human blood, blood groups and their functions.</p> <p>CO 3: To understand the structure and functioning of different systems of the human body.</p> <p>CO 4: To understand the integrated functions of the various systems of the human body.</p>
7	Theory – 7 Human Nutrition	<p>CO 1: To enable the students to understand Nutrition science and its relevance.</p> <p>CO 2: To enable the students to obtain an insight into the chemistry of major nutrients and physiologically important compounds.</p> <p>CO 3: To enable the students to understand the importance and functions of nutrients.</p> <p>CO 4: To enable the students to know the deficiency diseases.</p>

8	Theory - 8 Textile Science and Apparel Designing - I	CO 1: To gain knowledge about textile fibres and their use CO 2: To develop an understanding of various kinds of fabrics, their structure and utility CO 3: To understand the basic elements and principles of design CO 4: To gain knowledge in the selection of clothing and wardrobe planning CO 5: To know the concept of fashion and its terminologies and to learn the basic figure drawing and illustration
9	Theory - 9 Extension Education	CO 1: To make the students understand the principles of extension. CO 2: To understand the ways and means of home science extension. CO 3: Develop skills in preparing and using audio-visual aids in extension work. CO 4: Understand the process of communication in Home Science Education.
10	Theory - 10 General Psychology	CO 1: To gain knowledge about basic facts and principles of psychology. CO 2: To understand the biological basis of behaviour, nature of sensation and perception. CO 3: To impart knowledge about learning, memory and forgetting. CO 4: To understand the basic concepts of intelligence and personality

11	Theory - 11 Clinical Nutrition and Dietetics	CO 1: To Impart knowledge in the field of clinical nutrition CO 2: Be able to make appropriate dietary modifications for various disease conditions based on the pathophysiology CO 3: To develop capacity and aptitude for taking up dietetics as a profession CO 4: Understand the consequence of nutritional problems in society and have awareness of community nutrition-based programs.
12	Theory – 12 Textile Science and Apparel Designing - II	CO 1: To impart knowledge on textile dyeing, printing and finishing of fabrics. CO 2: To understand the types and uses of new generation textiles available in the market. CO 3: To impart knowledge in apparel production, marketing and merchandising. CO 4: To impart knowledge on garment construction CO 5: To enable the students to develop skills in pattern making
13	Project	CO 1: To enable the students to understand basic principles of research design CO 2: To enable the students to develop an interest in Home science research. CO 3: To enable the students to analyze the collected data CO 4: To enable the students to prepare the project report.



14	Open Course -1 Applied Counselling	<p>CO 1: To acquaint the students with the concepts of counselling.</p> <p>CO 2: To familiarizes the students with different types and approaches in counselling.</p> <p>CO 3: To enable the students to understand counselling relationship and skills.</p> <p>CO 4: To enable the students about the nature and process of counselling</p> <p>CO 5: To develop awareness among the students about the application of counselling.</p>
15	Practical I (Part-1) Food Science	<p>To familiarize with basic areas of Food Science and Nutrition.</p> <p>To understand the composition, chemistry of foods and their applications in food preparations.</p> <p>To study the plant food sources and their importance in human nutrition</p> <p>To understand the animal food sources and their importance in human nutrition</p> <p>To understand the balanced diet and its importance.</p>
16	Practical - I (Part 1&2) Food Science and Food Preservation	<p>CO 1: To enable the students to understand food preservation by drying</p> <p>CO 2: To enable the students to prepare fruit beverages, squash, jam jelly etc.</p> <p>CO 3: To enable the students to develop skills in the preparation of pickles, wine etc.</p>

<b>17</b>	Practical II (Part 1) Interior Decoration	CO 1: To identify the elements and principles of design. CO 2: To determine the application of colour and light in interior decoration. CO 3: To state the role of accessories, furniture and furnishings in interior decoration. CO 4: To explain the aspects of housing and interior-exterior space organisation.
<b>18</b>	Practical II (Parts 1&2) Interior Decoration and Resource Management	CO 1: To enable the students to understand the application of elements and principles of design in the interior of the house. CO 2: To enable the students to develop skills in a flower arrangement. CO 3: To enable the students to gain practical knowledge for various curtain styles CO 4: To enable the students to utilize their skills in creative arts
<b>19</b>	Practical III (Part-1) Human Nutrition	CO 1: To enable the students for learning by doing the qualitative tests for nutrients CO 2: To enable the students for doing the quantitative measurements of Vitamin C and Calcium in foodstuffs

20	Practical IV (Part-1) Textile Science	<p>CO 1: To enable the students to familiarise and identify different fabric material their fibres.</p> <p>CO 2: To develop an understanding of basic weaves and their identification.</p> <p>CO 3: To enable the students to develop skills in stitches and the garment construction process.</p> <p>CO 4: To enable the students to design formal and party wear for teenagers and preschoolers</p>
21	Practical III (Part-1I) Nutrition and Dietetics	<p>CO 1: To enable the students to take BMI-weight measurements and to do the calculation.</p> <p>CO 2: To enable the students to develop skills in preparing therapeutic recipes.</p> <p>CO 3:.. To impart knowledge for planning diets for people in different conditions.</p> <p>CO 4:.. To enable the students to provide an opportunity to learn by observing.</p>
22	Practical IV (Part 1&2) Textile Science and Apparel Designing	<p>CO 1: To enable the students to understand and develop skill in fabric dyeing and printing.</p> <p>CO 2: To enable the students to take body measurements for garment construction</p> <p>CO 3:.. To enable the students to develop skills in garment construction</p> <p>CO 4:.. To enable the students to gain knowledge through industrial visits.</p>

## **2019 Admission Onwards (BSc Home Science)**

### **PO 1.Critical Thinking:**

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

### **PO 2.Effective Citizenship:**

1. Learn to participate in nation-building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender-sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalization.
3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernization of the post-colonial society.

### **PO 3.Effective Communication:**

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

### **PO 4.Interdisciplinarity:**

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind
2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
3. Develop aesthetic, social, humanistic and artistic sensibilities for problem-solving and evolving a comprehensive perspective.

### Programme Specific Outcomes

**PSO 1:** Understand the basic concepts of Food Science, Nutrition, Food preservation, Microbiology, Clinical Nutrition and Dietetics.

**PSO 2:** Skill development for the management of family resources, housing and interior decoration.

**PSO 3:** Acquisition of knowledge regarding mental and physical development of human beings through the learning of Human Physiology, Child Development and General Psychology.

**PSO 4:** Understand the basic concepts of Textile Science, Apparel Designing and Fashion Designing.

**PSO 5:** Understand the role and practices of Mass Communication in Extension and the importance of Home Science extension.

### Course Outcome

Sl. No.	Name of Course (paper)	Outcomes	
<b>1</b>	Theory – 1 Human nutrition	<b>i</b>	To enable the students to understand Nutrition science and its relevance.
		<b>ii</b>	To enable the students to obtain an insight into the chemistry of major nutrients and physiologically important compounds
		<b>iii</b>	To enable the students to understand the importance and functions of nutrients.
		<b>iv</b>	To enable the students to know the deficiency diseases.
<b>2</b>	Theory - 2 Food Preservation and Microbiology	<b>i</b>	To know the basics of preservation and processing technology.
		<b>ii</b>	To impart knowledge regarding the physical and chemical principles in food processing and ways of quality control, waste disposal and sanitation in food industries.
		<b>iii</b>	To understand the economic importance of microorganisms.
		<b>iv</b>	To understand the principles of various methods used in the prevention and control of microorganisms.

<b>3</b>	Theory -3  Interior decoration	<b>i</b>	To identify the elements and principles of design.
		<b>ii</b>	To determine the application of colour and light in interior decoration
		<b>iii</b>	To state the role of accessories, furniture and furnishings in interior decoration.
		<b>iv</b>	To explain the aspects of housing and interior-exterior space organisation.
<b>4</b>	Theory – 4  Family Resource Management	<b>i</b>	To identify the concept and steps in the process of management.
		<b>ii</b>	To determine the types and characteristics of resources.
		<b>iii</b>	To acquire skills in the management of family resources
		<b>iv</b>	To explain the concept of consumer education.
<b>5</b>	Theory – 5  Child Development	<b>i</b>	To understand the methods of child study and the areas of development.
		<b>ii</b>	To understand the prenatal development and the importance of a neonatal period
		<b>iii</b>	To understand the domains of development from birth to the adolescent period.
		<b>iv</b>	To understand the importance of early childhood care and education
		<b>v</b>	To understand the need and importance of early identification, intervention and stimulation.
<b>6</b>	Theory – 6  Human Physiology	<b>i</b>	To understand the basics of human physiology and blood.
		<b>ii</b>	To know about human blood, blood groups and its functions.

		<b>iii</b>	To understand the structure and functioning of different systems of the human body.
		<b>iv</b>	To understand the integrated functions of the various systems of the human body.
<b>7</b>	Theory – 7  Food Science and Nutrition	<b>i</b>	To familiarize with basic areas of Food Science and Nutrition.
		<b>ii</b>	To understand the composition, chemistry of foods and their applications in food reparations.
		<b>iii</b>	To study the plant food sources and their importance in human nutrition
		<b>iv</b>	To understand the animal food sources and their importance in human nutrition
		<b>v</b>	To understand the balanced diet and its importance.
<b>8</b>	Theory – 8  Textile Science and Apparel Designing - I	<b>i</b>	To gain knowledge about textile fibres and their use.
		<b>ii</b>	To develop an understanding of various kinds of fabrics, their structure and utility
		<b>iii</b>	To understand the basic elements and principles of design
		<b>iv</b>	To gain knowledge in the selection of clothing and wardrobe planning
		<b>v</b>	To know the concept of fashion and its terminologies and to learn the basic figure drawing and illustration.
<b>9</b>	Theory – 9  Extension Education	<b>i</b>	To make the students understand the principles of extension.
		<b>ii</b>	To understand the ways and means of home science extension.
		<b>iii</b>	Develop skills in preparing and using audio-visual aids in extension work.

		<b>iv</b>	Understand the process of communication in Home Science Education.
<b>10</b>	Theory – 10	<b>i</b>	To gain knowledge about basic facts and principles of psychology.
	General Psychology	<b>ii</b>	To understand the biological basis of behaviour, nature of sensation and perception.
		<b>iii</b>	To impart knowledge about learning, memory and forgetting.
		<b>iv</b>	To understand the basic concepts of intelligence and personality.
<b>11</b>	Theory – 11	<b>i</b>	To Impart knowledge in the field of clinical nutrition
	Clinical Nutrition and Dietetics	<b>ii</b>	Be able to make appropriate dietary modifications for various disease conditions based on the pathophysiology
		<b>iii</b>	To develop capacity and aptitude for taking up dietetics as a profession
		<b>iv</b>	Understand the consequence of nutritional problems in the society and have awareness on community nutrition-based programs
<b>12</b>	Theory – 12	<b>i</b>	To impart knowledge on textile dyeing, printing and finishing of fabrics.
	Textile Science and Apparel Designing - II	<b>ii</b>	To understand the types and uses of new generation textiles available in the market.
		<b>iii</b>	To impart knowledge in apparel production, marketing and merchandising.
		<b>iv</b>	To impart knowledge on garment construction
		<b>v</b>	To enable the students to develop skills in pattern making
<b>13</b>	Project	<b>i</b>	To enable the students to understand basic principles of research design
		<b>ii</b>	To enable the students to develop an interest in Home science research.



		iii	To enable the students to analyze the collected data
		iv	To enable the students to prepare the project report.
<b>14</b>	Open Course -1 Applied Counselling	i	To acquaint the students with the concepts of counselling.
		ii	To familiarizes the students with different types and approaches in counselling.
		iii	To enable the students to understand counselling relationship and skills
		iv	To enable the students about the nature and process of counselling
		v	To develop awareness among the students about the application of counselling
<b>15</b>	Practical - I (Part-1) Nutrition and Food Preservation	i	To enable the students for learning by doing the qualitative tests for nutrients
		ii	To enable the students for doing the quantitative measurements of Vitamin C and Calcium in foodstuffs
<b>16</b>	Practical - I (Part 2) Nutrition and Food Preservation	i	To enable the students to understand food preservation by drying
		ii	To enable the students to prepare fruit beverages, squash, jam jelly etc.
		iii	To enable the students to develop skills in the preparation of pickles, wine etc
<b>17</b>	Practical - II (Part 1) Interior Decoration and Family Resource Management	i	To enable the students to understand the application of elements and principles of design in the interior of the house
		ii	To enable the students to develop skills in flower arrangements
		iii	To enable the students to gain practical knowledge for various curtain styles
		iv	To enable the students to utilize their skills in creative arts
<b>18</b>	Practical - II (Part II)	i	To enable the students to manage their time and energy.

	Interior Decoration and Family Resource Management	<b>ii</b>	To enable the students to make a family budget for proper money management.
		<b>iii</b>	To enable the students to gain practical knowledge for using various household equipment.
		<b>iv</b>	To enable the students to gain knowledge regarding consumer rights and responsibilities.
		<b>v</b>	To enable the students to get practical experience of Family Resource Management through residence stay or event management.
<b>19</b>	Practical III (Part-1) Food Science, Nutrition and Dietetics	<b>i</b>	To enable the students to gain knowledge regarding the stages of cookery, the effect of cooking, gluten formation etc.
		<b>ii</b>	To enable the students to plan a balanced diet for the different age group of children.
		<b>iii</b>	To enable the students to plan a balanced diet for an adult man, women and pregnant and lactating women.
		<b>iv</b>	To enable the students to assess the nutritional status through anthropometry.
		<b>v</b>	To enable the students to identify nutritional deficiency disorders among students
<b>20</b>	Practical IV (Part-1) Textile Science and Apparel Designing	<b>i</b>	To enable the students to familiarise and identify different fabric material their fibres.
		<b>ii</b>	To develop an understanding of basic weaves and their identification
		<b>iii</b>	To enable the students to develop skills in stitches and garment construction process
		<b>iv</b>	To enable the students to design formal and party wear for teenagers and preschoolers.
<b>21</b>	Practical III (Part-II)	<b>i</b>	To enable the students to develop skills in preparing therapeutic recipes.

	Food Science, Nutrition and Dietetics		
		ii	To impart knowledge for planning diets for people in different conditions.
		iii	To enable the students to provide an opportunity to learn by observing.
22	Practical IV (Part-II) Textile Science and Apparel Designing	i	To enable the students to understand basic principles of research design
		ii	To enable the students to develop an interest in Home science research.
		iii	To enable the students to analyze the collected data
		iv	To enable the students to prepare the project report.

### Details

- **Programme outcome:** It is attained in the period of UG / PG Programme -common to all UG courses (common for all PG courses).
- **Programme specific outcome:** For each UG programme, it is different. Programme specific outcomes of B.Sc Mathematics and B.Sc Physics are different.
- **Course outcome:** Paper (course) wise outcome. In the case of Mathematics their are 14 core courses, 8 complementary courses and one open course.
- Use the 2014 syllabus to prepare PO, PSO and CO for the academic year 2018-19.
- Use the 2019 syllabus to prepare PO, PSO and CO for the academic year 2019-20.
- Programme Outcome, Programme Specific Outcome and Course Outcome are included in the 2019 syllabus. Collect course outcomes of each paper (course) and consolidate the same.
- It will be uploaded on the college website.

## **Programme Outcome, Programme Specific Outcome and Course Outcome**

**Name of the Department: Mathematics**

**2014-2018 Admission (BSc Mathematics)**

### **Programme Outcomes**

- (i) Critical Thinking**
- (ii) Effective Citizenship**
- (iii) Effective Communication**
- (iv) Interdisciplinarity**

### **Programme Specific Outcomes**

- (i)** Understand the basic concepts and tools of Mathematical logic, Set theory, Number theory, Geometry, Calculus, Algebra, Abstract structures, Linear Algebra, Analysis, Laplace transforms, Fourier series, Graph theory, and Optimization and methods of proofs.
- (ii)** Model real-world problems into Mathematical problems and find solutions and understand the application of Mathematics in other Sciences and Engineering.

### **Course Outcome**

<b>Sl. No.</b>	<b>Name of Course (paper)</b>
<b>1</b>	<b>1B01 MAT: Differential Calculus</b>
<b>2</b>	<b>2B02 MAT :Integral Calculus</b>
<b>3.</b>	<b>3B03 MAT: Elements ofMathematics I</b>

4.	<b>4B04 MAT</b> :Elements ofMathematics II
5	<b>5B05 MAT</b> : Real Analysis
6.	<b>5B06 MAT</b> : Abstract Algebra
7.	<b>5B07 MAT</b> Differential Equations,Laplace transform and Fourier Series
8	<b>5B08 MAT</b> :Vector Calculus
9	<b>5B09 MAT</b> :Graph Theory
10	<b>6B10 MAT</b> : Linear Algebra
11	<b>6B11 MAT</b> :Numerical Methods and Partial Differential Equations
12	<b>6B12 MAT</b> : Complex Analysis
13	<b>6B13 MAT</b> :Mathematical Analysis and Topology
14	<b>6B14A MAT</b> : Operations Research
<b>Open Courses- Mathematics</b>	
	<b>5D04 MAT</b> Linear Programming
<b>Complementary Courses</b>	

<b>1</b>	<b>1C01 MAT-PH:</b> Mathematics for Physics and Electronics I
<b>2</b>	<b>2C02 MAT-PH:</b> Mathematics for Physics and Electronics II
<b>3.</b>	<b>3C03 MAT-PH:</b> Mathematics for Physics and Electronics III
<b>4.</b>	<b>4C04 MAT-PH:</b> Mathematics for Physics and Electronics IV
<b>5</b>	<b>1C01 MAT-CH:</b> Mathematics for Chemistry I
<b>6.</b>	<b>2C02 MAT-CH:</b> Mathematics for Chemistry II
<b>7.</b>	<b>3C03 MAT-CH:</b> Mathematics for Chemistry III
<b>8</b>	<b>4C04 MAT-CH:</b> Mathematics for Chemistry IV

## **2019 Admission Onwards (BSc Mathematics)**

### **Programme Outcomes**

- (i) Critical Thinking**
- (ii) Effective Citizenship**
- (iii) Effective Communication**
- (iv) Interdisciplinarity**

### **Programme Specific Outcomes**

- (i)** Understand the basic concepts and tools of Mathematical logic, Set theory,

Number theory, Geometry, Calculus, Algebra, Abstract structures,

Linear Algebra, Analysis, Laplace transforms, Fourier series, Graph theory, and Optimization and methods of proofs.

- (ii)** Model real-world problems into Mathematical problems and find solutions

and understand the application of Mathematics in other Sciences and Engineering.

### **Course Outcome**

<b>Sl. No.</b>	<b>Name of Course (paper)</b>	<b>Outcomes</b>	
<b>1</b>	<b>CORE COURSE 1:  SET THEORY, DIFFERENTIAL CALCULUS AND NUMERICAL METHODS</b>	<b>1</b>	Understand Relations and Functions
		<b>2</b>	Understand the limit of a function, limit laws, continuity, Inverse functions and their derivatives
		<b>3</b>	Understand successive differentiation and Leibnitz theorem

			Understand functions of several variables, limit and continuity, partial derivatives, chain rule, homogenous functions and Euler's theorem on homogenous functions
		4	Understand bisection method, Regula-false method and Newton-Raphson method to solve algebraic and transcendental equations
2	<b>CORE COURSE 2: INTEGRAL CALCULUS AND LOGIC</b>	1	Understand Hyperbolic functions
		2	Understand Reduction formulae for trigonometric functions and evaluation of definite integrals.
		3	Understand Polar coordinates
		4	Understand Double integrals in Cartesian and polar form.
		5	Understand triple integrals in rectangular, cylindrical and spherical coordinates
		6	Understand Substitution in multiple integrals
		7	Understand Numerical integration: Trapezoidal rule, Simpson's 1/3 <sup>rd</sup> rule
		8	Understand Logic and methods of proofs
		9	Understand Propositional functions, truth set and Negation of quantified statements



<b>3</b>	<b>CORE COURSE 3:  ANALYTIC GEOMETRY AND APPLICATIONS OF DERIVATIVES</b>	<b>1</b>	Understand cartesian equation of conics, eccentricity, polar equations for a conic, lines, circles
		<b>2</b>	Understand Tangents, Normals and Asymptotes
		<b>3</b>	Understand Curvature, Radius of curvature, Centre of Curvature, Circle of curvature and Evolutes of Cartesian and polar curves,
		<b>4</b>	Understand Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem and Taylors Theorem.
		<b>5</b>	Understand extreme values of functions, monotonic functions, first derivative test, concavity and curve sketching.
		<b>6</b>	Understand Indeterminate forms.
<b>4</b>	<b>CORE COURSE 4:  NUMBER THEORY AND APPLICATIONS OF INTEGRALS</b>	<b>1</b>	Understand Division algorithm, Greatest common Divisor, Euclidean Algorithm, Diophantine equation $ax+by=c$ .
		<b>2</b>	Understand Primes and their distribution, fundamental theorem of arithmetic, the sieve of Eratosthenes
		<b>3</b>	Understand Basic properties of congruence.

		<b>4</b>	Understand Picard's little theorem, Wilson's theorem and Euler's theorem.
		<b>5</b>	Understand Substitution and the area between curves, Arc length, Areas and length in polar coordinates.
		<b>6</b>	Understand Volumes using cross-sections, volumes using cylindrical shells and areas of surfaces of revolution.

<b>5</b>	<b>CORE COURSE 5: SET THEORY, THEORY OF EQUATIONS AND COMPLEX NUMBERS</b>	<b>1</b>	Understand finite and infinite sets, Countable and Uncountable sets, Cantor's theorem.
		<b>2</b>	Understand Roots of equations, Relations connecting the roots and coefficients of an equation, Transformation of equations, The cubic equation, Character and position of roots of an equation.
		<b>3</b>	Understand Descarte's rule of signs, De Gua's Rule, Limits to the roots of an equation, Rational roots of equations, Newton's method of divisors, Symmetric functions of roots of an equation, Symmetric functions involving only the difference of the roots of $f(x)=0$ , Equations whose roots are symmetric functions.
		<b>4</b>	Understand Reciprocal equations.
		<b>5</b>	Understand Cubic equation, Equation whose roots are the squares of the difference of the roots, Character of the Roots, Cardan's Solution.
		<b>6</b>	Understand Roots of complex numbers, General form of De Moivre's theorem, the $n^{\text{th}}$ roots of unity, the $n^{\text{th}}$ roots of -1, Factors of $x^n-1$ and $x^n+1$ , the imaginary cube roots of unity.

		<b>7</b>	Understand polar form of complex numbers, powers and roots
<b>6</b>	<b>CORE COURSE 6: REAL ANALYSIS I</b>	<b>1</b>	Understand Algebraic Properties, Order Properties and Absolute values of $\mathbb{R}$ . Understand the Completeness Property of $\mathbb{R}$ and its applications to derive Archimedean Property and Density theorem.
		<b>2</b>	Understand intervals in the real line.
		<b>3</b>	Understand Sequences and their Limits, Limit Theorems, Monotone Sequences.
		<b>4</b>	Understand Subsequences and the Bolzano-Weierstrass Theorem, The Cauchy Criterion.
		<b>5</b>	Understand Infinite Series, Absolute Convergence.
		<b>6</b>	Understand Comparison test, Root test, Ratio test, Integral test and Raabe's test for Absolute convergence.
		<b>7</b>	Understand Alternating series test, Dirichlet's test and Abel's test for Non-Absolute convergence.
		<b>8</b>	Understand Continuous Functions, the composition of continuous functions and continuous functions on intervals.

<b>7</b>	<b>CORE COURSE 7: ABSTRACT ALGEBRA</b>	<b>1</b>	Understand the definition and elementary properties of Groups, Subgroups and Cyclic groups.
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		<b>2</b>	Understand Groups of Permutations, orbits, Alternating groups and theorem of Lagrange.
		<b>3</b>	Understand group homomorphisms, factor Groups
		<b>4</b>	Understand Fundamental Homomorphism Theorems.
		<b>5</b>	Understand the definition and properties of rings and fields
		<b>6</b>	Understand Ring homomorphisms and isomorphisms
		<b>7</b>	Understand zero divisors, integral domains, characteristic of a ring and their properties.
<b>8</b>	<b>CORE COURSE 8: DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS</b>	<b>1</b>	Understand Separable ODEs, Exact ODEs, Linear ODEs, Bernoulliequation and methods to solve these ODEs.
		<b>2</b>	Understand the theorem of Existence and Uniqueness of solutions of first and second-order ODEs.
		<b>3</b>	Understand Homogeneous Linear ODEs of Second Order and solve homogeneous linear ODEs of second order with constant coefficients and Euler-Cauchy equation.
		<b>4</b>	Understand Nonhomogeneous ODEs and solve by variation of parameters.
		<b>5</b>	Understand Laplace Transform and inverse Laplace Transformation.

		<b>6</b>	Understand The first and The second shifting theorems and their applications.
		<b>7</b>	Understand the methods to find Laplace transforms of derivatives and integrals of functions.
		<b>8</b>	Understand the method of differentiating and integrating Laplace transform.
		<b>9</b>	Solve ordinary differential equations and integral equations using Laplace transform.

<b>9</b>	<b>CORE COURSE 9:  VECTOR CALCULUS</b>	<b>1</b>	Understand lines and planes in space
		<b>2</b>	Understand curves in space, their tangents, normal, curvature, the tangential and normal curvature of acceleration.
		<b>3</b>	Understand Directional derivatives and gradient vectors, tangent planes and differentials. Solve extreme value problems using Lagrange multipliers.
		<b>4</b>	Understand Partial derivatives with constrained variables and Taylor's formula for two variables.
		<b>5</b>	Understand Line integrals. Solve for work, circulation and flux using line integrals.

		<b>6</b>	Understand path independence conservative fields and potential functions.
		<b>7</b>	Understand Green's theorem and solve problems using Green's theorem.
		<b>8</b>	Understand Surface area and surface integrals.
		<b>9</b>	Understand Stoke's theorem and solve problems using Stoke's theorem.
		<b>10</b>	Understand the Divergence theorem and solve problems using the Divergence theorem.
<b>10</b>	<b>CORE COURSE 10: REAL ANALYSIS II</b>	<b>1</b>	Understand Uniform Continuity, Monotone and Inverse Functions and Interchange of Limits
		<b>2</b>	Understand Riemann Integral and Riemann-integrable Functions
		<b>3</b>	Understand Fundamental Theorem of Calculus.
		<b>4</b>	Understand Improper Integrals.
		<b>5</b>	Understand Beta and Gamma Functions and their properties.
		<b>6</b>	Understand Transformations of Gamma Function and Duplication formula.

		7	Understand Pointwise and Uniform Convergence of a sequence of functions.
		8	Understand Series of Functions.
			Understand the concept of Metric Spaces

11	<b>CORE COURSE 11: COMPLEX ANALYSIS</b>	1	Understand Analytic Function, Cauchy–Riemann Equations. Laplace’s Equation.
		2	Understand Exponential Function, Trigonometric Functions, Hyperbolic Functions, Logarithmic functions and General Power of complex numbers.
		3	Understand line integral in the complex plane, Cauchy’s integral theorem, Cauchy’s integral formula and derivatives of analytic functions
		4	Understand convergence of Sequences and Series of complex functions.
		5	Understand power series, functions given by power series, Taylor series, Maclaurin’s Series and Laurent Series.
		6	Understand singularities and zeros of complex functions
		7	Understand residue integration method and integrate real integrals.

<b>12</b>	<b>CORE COURSE 12: NUMERICAL METHODS, FOURIER SERIES AND PARTIAL DIFFERENTIAL EQUATIONS</b>	<b>1</b>	Understand Interpolation techniques: Interpolation with unevenly spaced points, Lagrange interpolation, Newton's divided differences interpolation, Finite-difference operators and finite differences, Newton's interpolation formulae and Central difference interpolation.
		<b>2</b>	Understand Numerical differentiation using different formulae.
		<b>3</b>	Understand Picard's method, Solution by Taylor series method, Euler method and Runge- Kutta methods.
		<b>4</b>	Understand Fourier Series: Arbitrary period, Even and Odd Functions, Half-Range Expansions and Fourier Integrals.
		<b>5</b>	Understand Partial Differential equations Solution by Separating Variables.
		<b>6</b>	Understand the use of Fourier Series in solving PDE: D'Alembert's Solution of the Wave Equation. Characteristics and solving Heat Equation by Fourier Series.
		<b>7</b>	Understand Laplacian in Polar Coordinates

<b>13</b>	<b>CORE COURSE 13: LINEAR ALGEBRA</b>	<b>1</b>	Understand the concept of Vector spaces, subspaces, linear combinations and system of equations.
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		2	Understand the concept of Linear Dependence and Linear Independence, Bases and Dimension, Maximal Linearly Independent Subsets and solves problems.
		3	Understand the concept of Linear Transformations, Null Spaces, and Ranges, The Matrix Representation of a Linear Transformation.
		4	Understand Rank of a matrix, Elementary transformations of a matrix, Invariance of rank through elementary transformations, Normal form, Elementary matrices.
		5	Understand the concept System of linear homogeneous equations Nullspace and nullity of the matrix, Range of a matrix, Systems of linear non-homogeneous equations.
		6	Understand Eigenvalues, Eigenvectors, Properties of Eigenvalues, Cayley-Hamilton theorem.
14	<b>DISCIPLINE SPECIFIC ELECTIVE COURSE: 6B14B MAT: OPERATIONS RESEARCH</b>	1	Understand convex sets, convex functions, their properties, local and global extrema and quadratic forms without saddle point, Graphic solution of $2 \times n$ and $m \times 2$ games and Arithmetic method for $n \times n$ Games.
		2	Understand LPP, formulate and solve using graphical method
		3	Understand General LPP, canonical and standard forms of LPP

		<b>4</b>	Understand simplex method and solve LPP
		<b>5</b>	Understand basic solution, degenerate solution, basic feasible solution, optimum basic feasible solution, fundamental properties of the solution and simplex method
		<b>6</b>	Understand primal-dual pair, formulation of dual and duality theorems
		<b>7</b>	Understand LP formulation of a transportation problem and its solution
		<b>8</b>	Understand Mathematical formulation of an Assignment problem and the Hungarian Assignment method
		<b>9</b>	Understand the problem of sequencing, Processing 'n' jobs through '2' machines, Processing 'n' jobs through 'k's machines
		<b>10</b>	Understand basic terms in Game theory, The Maximin-Minimax Principle, the Solution of the game with saddle point, Solution of the 2x2 game.

## COMPLEMENTARY ELECTIVE COURSES

1	<b>MATHEMATICS FOR PHYSICS I</b>	<ol style="list-style-type: none"> <li>1. Understand the concept of Differentiation and successive differentiation.</li> <li>2. Understand Fundamental theorem – Rolle’s theorem, Lagrange’s mean-value theorem, Cauchy’s mean-value theorem.</li> <li>3. Understand Taylor’s theorem, expansions of functions Maclaurin’s series, expansion by use of known series</li> <li>4. Understand the Matrices and System of Equations, Linear Transformations.</li> <li>5. Understand the Rank of a matrix, elementary transformations, the normal form of a matrix, the inverse of a matrix, solution of a linear system of equations.</li> <li>6. Understand Linear transformations, orthogonal transformation, vectors – linear dependence.</li> <li>7. Understand Derivative of arc, curvature, Polar coordinates, Cylindrical and Spherical coordinates.</li> </ol>
2.	<b>MATHEMATICS FOR PHYSICS II</b>	<ol style="list-style-type: none"> <li>1. Understand partial derivatives, homogeneous functions, Euler’s theorem, total derivative, differentiation of implicit functions, change of variables.</li> <li>2. Understand Integration and Integration by Successive Reduction, Integration of Trigonometric Functions</li> <li>3. Comprehend Applications of Integration</li> <li>4. Comprehend Eigenvalues, Eigenvectors, properties of Eigenvalues,</li> <li>5. Understand Cayley- Hamilton theorem, Diagonal form, the similarity of matrices, powers of a matrix, canonical form, nature of a quadratic form.</li> </ol>

3.	<b>MATHEMATICS FOR PHYSICS III</b>	<p>1.Understand the concept of Multiple Integrals and solves Problems.</p> <p>2. Understand Vector Differentiation.</p> <p>3.Understand Laplace Transforms and its Applications</p> <p>4.Understand Fourier Series and Half range expansions</p>
4.	<b>MATHEMATICS FOR PHYSICS IV</b>	<p>1.Understand Wave Equation, Solution by Separating Variables, D-Alembert's solution of the wave equation.</p> <p>2.Understand Heat Equation and Solution by Fourier Series</p> <p>3.Understand Line integrals, path independence, conservative fields and potential functions, Green's theorem in the plane.</p> <p>4.Understand Surface area, surface integrals, Stoke's theorem, Divergence theorem</p> <p>5.Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule</p> <p>6. Understand Numerical Solutions of Ordinary Differential Equations by Taylor's series, Euler's Method, Modified Euler's method, Runge-Kutta methods.</p>

<p><b>5.</b></p>	<p><b>MATHEMATICS FOR CHEMISTRY I</b></p>	<ol style="list-style-type: none"> <li><b>1.</b> Understand Successive differentiation and Leibnitz's theorem for the <math>n</math>th derivative of the product of two functions.</li> <li><b>2.</b> Understand Fundamental theorem – Rolle's theorem, Lagrange's mean-value theorem and Cauchy's mean value theorem.</li> <li><b>3.</b> Understand Taylor's theorem, expansions of functions – Maclaurin's series, expansion by use of known series and Taylor's series.</li> <li><b>4.</b> Understand the method of finding limits of indeterminate forms.</li> <li><b>5.</b> Understand Polar, Cylindrical and Spherical Coordinates.</li> <li><b>6.</b> Understand the Rank of a matrix, elementary transformation of a matrix, equivalent matrices, elementary matrices, Gauss-Jordan method of finding the inverse, normal form of a matrix and partition method of finding the inverse.</li> <li><b>7.</b> Understand solution of a linear system of equations – method of determinants – Cramer's rule, matrix inversion method, consistency of the linear system of equations, Rouche's theorem, a procedure to test the consistency of a system of equations in <math>n</math> unknowns, a system of linear homogeneous equations.</li> <li><b>8.</b> Understand Linear transformations, orthogonal transformation and linear dependence of vectors.</li> <li><b>9.</b> Understand methods of curve fitting, graphical method, laws reducible to the linear law, principles of least squares, method of least squares and apply the principle of least squares to fit the straight</li> </ol>
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		line $y=a+bx$ , to fit the parabola $y=a+bx+cx^2$ , to fit $y=ax^b$ , $y=ae^{bx}$ and $xy_n=b$ .
	<b>MATHEMATICS FOR CHEMISTRY II</b>	<p>1. Understand Functions of two or more variables, limits and continuity.</p> <p>2. Understand partial derivatives, homogeneous functions, Euler's theorem on homogeneous functions, total derivative, differentiation of implicit functions and change of variables.</p> <p>3. Understand Reduction formulae for trigonometric functions and evaluation of definite integrals.</p> <p>4. Understand Substitutions and the area between curves, arc length, areas and length in polar coordinates.</p> <p>5. Understand Double and Iterated Integrals over rectangles, double integrals over general regions, area by double integration, double integrals in polar form and triple integrals in rectangular coordinates.</p> <p>6. Understand Eigenvalues, Eigenvectors, properties of Eigenvalues, Cayley- Hamilton theorem, reduction to diagonal form, the similarity of matrices, powers of a matrix, reduction of quadratic form to canonical form and nature of a quadratic form.</p>

7	<b>MATHEMATICS FOR CHEMISTRY III</b>	<ol style="list-style-type: none"> <li>1. Understand Ordinary differential equations, Geometrical meaning of <math>y'=f(x, y)</math> and Direction Fields.</li> <li>2. Understand Methods of solving Differential Equations: Separable ODEs, Exact ODEs, Integrating Factors, Linear ODEs and Bernoulli Equation.</li> <li>3. Understand Orthogonal Trajectories, Existence and Uniqueness of Solutions.</li> <li>4. Understand Second-order ODEs, Homogeneous Linear ODEs of second-order, Homogeneous Linear ODEs with constant coefficients, Differential Operators, Euler-Cauchy Equation, Existence and Uniqueness of Solutions – Wronskian, Nonhomogeneous ODEs and Solution by variation of Parameters</li> <li>5. Understand Laplace Transform, Linearity, first shifting theorem, Transforms of Derivatives and Integrals, ODEs, Unit step Function, second shifting theorem, Convolution, Integral Equations, Differentiation and integration of Transforms and to solve special linear ODE's with variable coefficients and Systems of ODEs.</li> <li>6. Understand Fourier series, arbitrary period, Even and Odd functions, Half-range Expansions.</li> </ol>
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<b>8.</b>	<b>MATHEMATICS FOR CHEMISTRY IV</b>	<p><b>1.</b> Understand Partial Differential Equations, Modeling, Vibrating String, Wave Equation.</p> <p><b>2.</b> Solve PDE by Separating Variables, by use of Fourier Series, D-Alembert's solution of the wave equation and Heat Equation.</p> <p><b>3.</b> Understand Numerical Integration, Trapezoidal Rule, Simpson's 1/3-Rule</p> <p><b>4.</b> Understand Numerical methods to find Solutions of Ordinary Differential Equations: Solution by Taylor's series, Euler's Method, Modified Euler's method, Runge-Kutta methods.</p> <p><b>5.</b> Understand volumes of solid using cross-sections and areas of surfaces of revolution</p>
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#### **GENERIC ELECTIVE COURSE**

<b>1</b>	<b>LINEAR PROGRAMMING</b>	<p><b>1.</b> Understand General linear programming problem – canonical and standard forms of L.P.P, Solutions and fundamental properties of solutions of LPP.</p> <p><b>2.</b> Understand Graphical solution method, Simplex method, Duality in linear programming, Formulating a dual problem.</p> <p><b>3.</b> Understand General transportation problem, the transportation tables, Loops in transportation table and solves the transportation problem</p> <p><b>4.</b> Understand Degeneracy in transportation problem, Transportation algorithm (MODI method) and solves problems</p>
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## **Details**

- **Programme outcome:** It is attained in the period of UG / PG Programme -common to all UG courses (common for all PG courses).
- **Programme specific outcome:** For each UG programme, it is different. Programme specific outcomes of B.Sc Mathematics and B.Sc Physics are different.
- **Course outcome:** Paper (course) wise outcome. In the case of Mathematics there are 14 core courses, 8 complementary courses and one open course.
- Use the 2014 syllabus to prepare PO, PSO and CO for the academic year 2018-19.
- Use the 2019 syllabus to prepare PO, PSO and CO for the academic year 2019-20.
- **Programme Outcome, Programme Specific Outcome and Course Outcome** are included in the 2019 syllabus. Collect course outcomes of each paper (course) and consolidate the same.
- It will be uploaded on the college website.

# **Programme Outcome, Programme Specific Outcome and Course Outcome**

**Name of the Department: Chemistry**

**2014 -2018 Admission (BSc Chemistry)**

## **Critical Thinking:**

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

## **2.Effective Citizenship:**

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the postcolonial society.

## **3.Effective Communication:**

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

#### **4. Interdisciplinarity:**

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

### **Programme Specific Outcomes**

1. Understand the fundamental concepts, principles and processes underlying the academic field of chemistry, its different subfields (analytical, inorganic, organic and physical), and its linkages with related disciplinary areas/subjects;

2. Demonstrate procedural knowledge that creates different types of professionals in the field of chemistry and related fields such as pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.;

3. Employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments and get an awareness of the impact of chemistry on the environment and the society.

4. Use chemical techniques relevant to academia and industry, generic skills and global competencies, including knowledge and skills that enable students to undertake further studies in the field of chemistry or a related field, and work in the chemical and non-chemical industry sectors.

5. Undertake hands on lab work and practical activities which develop problem solving abilities required for successful career in pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.

6. Understand safety of chemicals, transfer and measurement of chemical, preparation of solutions, and find out the green route for chemical reaction for sustainable development.

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

### Course Outcome

Sl. No.	Name of Course (paper)	Outcomes
1	<b>1B01CHE-Theoretical and Inorganic Chemistry</b>	<ol style="list-style-type: none"><li>1. Correlate the structure and behavior of atom</li><li>2. Differentiate the various chemical interactions in molecules through bonding concepts</li><li>3. Analyze and interpret the gradation in the properties of elements in the periodic table</li><li>4. Predict the nuclear transmutations CO5: identify the role of radioactive materials in different applications</li></ol>
2	<b>2B03CHE- Analytical &amp; Inorganic Chemistry 1</b>	<ol style="list-style-type: none"><li>1. Determine the error, standard deviation and relative standard deviation of analytical data.</li><li>2. Understand statistical treatment of analytical data and the principles underlying volumetric titrations.</li><li>3. Understand basic principles behind selective precipitation of cation.</li><li>4. Summarize the characteristics of s- and p- block elements</li><li>5. Compare the various concepts of acids and bases</li></ol>
3	<b>1B02CHE&amp; 2B02CHE- Practical 1- Volumetric Analysis</b>	<ol style="list-style-type: none"><li>1. Apply the theoretical concepts while performing experiments.</li><li>2. Acquire practical skill to estimate acid, base, oxidizing</li></ol>

		<p>agents etc by volumetric titration method</p> <ol style="list-style-type: none"> <li>Estimate the metallic ions by complexometric titration method</li> <li>Acknowledge experimental errors and their possible sources.</li> <li>Able to prepare inorganic complexes</li> <li>Design, carry out, record and analyze the results of chemical experiments</li> </ol>
4	<b>3B04CHE- Organic Chemistry -1</b>	<ol style="list-style-type: none"> <li>Explain the types of electron displacement in organic molecules and predict the properties of molecules based on electron displacement effect.</li> <li>Distinguish aromatic, anti aromatic and nonaromatic compounds and ions and analyse the mechanistic details of aromatic electrophilic substitution</li> <li>Classify stereo isomers, understand the property of chirality, apply CIP rules to recognize the configuration and explain the stability of conformations drawing energy profile diagram</li> <li>Explain the mechanism of polymerization, synthesis and application of industrially important Polymers</li> <li>Explain the classification and the methods of preparation of important dyes</li> <li>Illustrate the preparative methods and synthetic applications of important synthetic reagents</li> </ol>
5	<b>4B06CHE-Organic Chemistr-2</b>	<ol style="list-style-type: none"> <li>Describe mechanisms for substitution and elimination reactions, and predict the effect of nucleophile, leaving group, and solvent on the relative rates of SN1 versus SN2 reactions, and E1 versus E2 reactions, as well as on the relative rates of substitution versus elimination.</li> <li>Explain Chugaev and Cope eliminations and E1CB mechanism</li> <li>Illustrate the preparative methods and important properties of Hydrocarbons, halogen compounds, Hydroxy compounds and Carbonyl Compounds</li> <li>Explain the mechanism of important name reactions including rearrangements involving hydroxyl and</li> </ol>

		Carbonyl functional groups
6	<b>3B05CHE &amp; 4B05CHE- Practicals 2- Inorganic Qualitative Analysis</b>	<ol style="list-style-type: none"> <li>1. Apply the theoretical concepts while performing experiments.</li> <li>2. Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts</li> <li>3. Able to design, carry out, record and analyze the results of chemical experiments</li> <li>4. Learns the effective usage of chemicals</li> </ol>
7	<b>5B07CHE- Inorganic Chemistry 1</b>	<ol style="list-style-type: none"> <li>1. Familiarize with the preparation, properties and uses of some inorganic compounds like hydrides of boron, sulphur and silicon based inorganic polymers and understand their importance</li> <li>2. Explain the classification of refractories.</li> <li>3. Know the position, electronic configuration and physical properties of noble gases and explain hybridization and geometry of different xenon compounds</li> <li>4. Explain various steps involved in metallurgical operations and power metallurgy and understand Corrosion, theories of Corrosion and factors affecting Corrosion</li> </ol>
8	<b>5B08CHE- Inorganic Chemistry 2</b>	<ol style="list-style-type: none"> <li>1. Understand the behavior of transition and inner transition elements and explain the separation of lanthanides by ion exchange method and lanthanide contraction</li> <li>2. Understand key features of co-ordination compounds and illustrate the theories of coordination complexes, stability of complexes and explain factors affecting crystal field splitting.</li> <li>3. Explain biological functions of metal ions.</li> <li>4. Familiarize new elements in periodic table and Understand recent developments in inorganic chemistry</li> </ol>
9	<b>5B09CHE- Physical Chemistry 1</b>	<ol style="list-style-type: none"> <li>1. Recognize and relate the properties of ideal and real gases</li> <li>2. Describe the properties of liquids.</li> <li>3. Identify and distinguish the types of solutions</li> <li>4. Explain colligative properties of dilute solution and determine the molecular weight of a solute</li> <li>5. Identify different crystallographic systems and various types of crystal defects</li> <li>6. Describe X ray diffraction to explain internal structure of</li> </ol>

		solids
10	<b>5B010CHE- Physical Chemistry 2</b>	<ol style="list-style-type: none"> <li>1. Identify the fundamental concepts of thermodynamics</li> <li>2. Relate and Interpret the various laws of thermodynamics</li> <li>3. Understand the concept of entropy and how the whole universe is related to it.</li> <li>4. Construct phase diagrams and study the equilibrium exists between various states of matter.and apply principles phase diagram to separation processes and for property modification of different type of system.</li> <li>5. Understand basic principles of surface chemistry and its application in various fields</li> <li>6. Correlate the types of colloids with its properties and to explore the applications in day today life.</li> </ol>
11	<b>6B14CHE- Organic Chemistry 3</b>	<ol style="list-style-type: none"> <li>1. Acquaint with the classification, structures and properties of carbohydrates,explain the configuration of glucose and fructose, their inter conversion , illustrate Killiani-Fischer synthesis and Ruff degradation</li> <li>2. Illustrate the preparative methods and the properties of different classes of organic acids , nitrogen containing compounds and heterocyclic compounds .</li> <li>3. Classify amino acids and peptides and explain the synthesisof simple peptides by Nprotection (t-butyloxycarbonyl and phthaloyl) &amp;C-activating groups and Merrifield solidphase synthesis.Explain the methods of determination of primary structure of peptides</li> <li>4. Distinguish the components of nucleic acids and lipids and their roles in biological system and the biological importance of various natural products .Familiarise with important drugs and their therapeutic applications</li> <li>5. Recognisethe types and characteristics of pericyclic reaction and analyse the pericyclic reactions by FMO methods. Understand the photochemistry of carbonyl compounds</li> <li>6. Understand the principles of Green Chemistry and the importance of green synthesis and recognize the impact of</li> </ol>

		green chemistry on human health and the environment
<b>12</b>	<b>6B15CHE- Physical Chemistry 3</b>	<ol style="list-style-type: none"> <li>1. Understand the mechanism of electrical conductance, theories of electrical conductance, and conductometric titrations</li> <li>2. Understand the basic principle of ionic equilibrium and its application in laboratories</li> <li>3. Design different types of electro chemical cell and able to calculate its potential.</li> <li>4. Familiarise with electro analytical methods</li> <li>5. Acquaint with kinetics of simple, complex, enzymatic and surface reactions</li> <li>6. Understand basic principles of photochemistry and its application in spectrophotometry</li> </ol>
<b>13</b>	<b>6B16CHE – Physical Methods in Chemistry</b>	<ol style="list-style-type: none"> <li>1. i) Explain the important principles of spectroscopy ii) Apply spectroscopic techniques in analyzing the structure of simple organic molecules</li> <li>2. Acquainting the working principles of various instruments and their functions</li> <li>3. Understand the basic principles of symmetry and group theory and its applications in chemistry</li> <li>4. Study the basic principles of nanochemistry and understand the various nanofabrication methods</li> <li>5. Explain the important principles for quantum chemical and molecular mechanic methods of computing the geometry and energy of molecules</li> </ol>
<b>14</b>	<b>6B17CHE/PCH A- Environmental Chemistry</b>	<ol style="list-style-type: none"> <li>1. Know the importance of environmental studies and methods of conservation of natural resources</li> <li>2. Describe the structure and function of an ecosystem and explain the values and Conservation of bio-diversity.</li> <li>3. Explain the sources, environmental effects and control measures of various types of pollutions.</li> <li>4. Identify the toxic chemicals in environment and understand the sources, effects and treatment of heavy metal poisoning</li> <li>5. Understand the methods of domestic water treatment , Sewage analysis and Sewage treatment</li> </ol>
<b>15</b>	<b>5B11CHE &amp; 6B11CHE-</b>	<ol style="list-style-type: none"> <li>1. Make use of standardised procedures for the Gravimetric</li> </ol>



	<b>Practicals 3- Gravimetric Analysis</b>	<p>analysis</p> <ol style="list-style-type: none"> <li>learn the skills of Precipitation process, digestion, filtration, incineration etc.</li> <li>Acquire practical Knowledge of co-precipitation</li> <li>Handle sintered glass vessels</li> <li>Acknowledge experimental errors and their possible sources.</li> <li>Able to design, carry out, record and analyze the results of chemical experiments</li> </ol>
<b>16</b>	<b>5B12CHE 7 6B122CHE – Practicals 4- Organic Chemistry</b>	<ol style="list-style-type: none"> <li>Apply the theoretical concepts while performing experiments.</li> <li>Acquire practical skill in qualitative analysis of organic compounds</li> <li>Acquire practical skill in preparing organic compounds and in their purification by crystallisation</li> <li>Separate organic compounds in a mixture –by steam distillation, TLC and Column Chromatography</li> <li>Acquire the habit of working safely with the chemicals and handling of equipments</li> </ol>
<b>17</b>	<b>6B18CHE – Practicals 5- Physical Chemistry</b>	<ol style="list-style-type: none"> <li>Acquire practical skill in physical chemistry experiments such as Cryoscopy, Transition Experiments ,Phase Rule Experiments, Conductometric titrations ,Potentiometric titrations , colorimetry and Chemical Kinetics</li> <li>Learn statistical approach for evaluating data</li> <li>Able to carry out and record these experiments in a skilful manner</li> <li>Acquire the habit of working safely with the chemicals and handling of equipments</li> </ol>
<b>18</b>	<b>5B13CHE &amp; 6B13CHE- Project &amp; Industrial Visit</b>	<ol style="list-style-type: none"> <li>Able to enhance the skills of managing the resources, time and team work</li> <li>Students will be able to function as a member of an interdisciplinary problem</li> </ol>
<b>19</b>	<b>5D01CHE – Chemistry in Service to man</b>	<ol style="list-style-type: none"> <li> <ol style="list-style-type: none"> <li>Understandthe classification, structure, function and applications of polymers</li> <li>Understand the importance of biodegradable polymers</li> </ol> </li> <li>Acquaint with different types of fertilizers and pesticides and understand the effect of fertilizers and pesticides on</li> </ol>

		<p>the environment</p> <ol style="list-style-type: none"> <li>3. Explain the classification of fuels and composition of petroleum and familiarise the fuel cells and batteries and Understand their applications in modern life</li> <li>4. Explain different types of glasses ,their applications and the composition of Portland cement</li> <li>5. Identify the harmful chemicals present in cosmetics and understand their effects in human body</li> </ol>
<b>20</b>	<b>1C01CHE – Chemistry (for Physical &amp; Biological Science)</b>	<ol style="list-style-type: none"> <li>1. Understand the atomic structure, basics of quantum chemistry and its applications.</li> <li>2. Explain theories of chemical bonding and molecular structure.</li> <li>3. Classify environmental pollution and recognise the causes of pollution</li> <li>4. Understand the basic concept of Chemical equilibrium and theories of acids and bases</li> <li>5. Calculate pH values</li> <li>6. Explain common ion effect and solubility product</li> </ol>
<b>21</b>	<b>2C02CHE - – Chemistry (for Physical &amp; Biological Science)</b>	<ol style="list-style-type: none"> <li>1. Explain the concept of aromaticity and non-benzenoid aromatics</li> <li>2. Understand the basic concepts of chemical equilibrium . Explain colloids, their properties and applications</li> <li>3. Illustrate the laws of photochemistry and Explain the photochemical phenomena such as Photosensitization, quenching, Fluorescence, Phosphorescence, Chemi luminescence and bioluminescence.</li> <li>4. Familiarise different types of analytical methods in chemistry and explain the principle of colorimetry</li> <li>5. Explain the principles underlying the qualitative and quantitative analysis</li> </ol>
<b>22</b>	<b>3C03CHE-BS – Chemistry (for Biological Science)</b>	<ol style="list-style-type: none"> <li>1. i) Understand the basic concept of Coordination Chemistry, nomenclature, Werner’s coordination theory and Valance bond theory of coordination complexes ii) Write the name of Coordination compounds iii) Explain Werner’s coordination theory and Valance bond theory of coordination complexes iv) Explain the application of</li> </ol>

		<p>coordination complexes</p> <ol style="list-style-type: none"> <li>2. i) Understand the electron displacement effects in organic molecules ii) Explain the mechanism of nucleophilic substitutions and eliminations in alkyl halides iii) Explain the mechanism of aromatic electrophilic substitution reactions</li> <li>3. i) Classify the isomerism in organic molecules ii) Distinguish the geometrical isomers and explain their stability iii) Explain the characteristics of chiral compound iv) Explain the conformational isomers in alkanes and cycloalkanes</li> <li>4. i) Explain the important types of polymerization, thermoplastics and thermosetting plastics ii) Understand the characteristics of biodegradable plastics</li> <li>5. Understand the basic concept of thermodynamics and laws of thermodynamics</li> <li>6. i) Understand the basic concept of chemical kinetics ii) Calculate <math>E_a</math> from the values of <math>k</math> at two temperatures iii) Explain homogeneous catalysis, heterogeneous catalysis and Characteristics of catalysis reactions</li> </ol>
23	<b>3C03CHE-PS – Chemistry (for Physical Science)</b>	<ol style="list-style-type: none"> <li>1. Understand the basic principle underlying various spectroscopy</li> <li>2. Understand the basic concepts of thermodynamics and laws of thermodynamics</li> <li>3. Explain the formation, nomenclature and applications of coordination complexes, Illustrate the valence bond theory of coordination complexes and explain the factors affecting the stability of complexes</li> <li>4. Understand the basic concepts of chemical kinetics and Calculate the value of <math>E_a</math> from the values of <math>k</math> at two temperatures. Illustrate the types of Catalysis and understand the Characteristics of catalytic reactions</li> <li>5. Understand the basic concept of nuclear chemistry, and explain the detection of isotopes using Aston's mass spectrograph and separation of isotopes by diffusion</li> </ol>

		<p>methods</p> <p>6. Explain the principle and applications of different types of Chromatography</p>
24	<b>4C04CHE-BS- Chemistry (for Biological Science)</b>	<p>1. Illustrate the preparatory methods of glucose and fructose and explain their configurations Familiarize the structure and properties of sucrose and poly saccharides</p> <p>2. Know the structure of important five membered and six membered heterocyclic compounds and explain their reactivity and important reactions .Explain the preparation and properties of Quinoline and iso quinoline</p> <p>3. Understand the structure and functions of nucleic acids , Classify amino acids and explain the structure of protein and its importance</p> <p>4. Understand the mechanism of enzyme action , enzyme catalysis</p> <p>5. Know the structure of Vitamin A, B and C. and hormones progesterone, Testosterone, cortisone, adrenaline and Thyroxin</p> <p>6. Understand the importance of metal ions in biological systems and Mechanism of O<sub>2</sub> and CO<sub>2</sub> transportation – Nitrogen Fixation Na-K pump</p>
25	<b>4C04CHE-PS- Chemistry (for Physical Science)</b>	<p>1. Understand the basic concept in gaseous state Explain the deviation of real gases from ideal behavior and Maxwell distribution of velocities and its use in calculating molecular velocities. Distinguish average velocity, RMS velocity and most probable velocity</p> <p>2. Understand the basic concepts of internal structure of Crystals (crystallography) and explain X-ray analysis of crystals</p> <p>3. Understand the basic concepts in liquid state and solutions .Illustrate Henry's law and explain its applications. Identify colligative properties and apply colligative properties to determine molecular mass</p> <p>4. Distinguish Specific conductance – molar conductance and equivalent conductance and explain laws of</p>

		<p>electrolysis , conductometric titrations and its applications</p> <ol style="list-style-type: none"> <li>5. Explain electrochemical cell ,electrode potential , types of electrodes ,EMF Nernst equation and potentiometric titration</li> <li>6. Acquaint with various instrumental methods in chemistry and Understand basic concepts of nanochemistry</li> </ol>
<b>26</b>	<b>4C05CHE- Complementary Chemistry Practical</b>	<ol style="list-style-type: none"> <li>1. Apply the theoretical concepts while performing experiments.</li> <li>2. Acquire practical skill to estimate acid, base, oxidizing agents etc by volumetric titration method</li> <li>3. Acknowledge experimental errors and their possible sources.</li> <li>4. Design, carry out, record and analyze the results of chemical experiments</li> <li>5. Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts</li> <li>6. Learns the effective usage of chemicals</li> </ol>

## **2019 Admission Onwards (BSc Chemistry)**

### **Programme Outcomes**

#### **1.Critical Thinking:**

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### **2.Effective Citizenship:**

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the postcolonial society.

#### **3.Effective Communication:**

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

#### **4. Interdisciplinarity:**

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

### **Programme Specific Outcomes**

1. Understand the fundamental concepts, principles and processes underlying the academic field of chemistry, its different subfields (analytical, inorganic, organic and physical), and its linkages with related disciplinary areas/subjects;

2. Demonstrate procedural knowledge that creates different types of professionals in the field of chemistry and related fields such as pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.;

3. Employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments and get an awareness of the impact of chemistry on the environment and the society.

4. Use chemical techniques relevant to academia and industry, generic skills and global competencies, including knowledge and skills that enable students to undertake further studies in the field of chemistry or a related field, and work in the chemical and non-chemical industry sectors.

5. Undertake hands on lab work and practical activities which develop problem solving abilities required for successful career in pharmaceuticals, chemical industry, teaching, research, environmental monitoring, product quality, consumer goods industry, food products, cosmetics industry, etc.

6. Understand safety of chemicals, transfer and measurement of chemical, preparation of solutions, and find out the green route for chemical reaction for sustainable development.

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

## Course Outcome

Sl. No.	Name of Course (paper)	Outcomes
1	<b>1B01CHE-Theoretical and Inorganic Chemistry</b>	<ul style="list-style-type: none"><li>5. Correlate the structure and behavior of atom</li><li>6. Differentiate the various chemical interactions in molecules through bonding concepts</li><li>7. Analyze and interpret the gradation in the properties of elements in the periodic table</li><li>8. Predict the nuclear transmutations CO5: identify the role of radioactive materials in different applications</li></ul>
2	<b>2B03CHE- Analytical &amp; Inorganic Chemistry 1</b>	<ul style="list-style-type: none"><li>6. Determine the error, standard deviation and relative standard deviation of analytical data.</li><li>7. Understand statistical treatment of analytical data and the principles underlying volumetric titrations.</li><li>8. Understand basic principles behind selective precipitation</li></ul>



		<p>of cation.</p> <p>9. Summarize the characteristics of s- and p- block elements</p> <p>10. Compare the various concepts of acids and bases</p>
3	<b>1B02CHE&amp; 2B02CHE- Practical 1- Volumetric Analysis</b>	<p>7. Apply the theoretical concepts while performing experiments.</p> <p>8. Acquire practical skill to estimate acid, base, oxidizing agents etc by volumetric titration method</p> <p>9. Estimate the metallic ions by complexometric titration method</p> <p>10. Acknowledge experimental errors and their possible sources.</p> <p>11. Able to prepare inorganic complexes</p> <p>12. Design, carry out, record and analyze the results of chemical experiments</p>
4	<b>3B04CHE- Organic Chemistry -1</b>	<p>7. Explain the types of electron displacement in organic molecules and predict the properties of molecules based on electron displacement effect.</p> <p>8. Distinguish aromatic, anti aromatic and nonaromatic compounds and ions and analyse the mechanistic details of aromatic electrophilic substitution</p> <p>9. Classify stereo isomers, understand the property of chirality, apply CIP rules to recognize the configuration and explain the stability of conformations drawing energy profile diagram</p> <p>10. Explain the mechanism of polymerization, synthesis and application of industrially important Polymers</p> <p>11. Explain the classification and the methods of preparation of important dyes</p> <p>12. Illustrate the preparative methods and synthetic applications of important synthetic reagents</p>
5	<b>4B06CHE-Organic Chemistr-2</b>	<p>5. Describe mechanisms for substitution and elimination reactions, and predict the effect of nucleophile, leaving group, and solvent on the relative rates of SN1 versus SN2 reactions, and E1 versus E2 reactions, as well as on the relative rates of substitution versus elimination.</p>

		6. Explain Chugaev and Cope eliminations and E1CB mechanism 7. Illustrate the preparative methods and important properties of Hydro carbons, halogen compounds, Hydroxy compounds and Carbonyl Compounds 8. Explain the mechanism of important name reactions including rearrangements involving hydroxyl and Carbonyl functional groups
6	<b>3B05CHE &amp; 4B05CHE- Practicals 2- Inorganic Qualitative Analysis</b>	5. Apply the theoretical concepts while performing experiments. 6. Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts 7. Able to design, carry out, record and analyze the results of chemical experiments 8. Learns the effective usage of chemicals
7	<b>5B07CHE-Analytical &amp; Inorganic Chemistry 2</b>	5. Understand the qualitative and quantitative aspects of analysis and separation techniques. 6. Explain instrumentation and working principle of different analytical techniques –TGA, DTA and radio chemical method of analysis. 7. Familiarize with the preparation, properties and uses of some inorganic compounds like hydrides of boron, sulphur and silicon based inorganic polymers and understand their importance 8. Explain the classification of refractories. 9. Know the position, electronic configuration and physical properties of noble gases and explain hybridization and geometry of different xenon compounds 10. Explain various steps involved in metallurgical operations and power metallurgy and understand Corrosion, theories of Corrosion and factors affecting Corrosion
8	<b>5B08CHE- Inorganic Chemistry</b>	5. Understand the behavior of transition and inner transition elements and explain the separation of lanthanides by ion exchange method and lanthanide contraction 6. Understand key features of co-ordination compounds and illustrate the theories of coordination complexes, stability

		<p>of complexes and explain factors affecting crystal field splitting.</p> <p>7. Explain biological functions of metal ions.</p> <p>8. Familiarize new elements in periodic table and Understand recent developments in inorganic chemistry</p>
9	<b>5B09CHE- Physical Chemistry 1</b>	<p>7. Recognize and relate the properties of ideal and real gases</p> <p>8. Describe the properties of liquids.</p> <p>9. Identify and distinguish the types of solutions</p> <p>10. Explain colligative properties of dilute solution and determine the molecular weight of a solute</p> <p>11. Identify different crystallographic systems and various types of crystal defects</p> <p>12. Describe X ray diffraction to explain internal structure of solids</p>
10	<b>5B010CHE- Physical Chemistry 2</b>	<p>7. Identify the fundamental concepts of thermodynamics</p> <p>8. Relate and Interpret the various laws of thermodynamics</p> <p>9. Understand the concept of entropy and how the whole universe is related to it.</p> <p>10. Construct phase diagrams and study the equilibrium exists between various states of matter and apply principles phase diagram to separation processes and for property modification of different type of system.</p> <p>11. Understand basic principles of surface chemistry and its application in various fields</p> <p>12. Correlate the types of colloids with its properties and to explore the applications in day today life.</p>
11	<b>6B14CHE- Organic Chemistry 3</b>	<p>7. Acquaint with the classification, structures and properties of carbohydrates, explain the configuration of glucose and fructose, their inter conversion, illustrate Killiani-Fischer synthesis and Ruff degradation</p> <p>8. Illustrate the preparative methods and the properties of different classes of organic acids, nitrogen containing compounds and heterocyclic compounds.</p> <p>9. Classify amino acids and peptides and explain the synthesis of simple peptides by N protection (t-butyloxycarbonyl and phthaloyl) &amp; C-activating groups and Merrifield solid phase synthesis. Explain the methods</p>

		<p>of determination of primary structure of peptides</p> <p>10. Distinguish the components of nucleic acids and lipids and their roles in biological system and the biological importance of various natural products .Familiarise with important drugs and their therapeutic applications</p> <p>11. Recognise the types and characteristics of pericyclic reaction and analyse the pericyclic reactions by FMO methods. Understand the photochemistry of carbonyl compounds</p> <p>12. Understand the principles of Green Chemistry and the importance of green synthesis and recognize the impact of green chemistry on human health and the environment</p>
12	<b>6B15CHE- Physical Chemistry 3</b>	<p>7. Understand the mechanism of electrical conductance, theories of electrical conductance, and conductometric titrations</p> <p>8. Understand the basic principle of ionic equilibrium and its application in laboratories</p> <p>9. Design different types of electro chemical cell and able to calculate its potential.</p> <p>10. Familiarise with electro analytical methods</p> <p>11. Acquaint with kinetics of simple, complex, enzymatic and surface reactions</p> <p>12. Understand basic principles of photochemistry and its application in spectrophotometry</p>
13	<b>6B16CHE – Physical Methods in Chemistry</b>	<p>6. i) Explain the important principles of spectroscopy ii) Apply spectroscopic techniques in analyzing the structure of simple organic molecules</p> <p>7. Acquainting the working principles of various instruments and their functions</p> <p>8. Understand the basic principles of symmetry and group theory and its applications in chemistry</p> <p>9. Study the basic principles of nanochemistry and understand the various nanofabrication methods</p> <p>10. Explain the important principles for quantum chemical and molecular mechanic methods of computing the geometry and energy of molecules</p>

14	<b>6B17CHE/PCH A- Environmental Chemistry</b>	6. Know the importance of environmental studies and methods of conservation of natural resources 7. Describe the structure and function of an ecosystem and explain the values and Conservation of bio-diversity. 8. Explain the sources, environmental effects and control measures of various types of pollutions. 9. Identify the toxic chemicals in environment and understand the sources, effects and treatment of heavy metal poisoning 10. Understand the methods of domestic water treatment , Sewage analysis and Sewage treatment
15	<b>5B11CHE &amp; 6B11CHE- Practicals 3- Gravimetric Analysis</b>	7. Make use of standardised procedures for the Gravimetric analysis 8. learn the skills of Precipitation process, digestion, filtration, incineration etc. 9. Acquire practical Knowledge of co-precipitation 10. Handle sintered glass vessels 11. Acknowledge experimental errors and their possible sources. 12. Able to design, carry out, record and analyze the results of chemical experiments
16	<b>5B12CHE 7 6B122CHE – Practicals 4- Organic Chemistry</b>	6. Apply the theoretical concepts while performing experiments. 7. Acquire practical skill in qualitative analysis of organic compounds 8. Acquire practical skill in preparing organic compounds and in their purification by crystallisation 9. Separate organic compounds in a mixture –by steam distillation, TLC and Column Chromatography 10. Acquire the habit of working safely with the chemicals and handling of equipments
17	<b>6B18CHE – Practicals 5- Physical Chemistry</b>	5. Acquire practical skill in physical chemistry experiments such as Cryoscopy, Transition Experiments ,Phase Rule Experiments, Conductometric titrations ,Potentiometric titrations , colorimetry and Chemical Kinetics 6. Learn statistical approach for evaluating data 7. Able to carry out and record these experiments in a skilful

		<p>manner</p> <p>8. Acquire the habit of working safely with the chemicals and handling of equipments</p>
18	<b>5B13CHE &amp; 6B13CHE- Project &amp; Industrial Visit</b>	<p>3. Able to enhance the skills of managing the resources, time and team work</p> <p>4. Students will be able to function as a member of an interdisciplinary problem</p>
19	<b>5D01CHE – Chemistry in Service to man</b>	<p>6. i) Understand the classification, structure, function and applications of polymers ii) Understand the importance of biodegradable polymers</p> <p>7. Acquaint with different types of fertilizers and pesticides and understand the effect of fertilizers and pesticides on the environment</p> <p>8. Explain the classification of fuels and composition of petroleum and familiarise the fuel cells and batteries and Understand their applications in modern life</p> <p>9. Explain different types of glasses ,their applications and the composition of Portland cement</p> <p>10. Identify the harmful chemicals present in cosmetics and understand their effects in human body</p>
20	<b>1C01CHE – Chemistry (for Physical &amp; Biological Science)</b>	<p>7. Understand the atomic structure, basics of quantum chemistry and its applications.</p> <p>8. Explain theories of chemical bonding and molecular structure.</p> <p>9. Classify environmental pollution and recognise the causes of pollution</p> <p>10. Understand the basic concept of Chemical equilibrium and theories of acids and bases</p> <p>11. Calculate pH values</p> <p>12. Explain common ion effect and solubility product</p>
21	<b>2C02CHE – Chemistry (for Physical &amp; Biological Science)</b>	<p>6. Explain the concept of aromaticity and non-benzenoid aromatics</p> <p>7. Understand the basic concepts of chemical equilibrium . Explain colloids, their properties and applications</p> <p>8. Illustrate the laws of photochemistry and Explain the photochemical phenomena such as Photosensitization, quenching, Fluorescence, Phosphorescence, Chemi</p>

		<p>luminescence and bioluminescence.</p> <p>9. Familiarise different types of analytical methods in chemistry and explain the principle of colorimetry</p> <p>10. Explain the principles underlying the qualitative and quantitative analysis</p>
22	<b>3C03CHE-BS – Chemistry (for Biological Science)</b>	<p>7. i) Understand the basic concept of Coordination Chemistry, nomenclature, Werner's coordination theory and Valence bond theory of coordination complexes  ii) Write the name of Coordination compounds  iii) Explain Werner's coordination theory and Valence bond theory of coordination complexes  iv) Explain the application of coordination complexes</p> <p>8. i) Understand the electron displacement effects in organic molecules  ii) Explain the mechanism of nucleophilic substitutions and eliminations in alkyl halides  iii) Explain the mechanism of aromatic electrophilic substitution reactions</p> <p>9. i) Classify the isomerism in organic molecules  ii) Distinguish the geometrical isomers and explain their stability  iii) Explain the characteristics of chiral compound  iv) Explain the conformational isomers in alkanes and cycloalkanes</p> <p>10. i) Explain the important types of polymerization, thermoplastics and thermosetting plastics  ii) Understand the characteristics of biodegradable plastics</p> <p>11. Understand the basic concept of thermodynamics and laws of thermodynamics</p> <p>12. i) Understand the basic concept of chemical kinetics  ii) Calculate <math>E_a</math> from the values of <math>k</math> at two temperatures  iii) Explain homogeneous catalysis, heterogeneous catalysis and Characteristics of catalysis reactions</p>
23	<b>3C03CHE-PS – Chemistry (for Physical Science)</b>	<p>7. Understand the basic principle underlying various spectroscopy</p> <p>8. Understand the basic concepts of thermodynamics and laws of thermodynamics</p>

		<p>9. Explain the formation , nomenclatureand applications of coordination complexes, Illustrate the valance bond theory of coordination complexes and explain the factors affecting the stability of complexes</p> <p>10. Understand the basic concepts of chemical kinetics and Calculate the value of <math>E_a</math> from the values of <math>k</math> at two temperatures .Illustrate the types of Catalysis and understand the Characteristics of catalytic reactions</p> <p>11. Understand the basic concept of nuclear chemistry, and explain the detection of isotopes using Aston’s mass spectrograph and separation of isotopes by diffusion methods</p> <p>12. Explain the principle and applications of different types of Chromatography</p>
24	<b>4C04CHE-BS- Chemistry (for Biological Science)</b>	<p>7. Illustrate the preparatory methods of glucose and fructose and explain their configurations Familiarize the structure and properties of sucrose and poly sachrides</p> <p>8. Know the structure of important five membered and six membered heterocyclic compounds and explain their reactivity and important reactions .Explain the preparation and properties of Quinoline and iso quinoline</p> <p>9. Understand the structure and functions of neuclic acids , Classify amino acidsand explain the structure of protein and its importance</p> <p>10. Understand the mechanism of enzyme action , enzyme catalysis</p> <p>11. Know the structure of Vitamin A, B and C. and hormones progesterone, Testosterone, cortisone, adrenaline and Thyroxin</p> <p>12. Understand the importance of metal ions in biological systems and Mechanism of <math>O_2</math> and <math>CO_2</math> transportation – Nitrogen Fixation Na-K pump</p>
25	<b>4C04CHE-PS- Chemistry (for Physical</b>	<p>7. Understand the basic concept in gaseous state Explain the deviation of real gases from ideal behaviorand Maxwell</p>



	Science)	<p>distribution of velocities and its use in calculating molecular velocities. Distinguish average velocity, RMS velocity and most probable velocity</p> <p>8. Understand the basic concepts of internal structure of Crystals (crystallography) and explain X-ray analysis of crystals</p> <p>9. Understand the basic concepts in liquid state and solutions. Illustrate Henry's law and explain its applications. Identify colligative properties and apply colligative properties to determine molecular mass</p> <p>10. Distinguish Specific conductance – molar conductance and equivalent conductance and explain laws of electrolysis, conductometric titrations and its applications</p> <p>11. Explain electrochemical cell, electrode potential, types of electrodes, EMF Nernst equation and potentiometric titration</p> <p>12. Acquaint with various instrumental methods in chemistry and Understand basic concepts of nanochemistry</p>
26	4C05CHE- Complementary Elective Course Practical	<p>7. Apply the theoretical concepts while performing experiments.</p> <p>8. Acquire practical skill to estimate acid, base, oxidizing agents etc by volumetric titration method</p> <p>9. Acknowledge experimental errors and their possible sources.</p> <p>10. Design, carry out, record and analyze the results of chemical experiments</p> <p>11. Acquire practical skill to analyse the anions and cations qualitatively present in a mixture of inorganic salts</p> <p>12. Learn the effective usage of chemicals</p>

### **2014-2018 Admission (MSc Chemistry)**

Sl. No.	Name of Course (paper)
1	CHE1C01 – Theoretical Chemistry 1

<b>2</b>	CHE1C02 – Inorganic Chemistry 1
<b>3</b>	CHE1C03 – Organic Chemistry 1
<b>4</b>	CHE1C04 – Physical Chemistry 1
<b>5</b>	CHE1&2P01 & – Inorganic Chemistry Practical 1
<b>6</b>	CHE1&2 P02 – Organic Chemistry Practical 1
<b>7</b>	CHE1&2 P03 – Physical Chemistry Practical 1
<b>8</b>	CHE2E02- Elective paper 1
<b>9</b>	CHE2C05 – Theoretical chemistry 2
<b>10</b>	CHE2C06 – Organic Chemistry 2
<b>11</b>	CHE2C07 – Physical Chemistry 2
<b>12</b>	CHE3C08- Inorganic Chemistry 2
<b>13</b>	CHE3C09- Organic Chemistry 3
<b>14</b>	CHE3C10- Physical Chemistry 3
<b>15</b>	CHE3E03- Elective paper 2
<b>16</b>	CHE3& 4 P04 – Inorganic Chemistry Practical 2
<b>17</b>	CHE3& 4 P05 – Organic Chemistry Practical 2
<b>18</b>	CHE3& 4 P06 – Physical Chemistry Practical 2
<b>19</b>	CHE4C11- Inorganic Chemistry 4
<b>20</b>	CHE4C12 – Interdisciplinary topics & Instrumentation techniques
<b>21</b>	CHE4E05 – Elective Paper 3
<b>21</b>	CHE4Pr- Project
<b>23</b>	CHE4C13 – Viva Voce

## **Programme Outcome, Programme Specific Outcome and Course Outcome**

**Name of the Department: PHYSICS**

### **2014-2018 Admission (BSc Physics)**

#### **Programme Outcomes**

##### **Critical Thinking:**

Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

Develop self-critical abilities and the ability to view positions, problems and social issues from plural perspectives.

##### **Effective Citizenship:**

Develop and practice gender-sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

##### **Effective Communication:**

Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language.

Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

## Programme Specific Outcomes

The design of the theory syllabus is to lay the foundations of physics by learning the history, concepts involved, its language (mathematics), problem-solving, and theoretical/experimental developments in various branches of Physics.

Understand and apply the principles of Electronics, Classical mechanics, Quantum mechanics, Thermodynamics, Nuclear physics and Electrodynamics.

Understand and apply the principles of Solid state physics, Optics, Photonics and Spectroscopy.

Understand the principles of Electronics, Design and test electronic circuits.

It also aims at the needs that an employer expects from a physics graduate/ to prepare them for scientific research.

## Course Outcome

Sl. No.	Name of Course (paper)	Outcomes	
1	1B01PHY: Physics Primers	1	What does physics deal with?
		2	Explain the Semiconductor revolution in physics
		3	What is Nanotechnology?
		4	Understand vector operations and vector algebra
		5	Determine derivative and integral of various functions
		6	State fundamental theorems of calculus
		7	Compare differential operators in various coordinate systems
2	2B02PHY: Electronics I	1	Understand the structure, operations and characteristics of BJT and FET
		2	Understand the biasing methods and design of BJT and FET circuits
		3	Understand the different number systems, conversions and binary arithmetic operations
		4	Understand the basic combinational logic gates
3	3B03PHY: Allied physics	1	Understand different Network theorems
		2	Understand the basic concepts of Transient currents

		3	Understand the basic concepts of material science
		4	Understand the properties of materials
		5	Identify different engineering materials & their properties
		6	Understand the properties & characteristics of semiconducting, insulating & magnetic materials
4	4B04PHY: Optics	1	Distinguish between Fresnel and Fraunhofer diffraction
		2	Analyse mathematically diffraction pattern due to slits and apertures
		3	Understand the concept of polarization and double refraction
		4	Understand the basic principle and working of lasers
		5	Understand the concept of interference and diffraction
		6	Distinguish between Fresnel and Fraunhofer diffraction
		7	Analyse mathematically diffraction pattern due to slits and apertures
5	4B05PHY: Practical – I	1	Understand multiple experimental techniques for determining physical quantities.
		2	Develop skill in systematic way of measurements by minimizing possible errors.
		3	Develop skill to analyze by plotting graphs using software.
		4	Develop skill for systematic trouble shooting.
		5	Perform error analysis for experiments.
6	5B06PHY: Electrodynamics-I	1	Understand the concept of Electric field, electric potential, magnetic field and magnetic potentials
		2	Use the principle of superposition and law of Gauss to calculate electric field Intensity
		3	Determine Electric potential of charge distributions and hence specify electric field intensity
		4	Understand the basic properties of conductors and capacitors
		5	Calculate the magnetic fields due to currents using Biot-Savart and Ampere laws.
		6	Compare Magnetostatics and Electrostatics.
7	5B07PHY: Thermal Physics	1	Understand the concept of temperature, the thermodynamic state and equilibrium.

		2	Explain the first law of thermodynamics through work and heat and its Mathematical Formulation.
		3	Understand the ideal gas equation and kinetic theory of gases
		4	Understand the second law of thermodynamics and thermodynamic temperature scale.
8	5B08PHY: Classical mechanics & Relativity	1	Background of Michelson-Morley Experiment
		2	Examples of conservation of angular momentum
		3	Lagrangian formulation
9	Core IX: 5B09PHY Python programming	1	Develop skills in creating program sketches of scientific problems
		2	Develop basic skills in logical thinking and programming
		3	To make real-life scientific problems easier on a computer with user interaction and graphics
10	5B10PHY: Atomic, Nuclear & Particle physics	1	Understand the structure nucleus and nuclear constituents
		2	Define nuclear forces and nuclear reactions
		3	Familiarize elementary particles and their properties
11	6B11PHY: Electrodynamics-II	1	Understand the basic concepts of Electrodynamics
		2	Explain the mathematical theory of Electromagnetic waves
		3	Applications of Static Fields & Time Varying Electromagnetic Fields
12	6B12PHY: Photonics & Spectroscopy	1	Understand the basic principle and working of lasers
		2	Explain different types of lasers
13	6B13PHY: Quantum mechanics	1	Explain Blackbody radiation problem, Photoelectric effect and Compton Effect using quantum theory of radiation
		2	Understand Rutherford, Bohr atom models and concept of energy and angular momentum quantisation
		3	Understand de-Broglie hypothesis, concept of wave nature of matter and Heisenberg uncertainty principle
		4	Determine probability of finding a particle and expectation values of variable using its wave function
		5	State and explain Pauli's exclusion principle

14	6B14PHY: Electronics- II	1	Understand the feedback circuits, oscillators and power amplifiers
			Understand OPAMP basics and different OPAMP circuits
			Understand the standard forms Boolean Expressions, Functions of Combinational Logic and K map simplifications.
15	6B15PHY(Elective):A. Plasma physics	1	Concept of temperature, Debye shielding
		2	Understand the production of plasma through collisions
		3	Determination of particle in a non-magnetic electric field and uniform magnetic field
		4	Waves in a Fluid plasma
16	6B15PHY(Elective): B. Astronomy & Astrophysics	1	Understand stellar classifications
		2	Understand basic concepts of birth of the star
		3	Identify different stars in HR diagram
		4	Understand the theory of death of the star
17	6B15PHY(Elective): C. Atmospheric Physics	1	Understand the Planetary atmosphere
		2	Concept of Green house effect, Black body radiation
		3	What is Raleigh and Mie scattering
16	6B15PHY(Elective):D. Nanoscience	1	Understand the basic concepts of Nanoscience
		2	Understand the properties of materials in the nano range
		3	Identify different techniques for the roduction of nanomaterials
		4	Understand characterization techniques & applications of nanomaterial
17	6B15PHY(Elective):E. Material science	1	Understand the basic concepts of material science
		2	Understand the properties of materials
		3	Identify different engineering materials & their properties
		4	Understand the properties & characteristics of semiconducting, insulating & magnetic materials
18	6B15PHY(Elective):F. Computational physics	1	Introduction to C programming
		2	Introduction to Fortan-77 language
		3	Numerical approach to physical problems
19	6B16PHY: Practical –II	1	Familiarise with apparatus for mechanical, electrical, magnetic and optical experiments.
		2	Develop skill in setting up an apparatus for accurate measurement of physical quantities.

		3	Understand multiple experimental techniques for determining physical quantities.
		4	Develop skill in a systematic way of measurements by minimising possible errors.
20	6B17PHY: Practical-III	1	Familiarise with active and passive electronic components.
		2	Familiarise multimeter, power supply, signal generator and cathode-ray oscilloscope.
		3	Develop skill in soldering and use of the breadboard.
		4	Develop skill in the construction of rectifiers, voltage regulators, amplifiers and oscillators.
21	6B18PHY: Project	1	To develop investigation aptitude in Physics/Life. Selection of the topic for the project must be based on the physics (theory/experimental) they have learned through Semesters I to IV.
22	1C01PHY: Mechanics	1	Understand Newton's laws of motion, the concepts of linear and angular momentum and torque
		2	Determine the Centre mass of a given configuration
		3	Understand the principle of work, energy and power
		4	Determine angular momentum of a body about any given axis
23	2C02PHY: Electricity, Magnetism and Thermal Physics	1	Understand the basic concepts of Magnetism & electricity
		2	Explain the magnetic effects of electric currents
		3	Understand the basic principles of Thermodynamics
24	3C03PHY: Optics and Photonics	1	Understand the concept of interference and diffraction
		2	Distinguish between Fresnel and Fraunhofer diffraction
		3	Analyse mathematically diffraction pattern due to slits and apertures
		4	Understand the concept of polarization and double refraction
		5	Understand the basic principle and working of lasers
		6	Explain different types of lasers
25	4C04PHY: Modern Physics and Electronics	1	Understand basic crystal structure and compare various crystal systems State and prove Bragg's law



			Define nuclear forces and nuclear reactions
		2	Understand the basic concepts of Transient currents
		3	Understand different Network theorems
		4	Understand the theory of the death of the star
		5	Identify different stars in HR diagram
		6	Understand basic concepts of the birth of the star
		7	Understand stellar classifications
		8	Familiarize elementary particles and their properties
26	4C05PHY: Practical	1	Familiarise with apparatus for experiments in mechanics, optics, electricity and magnetism and electronics and electronics experiments.
		2	Develop skill in setting up apparatus for accurate measurement of physical quantities.
		3	Understand multiple experimental techniques for determining physical quantities.
		4	Develop skill in a systematic way of measurements by minimizing possible errors.
27	5D01PHY: A. Environmental Physics	1	Understand the basic concepts of climate change science
		2	Understand some of the potentially serious consequences of climate change
		3	Analyse linkages between climate change adaptation and development planning.
		4	Describe relevant policy approaches and strategic frameworks for climate change mitigation
		5	Understand Friction and Air Resistance
		6	Familiarise with the Carnot's Cycle
28	5D01PHY: B. Joy of star watching	1	Understand Our Universe and its origin
		2	Understand simple constellations
		3	Explain the stars in Kerala culture
29	5D01PHY: C. Disaster Management	1	Understand the challenges for food security
		2	Temporal Transport Hazard Dynamics
		3	Future Applications and challenges of Remote sensing
30	5D01PHY: D. Biophysics	1	Types of muscles
		2	Familiarise of Radiation bio-physics:
		3	What is Biomedical instrumentation

## **2019 Admission Onwards (BSc Physics)**

### **Programme Outcomes**

#### **PO 1.Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and the ability to view positions, problems and social issues from plural perspectives.

#### **PO 2.Effective Citizenship:**

- 2.1. Learn to participate in nation-building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender-sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

#### **PO 3.Effective Communication:**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language.
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.

3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

**PO 4. Interdisciplinarity:**

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem-solving and evolving a comprehensive perspective.

**Programme Specific Outcomes**

**PSO1:** Understand and apply the principles of Classical mechanics, Quantum mechanics, Thermodynamics, Nuclear physics and Electrodynamics.

**PSO 2:** Understand and apply the principles of Solid state physics, Optics, Photonics and Spectroscopy.

**PSO 3:** Understand the principles of Electronics, Design and test electronic circuits.

**PSO 4:** Understand and apply the principles of Mathematical Physics and Computational Physics and do Error analysis in measurements.

## Course Outcome

Sl. No.	Name of Course (paper)	Outcomes	
1	CORE COURSE I: MECHANICS I	i	Understand Newton's laws of motion, the concepts of linear and angular momentum and torque
		ii	Determine the Centre mass of a given configuration
		iii	Understand the principle of work, energy and power
		iv	Determine angular momentum of a body about any given axis
2	CORE COURSE II: MATHEMATICAL PHYSICS AND ERROR ANALYSIS	i	Understand vector operations and vector algebra
		ii	Determine derivative and integral of various functions
		iii	State fundamental theorems of calculus
		IV	Compare differential operators in various coordinate systems
		v	Understand the basic concepts of modelling
		Vi	Solve first order and second-order ODEs
		vii	Estimate uncertainties in measured values
3	CORE COURSE III: MECHANICS II	i	Understand the concept of Galilean transformations and uniformly accelerating systems
		ii	Determine the trajectory of a body in central force problem using Newton's laws
		iii	Understand Kepler's laws of planetary motion
		IV	Formulate the mathematical equation of waves
		v	Understand the concept and consequences of special theory of relativity
4	CORE COURSE IV: ELECTRONICS I	i	Understand the basics of PN junction diode, Zener diode and their applications
		ii	Understand the structure, operations and characteristics of BJT and FET
		iii	Understand the biasing methods and design of BJT and FET circuits
		IV	Understand the different number systems, conversions and binary arithmetic operations
		v	Understand the basic combinational logic gates

5	CORE COURSE V: - GENERAL PHYSICS PRACTICAL I	i	Familiarize with apparatus for mechanical, electrical, magnetic and optical experiments.
		ii	Develop skill in setting up an apparatus for accurate measurement of physical quantities.
		iii	Understand multiple experimental techniques for determining physical quantities.
		Iv	Develop skill in a systematic way of measurements by minimizing possible errors.
		v	Develop the skill to analyze by plotting graphs using the software.
		Vi	Develop skill for systematic troubleshooting.
		vii	Perform error analysis for experiments.
6	CORE COURSE VI: QUANTUM MECHANICS	i	Understand the limitations of classical mechanics
		ii	Explain Blackbody radiation problem, Photoelectric effect and Compton Effect using quantum theory of radiation
		iii	Understand Rutherford, Bohr atom models and concept of energy and angular momentum quantisation
		Iv	Understand de-Broglie hypothesis, the concept of wave nature of matter and Heisenberg uncertainty principle
		v	Determine the probability of finding a particle and expectation values of variable using its wave function
		Vi	State and explain Pauli's exclusion principle
7	CORE COURSE VII: ELECTROSTATICS AND MAGNETOSTATICS	i	Understand the concept of Electric field, electric potential, magnetic field and magnetic potentials
		ii	Use the principle of superposition and law of Gauss to calculate electric field Intensity
		iii	Determine Electric potential of charge distributions and hence specify electric field intensity
		Iv	Understand the basic properties of conductors and capacitors
		v	Calculate the magnetic fields due to currents using Biot-Savart and Ampere laws.

		Vi	Compare Magnetostatics and Electrostatics.
8	CORE COURSE VIII: THERMODYNAMICS AND STATISTICAL MECHANICS	i	Understand the concept of temperature, the thermodynamic state and equilibrium.
		ii	Explain the first law of thermodynamics through work and heat and its Mathematical Formulation.
		iii	Understand the ideal gas equation and the kinetic theory of gases
		Iv	Understand the second law of thermodynamics and thermodynamic temperature scale.
		v	Define entropy and thermodynamic potentials
9	CORE COURSE IX: ELECTRONICS II	i	Understand the AC analysis of BJT circuits and CE amplifiers
		ii	Understand the feedback circuits, oscillators and power amplifiers
		iii	Understand OP AMP basics and different OP AMP circuits
		Iv	Understand the standard forms Boolean Expressions, Functions of Combinational Logic and K map simplifications.
10	CORE COURSE X: SOLID STATE PHYSICS & SPECTROSCOPY	i	Understand basic crystal structure and compare various crystal systems
		ii	State and prove Bragg's law
		iii	Explain X-ray diffraction and various methods to obtain a diffraction pattern
		Iv	Understand basic properties of semiconductors and band structure of solids
		v	Discuss Hall Effect and list its applications
		Vi	Describe various regions of EM spectrum
11	CORE COURSE XI : OPTICS &PHOTONICS	i	Understand the concept of interference and diffraction
		ii	Distinguish between Fresnel and Fraunhofer diffraction
		iii	Analyse mathematically diffraction pattern due to slits and apertures
		Iv	Understand the concept of polarization and double refraction
		v	Understand the basic principle and working of lasers
		Vi	Explain different types of lasers

12	CORE COURSE XII	i	Understand the structure nucleus and nuclear constituents
		ii	Define nuclear forces and nuclear reactions
		iii	Familiarize elementary particles and their properties
		Iv	Understand stellar classifications
		v	Understand basic concepts of the birth of the star
		Vi	Identify different stars in HR diagram
		vii	Understand the theory of the death of the star
13	CORE COURSE XIII : ELECTRODYNAMICS AND CIRCUIT THEORY	i	Understand the basic concepts of Electrodynamics
		ii	Explain the mathematical theory of Electromagnetic waves
		iii	Understand different Network theorems
		Iv	Understand the basic concepts of Transient currents
14	6B14PHY(1).PYTHON PROGRAMMING	i	Develop skills in creating program sketches of scientific problems
		ii	Develop basic skills in logical thinking and programming
		iii	To make real-life scientific problems easier on a computer with user interaction and graphics
15	6B14PHY(2) NANOSCIENCE	i	Understand the basic concepts of Nanoscience
		ii	Understand the properties of materials in the nano range
		iii	Identify different techniques for the production of nanomaterials
		Iv	Understand characterization techniques & applications of nanomaterial
16	6B14PHY(3) MATERIAL SCIENCE	i	Understand the basic concepts of material science
		ii	Understand the properties of materials
		iii	Identify different engineering materials & their properties
		Iv	Understand the properties & characteristics of semiconducting, insulating & magnetic materials
17	6B14PHY (4): COSMOLOGY	i	Understand the history of cosmology at a different era

		ii	Explain the general theory of relativity and curvature of space
		iii	Understand cosmological principle and Friedmann model
		Iv	Explain the expansion of the universe based on Hubble's law and state big bang theory
18	6B14 PHY(5) PLASMA PHYSICS	i	Define plasma and plasma parameters
		ii	Understand applications of plasma
		iii	Determine the nature of plasma as a fluid
19	CORE COURSE XV: Practical II General Physics II	i	Familiarise with apparatus for mechanical, electrical, magnetic and optical experiments.
		ii	Develop skill in setting up apparatus for accurate measurement of physical quantities.
		iii	Understand multiple experimental techniques for determining physical quantities.
		Iv	Develop skill in a systematic way of measurements by minimising possible errors.
20	CORE COURSE XVI: PRACTICAL III ELECTRONICS	i	Familiarise with active and passive electronic components.
		ii	Familiarise multimeter, power supply, signal generator and cathode-ray oscilloscope.
		iii	Develop skill in soldering and use of the breadboard.
		Iv	Develop skill in the construction of rectifiers, voltage regulators, amplifiers and oscillators.
21	6B17 PHY PROJECT	i	To develop investigation aptitude in Physics/Life. Selection of the topic for the project must be based on the physics (theory/experimental) they have learned through Semesters I to IV.
22	COMPLEMENTARY ELECTIVE COURSE I: -MECHANICS	i	Understand the basic concepts of Properties of matter
		ii	Explain the dynamics of rigid bodies.
		iii	Understand the basic concepts of wave motion and oscillations
23	COMPLEMENTARY ELECTIVE COURSE II: ELECTRICITY, MAGNETISM	i	Understand the basic concepts of Magnetism & electricity
		ii	Explain the magnetic effects of electric currents



	AND THERMODYNAMICS	iii	Understand the basic principles of Thermodynamics
24	COMPLEMENTARY ELECTIVE COURSE III: OPTICS AND PHOTONICS	i	Understand the basic concepts of Interference
		ii	Understand the basic concepts of Diffraction
		iii	Understand the basic concepts of Polarization
		Iv	Understand the basic concepts of Photonics and Fibre Optics
25	COMPLEMENTARY ELECTIVE COURSE IV: ELECTRONICS AND MODERN PHYSICS	i	Understand the basic concepts of Basic electronics
		ii	Understand the basic concepts of Digital electronics
		iii	Understand the basic concepts of Nuclear Physics
		Iv	Understand the basic concepts of Particle physics and Astrophysics
26	COMPLEMENTARY COURSE V – PHYSICS PRACTICAL	i	Familiarise with apparatus for experiments in mechanics, optics, electricity and magnetism and electronics and electronics experiments.
		ii	Develop skill in setting up apparatus for accurate measurement of physical quantities.
		iii	Understand multiple experimental techniques for determining physical quantities.
		Iv	Develop skill in a systematic way of measurements by minimizing possible errors.
27	5D01PHY: INTRODUCTION TO CLIMATE AND CLIMATE CHANGE SCIENCE	i	Understand the basic concepts of climate change science
		ii	Understand some of the potentially serious consequences of climate change
		iii	Analyse linkages between climate change adaptation and development planning.
		Iv	Describe relevant policy approaches and strategic frameworks for climate change mitigation
28	5D02PHY RENEWABLE ENERGY SOURCES	i	Understand the sources of renewable energy
		ii	Understand the solar energy measurements & their applications
		iii	Understand the wind energy production & applications

		Iv	Identify the energy from biomass, geothermal & ocean
29	5D 03 PHY: BIOPHYSICS	i	Understand the application of Physics in Biology and Medical fields
		ii	Understand about bioelectricity
		iii	Understand the principles behind EEG and ECG
30	5D 04 PHY: JOY OF STAR WATCHING	i	Understand Our Universe and its origin
		ii	Understand simple constellations
		iii	Explain the stars in Kerala culture
31	5D05PHY: ELECTRICITY IN DAILY LIFE	i	Understand the sources of Electricity
		ii	Explain the production of Electricity
		iii	Understand the basic concepts of electricity auditing
32	5D06PHY : INTRODUCTION TO BASIC ELECTRONICS	i	Understand the concepts of Basic electronics.
		ii	Explain the Semiconductor diode
		iii	Understand the basic electronic measurements and the instruments.

## **2014-2018 Admission (MSc Physics)**

### **Programme Outcomes**

Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

To define a research problem, translate ideas into working models, interpret the data collected, draw the conclusions and report scientific data in the form of a dissertation.

Identify, classify and extrapolate the physical concepts and related mathematical methods to formulate and solve real physical problems.

To disseminate scientific knowledge and scientific temper in the society to contribute towards the greater human cause.

Explore new knowledge independently for the development of the nation and the world and are able to engage in a lifelong learning process.

### **Programme Specific Outcomes**

**PSO1:** Understand and apply the principles of Classical mechanics, Quantum mechanics, Electronics, Thermodynamics, Mathematical Physics, Computational Physics and Electrodynamics.

**PSO 2:** Develop the skills of critical analysis and problem-solving required in the application of principles of Physics.

**PSO 3:** Demonstrate a strong capability of organizing and presenting acquired knowledge both on oral and written platforms.

## **2019 Admission Onwards (MSc Physics)**

### **Programme Outcomes**

Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

To define a research problem, translate ideas into working models, interpret the data collected, draw the conclusions and report scientific data in the form of a dissertation.

Identify, classify and extrapolate the physical concepts and related mathematical methods to formulate and solve real physical problems.

To disseminate scientific knowledge and scientific temper in the society to contribute towards the greater human cause.

Explore new knowledge independently for the development of the nation and the world and are able to engage in a lifelong learning process.

### **Programme Specific Outcomes**

**PSO1:** Understand and apply the principles of Classical mechanics, Quantum mechanics, Electronics, Thermodynamics, Mathematical Physics, Computational Physics and Electrodynamics

**PSO 2:** Develop the skills of critical analysis and problem-solving required in the application of principles of Physics

**PSO 3:** Demonstrate a strong capability of organizing and presenting acquired knowledge both on oral and written platforms

## Course Outcome

Sl. No.	Name of Course (paper)	Outcomes	
1	PHY1C01 MATHEMATICAL PHYSICS -I	i	Understand Orthogonal matrices-Hermitian Matrices-Unitary matrices-Diagonalisation of matrices
		ii	definition properties-the Beta function
		iii	Understand Orthogonal coordinates, Curvilinear coordinates
		iv	Application of Hermite function- Laguerre functions
2	PHY1C02 CLASSICAL MECHANICS	i	Understand Scattering in a central force field
		ii	Deduction of Hamilton's principle
		iii	Elementary ideas of calculus of variation
		iv	Formulation of the problem-Lagrange's equations of motion for small
		v	Understand the basic concepts of modelling
		vi	Solve Rate of change of a vector
		vii	Estimate Free vibrations of a linear triatomic molecule.
3	PHY1C03 ELECTRODYNAMICS	i	Understand the concept of Electric field, electric potential, magnetic field and magnetic potentials
		ii	Use the principle of superposition and law of Gauss to calculate electric field Intensity
		iii	Determine Electric potential of charge distributions and hence specify electric field intensity
		IV	Formulate Maxwell's equations and their empirical basis
		v	What is radiation
4	PHY1C04 ELECTRONICS	i	Understand the basics of operational Amplifier- -- Differential amplifier circuit using transistors--
		ii	Understand the structure, operations and characteristics of The ideal Operational amplifier—Open loop and closed loop Op-amp configurations
		iii	Understand the Basic Op-amp circuits—Summing, scaling and averaging amplifier

		Iv	Understand the DE Multiplexers—Applications of Multiplexers
		v	Understand the Microprocessors: Intel 8085—functional block diagram
5	PHY1P01/PHY2P01 – (Practical-I)-BASIC PHYSICS LABORATORY-I	i	Familiarize with apparatus for mechanical, electrical, magnetic and optical experiments.
		ii	Develop skill in setting up an apparatus for accurate measurement of physical quantities.
		iii	Understand multiple experimental techniques for determining physical quantities.
		Iv	Develop skill in systematic way of measurements by minimizing possible errors.a
		v	Develop skill to analyze by plotting graphs using software.
		vi	Develop the skill for systematic troubleshooting.
		vii	Perform error analysis for experiments.
6	PHY2C06 QUANTUM MECHANICS-I	i	troubleshooting
		ii	Explain Schrodinger, Heisenberg and Interaction pictures
		iii	Understand Rutherford, Bohr atom models and concept of energy and angular momentum quantisation
		Iv	Understand Orbital angular momentum – General formalism of angular momentum – Matrix representation of angular momentum
		v	Determine Time independent perturbation theory - non-degenerate and degenerate cases - stark and effect in a Hydrogen atom
		vi	state and explain space-time symmetries, Space translation and conservation of linear momentum
7	PHY2C07 MATHEMATICAL PHYSICS- II	i	Understand the concept of Infinite series-Series of function-Binomial theorem
		ii	One dimensional problem - Problems in two and three dimensions.
		iii	Determine Fourier transform
		Iv	Understand the Abelian and Non-Abelian group
		v	Calculate the Schur's lemmas
		vi	Properties of Laplace

			transform-Laplace convolution theorem-
8	PHY2C 08 STATISTICAL MECHANICS	i	Understand the concept of Postulates of equilibrium thermodynamics
		ii	Explain the Statistical Basis of Thermodynamics and Microcanonical Ensemble
		iii	Understand Liouville's theorem and its significance
		Iv	Understand Canonical ensemble-Equilibrium between system and reservoir
		v	Define simple uniaxial ferromagnets
9	PHY2C 09 SPECTROSCOPY	i	Understand the Hydrogen atom and the three quantum numbers-spectra
		ii	Understand the normal Zeeman effect
		iii	Understand Regions of the spectrum-classification of molecules
		Iv	Understand The vibrating diatomic molecule
10	PHY3C10 QUANTUM MECHANICS –II	i	Understand Time-dependent perturbation theory
		ii	State Scattering cross-section, scattering amplitude of spinless particles
		iii	Explain identical particles, Construction of symmetric and antisymmetric wave functions-
		Iv	Understand the Klein-Gordon equation
		v	Discuss Equation of continuity
		Vi	Describe Delayed choice experiment, Einstein-Bohr controversy
11	PHY3C11 SOLID STATE PHYSICS	i	Understand the Bragg law - Scattered wave amplitude - Brillouin Zones
		ii	Vibrations of crystals with monatomic and diatomic basis
		iii	Analyse Energy levels in 1D
		Iv	Understand the Intrinsic carrier concentration
		v	Understand Superconductivity
		Vi	Explain ferromagnetic domains
12	PHY3C12 NUCLEAR AND PARTICLE PHYSICS	i	Nuclear size, shape, mass and binding energy, semi-empirical mass formula
		ii	Define The shell model, shell model potential
		iii	Familiarize Beta decay, Energy release in beta decay
		Iv	Understand Types of reactions and conservation laws

		v	Understand Basic forces and classification of particles:
		Vi	the TCP theorem, conservation of parity
		vii	quantum chromodynamics and gluons Enough exercises
13	PHY4C14 OPTICS	i	Understand the basic concepts of Spatial and temporal coherence
		ii	Explain coherent states and their properties
		iii	Understand different Lasers
		Iv	Understand the basic concepts of Nonlinear polarization of the medium
14	PHY4C15 NUMERICAL TECHNIQUES & PROBABILITY	i	Probability definition
		ii	Understand the Binomial distribution
		iii	Understand the Bisection method, ordinary iteration method,
15	PHY3P03/PHY4P03- (Practical –III) - ADVANCED PHYSICS AND ELECTRONICS	i	Develop skill in setting up apparatus for accurate measurement of physical quantities.
		ii	Understand multiple experimental techniques for determining physical quantities.
		iii	Develop skill in a systematic way of measurements by minimising possible errors.
		Iv	Develop skill in the construction of rectifiers, voltage regulators, amplifiers and oscillators.
16	PHY3E01- PLASMA PHYSICS	i	Understand the Existence of plasma
		ii	Understand the Debye shielding 1D and 3D
		iii	The set of fluid equations
		Iv	Understand The problem of controlled fusion-magnetic confinements such as toruses – mirrors
17	PHY3E02-RADIATION PHYSICS	i	Types of radiations, ionizing, non-ionizing, electromagnetic
		ii	Explain bremsstrahlung, range energy relation
		iii	Understand Particle flux and fluence
		Iv	Explain Basic concepts of cell biology, Effects of ionizing radiations at molecular, submolecular and cellular levels,
18	PHY3E03 -MICROPROCESSOR AND APPLICATIONS	i	Define Assembly language programming—subroutine—delay routine— Assembly language programming in 8085 .



		ii	Understand Memory mapping and I/O mapping
		iii	Need for interrupts—types of interrupts—software interrupts of 8085
19	PHY3E04- CHAOS & NONLINEAR PHYSICS	i	Familiarise Linearity and non-linearity
		ii	Understand the Qualitative features of non-linear systems
		iii	Explain the Chaos in nonlinear electronic circuits
		Iv	Understand the basic concepts of Lyapunov exponents
20	PHY3E05- ATMOSPHERIC PHYSICS	i	Familiarise aSub earth and the atmosphere.
		ii	Familiarise latitudinal and seasonal variations.
		iii	Understand the Stability criteria – parcel method
		Iv	Explain Atmospheric pollution
21	PHY 4E06-OPTOELECTRONICS	i	Understand the p-n junction principles - open circuit-
		ii	Explain the double heterostructure
		iii	Understand the generation of high power pulses, Q-factor
		iv	Wave propagation in an anisotropic crystal - polarization response of to light
22	PHY4E07-ASTROPHYSICS	i	Understand the basic concepts of Absolute magnitude and distance modulus,
		ii	Explain the Structure and evolution of stars
		iii	Understand the basic concepts of The space-time dynamics of the Universe
23	PHY4E08- ELECTRONIC INSTRUMENTATION	i	Understand the Basic characteristics of measuring devices instruments
		ii	Explain principles of transducers
		iii	Understand the basic principles of Cathode ray oscilloscopes
24	PHY4E09- COMMUNICATION ELECTRONICS	i	Antenna parameters – Effects of ground on antenna
		ii	Understand the basic concepts of Amplitude modulation and demodulation circuits
		iii	Understand the basic concepts of Pulse amplitude modulation
		Iv	Understand the basic concepts of optical heterodyne

			receivers-analogue system design
25	PHY4E10- CONDENSED MATTER PHYSICS	i	Understand the basic concepts of Hartree Fock approximation; Plasmons and electron plasmon interactions
		ii	Understand the basic Physics of alloy formation
		iii	Understand the basic concepts of Diffusion in solids, Vacancies, dislocations and mechanical strengths
		IV	Understand the basic concepts of Nanomaterials and Quantum mechanics
26	PHY4E11-NANOSCIENCE AND TECHNOLOGY	i	Familiarise Optical microscopies- Mass and Ion beam spectroscopy- X-ray diffraction
		ii	Develop skill in setting up apparatus for accurate measurement of physical quantities.
		iii	Understand Carbon nanostructures
		IV	Giant and colossal magnetoresistance
27	PHY4E12 -EXPERIMENTAL TECHNIQUES	i	Understand the basic concepts of Units and basic definitions, Roughing pumps - Oil sealed rotary vacuum pump and Sorption pump
		ii	Understand Thermoelectric power, Interference filters
		iii	Analyse Liquefaction of gases – Internal and external work methods
		IV	Describe Henning and Hydrogen vapour cryostat,

# **Programme Outcome, Programme Specific Outcome and Course Outcome**

Name of the Department: P G department of Economics

## **2014-2018 Admission**

### **Programme Outcomes: B A Economics**

#### **PO1. Critical Thinking**

- 1.1 Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2 Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### **PO2. Effective Citizenship**

- 2.1 Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2 Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3 Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

#### **PO3. Effective Communication**

- 3.1 Acquire the ability to speak, write, read and listen clearly in person and through

electronic media in both English and in one Modern Indian Language

3.2 Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well informed manner.

3.3 Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

#### PO4. Inter disciplinary

4.1 Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2 Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3 Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

### **Programme Specific Outcomes**

1. The programme with structured curricula will support the academic development of the undergraduates.

2. The programme will provide the students with the opportunity to pursue courses that emphasize quantitative, qualitative and theoretical aspects of economics.

3. The programme will provide a well-resourced teaching learning environment for the students of economics, which will definitely lead to the ultimate educational goal of “learning to be”.

4. The programme will promote academic writing, critical thinking and research aptitude among the students.

5. Needless to point out, the students will gain a source of livelihood by expanding their skill set and widening their knowledge horizon.

## Course Outcome

Sl. No.	Name of Course (paper)	Outcomes	
<b>1</b>	<b>CORE 1: MICROECONOMIC S – I (1B01- ECO)</b>	<b>i</b>	To deal with basic theories and concepts that the mainstream economic literature
		<b>ii</b>	To understand the cost and production analysis.
		<b>iii</b>	To know about different market equilibrium and respective market
		<b>iv</b>	To give basic knowledge about consumer choices
<b>2</b>	<b>CORE 2: MICROECONOMIC S – II (2B02- ECO)</b>	<b>i</b>	To give basic knowledge about different market structure
		<b>ii</b>	To understand economic decision making in different markets
		<b>iii</b>	To brief about factor market
		<b>iv</b>	To give an insight about social welfare and welfare economics
<b>3</b>	<b>CORE3: MACROECONOMICS – I (3B03- ECO)</b>	<b>i</b>	To understand systems facts and the latest theoretical developments in Macro Economics.
		<b>ii</b>	To Analysis of Classical Macroeconomic Model
		<b>iii</b>	To sum up Keynesian Macroeconomic Model
		<b>iv</b>	To evaluate Consumption and Investment Behaviour of Households and Firms

<b>4</b>	<b>CORE 4: INTERNATIONAL ECONOMICS (3B04- ECO)</b>	<b>i</b>	To deals with the economic and financial interdependence among nations.
		<b>ii</b>	Preparing the students to undertake higher studies and research in issues related to International Economics
		<b>iii</b>	To learn Foreign Exchange and international financial system
<b>5</b>	<b>CORE 5: MACROECONOMICS – II (4B05- ECO)</b>	<b>i</b>	To get familiarise with theories of money flow
		<b>ii</b>	To sum up ISLM and other relevant macroeconomics models
		<b>iii</b>	To introduce trade cycles and other macroeconomics aspects such as employment, inflation and so on
<b>6</b>	<b>CORE 6: ENVIRONMENTA L ECONOMICS (4B06- ECO)</b>	<b>i</b>	To maintain economic growth and development of Indian economy
		<b>ii</b>	To ensure environmental protection and pollution control measures.
		<b>iii</b>	To teach economic aspects of environment and related theories
		<b>iv</b>	To enhance knowledge about role of environment in economic planning
<b>7</b>	<b>CORE 7: BASIC TOOLS FOR ECONOMIC ANALYSIS – I</b>	<b>i</b>	Understanding in quantitative techniques with in economics

	<b>(5B07- ECO)</b>	<b>ii</b>	To introduce Elementary Mathematics
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		<b>iii</b>	To sum up Elementary set theory and description of data
		<b>iv</b>	To equip the students to quantify economic variables and to enable them to apply statistical techniques in Economics.
<b>8</b>	<b>CORE 8: ALTERNATIVE ECONOMICS (5B08- ECO)</b>	<b>i</b>	To introduce students of economics to a few alternative approaches to neo-classical economics.
		<b>ii</b>	To teach methodological departures and the possibilities to think differently.
		<b>iii</b>	To introduce new branches of economics
<b>9</b>	<b>CORE 9: RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS (5B09- ECO)</b>	<b>i</b>	Explain the main concerns of social science disciplines.
		<b>ii</b>	Articulate the basic terminology and theories prevalent across various disciplines.
		<b>iii</b>	Understand qualitative and quantitative models within the social sciences, especially economics.
		<b>iv</b>	Learn to apply the methods and theories of social sciences to contemporary issues.

		<b>v</b>	Critically read popular and periodical literature from a social science perspective.
<b>10</b>	<b>CORE 10: DEVELOPMENT ECONOMICS (5B10-</b>	<b>i</b>	To create general understanding among students about the theories of development and growth models so as to explain the development or

	<b>ECO)</b>		growth process of various countries or states.
		<b>ii</b>	To give an idea about how they are different by giving empirical details of various indicators of growth and development in India in comparison to other parts of the world.
		<b>iii</b>	To understand various developmental issues faced by an economy and place it within the developmental debate.
<b>11</b>	<b>CORE 11: ECONOMICS OF BANKING &amp;FINANCE (5B11- ECO)</b>	<b>i</b>	To understand evolution of banking.
		<b>ii</b>	To introduce the students to the various facts of banking sector.
		<b>iii</b>	To maintain awareness of banking sector.
		<b>iv</b>	To identify structure and functions of banking.
<b>12</b>	<b>CORE 12: BASIC TOOLS FOR ECONOMIC ANALYSIS – II (6B12- ECO)</b>	<b>i</b>	To This course is expected to provide students with an elementary introduction to statistical tools and mathematical concepts that are used in the study of Economics in UG level.



		<b>ii</b>	To introduce essential elementary topics in Statistics and mathematics.
		<b>iii</b>	To develop skills in applying in statistical techniques and mathematical concepts those are indispensable for the in-depth study of theoretical as well as empirical economics.
<b>13</b>	<b>CORE 13: CENTRAL THEMES IN INDIAN</b>	<b>i</b>	To help the students to identify the basic structure and working of Indian economy by enabling them

	<b>ECONOMY (6B13 - ECO)</b>		to use qualitative and quantitative data relating to various economic issues and policies.
		<b>ii</b>	Students may get an opportunity to identify the strategic drivers in the development of Indian Economy.
		<b>iii</b>	It will create an environment to comprehend and critically appraise the current problems and policies relating to Indian economy.
<b>14</b>	<b>CORE 14: PUBLIC ECONOMICS (6B14- ECO)</b>	<b>i</b>	To covers theories of public economics and discusses about Indian public finance.
		<b>ii</b>	To provide an understanding of the basic issues relating to public revenue, expenditure, debt management, budget preparation and centre state financial relations in India.

		<b>iii</b>	To understand the nature of government intervention and its implications for allocation, distribution and stabilization.
		<b>iv</b>	To look at how public sector behaviour is shaped and discusses about public choice.
<b>15</b>	<b>CORE 15: BASIC ECONOMETRIC ANALYSIS (6B15-ECO)</b>	<b>i</b>	To showcase the increased emphasis on the development and use of econometric techniques for the analysis of economic problems.
		<b>ii</b>	The study of Econometrics has become an essential part of every undergraduate course in Economics, and it is not an exaggeration to say that it is also an essential part of every

			economist's training.
		<b>iii</b>	To enhance the analytical skill of students thereby they will attract wider demand in professional fields.
		<b>iv</b>	Mastery over econometric tools helps the practitioner understand the problem at hand in its different dimensions.
<b>16</b>	<b>CORE 16: PROJECT/COURSE WORK (6BP - ECO)</b>	<b>i</b>	To motivate students to enquire into recent relevant economic issues and find solutions

		<b>ii</b>	To enable the student to approach socio economic issues in a theoretical perspective. The student is encouraged to collect and organize the existing information on the topic and arrive at his/her own logical conclusion by following a methodology and applying the analytical tool.
		<b>iii</b>	To provide opportunity to apply the theoretical knowledge that they acquired in class room environment to the real world situations by taking up any issue as a project that requires review, explanation or solution.
		<b>iv</b>	To generate new knowledge and updating existing knowledge from the day to day experience is one of the aims of higher education.
<b>17</b>	<b>OPEN COURSE: ECONOMICS OF TRAVEL AND TOURISM (5D0 - ECO)</b>	<b>i</b>	To part away general information about travel and tourism aspects of India
		<b>ii</b>	To provide basic economic principles which rules travel and tourism

## **2019-Admission Onwards**

### **Programme Outcomes: B A Economics**

#### PO1. Critical Thinking

- 1.1 Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2 Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### PO2. Effective Citizenship

- 2.1 Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2 Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3 Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

#### PO3. Effective Communication

- 3.1 Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2 Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3 Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

#### PO4. Inter disciplinarity

- 4.1 Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2 Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3 Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

### **Programme Specific Outcomes**

- 1. The programme with structured curricula will support the academic development of the undergraduates.
- 2. The programme will provide the students with the opportunity to pursue courses that emphasize quantitative, qualitative and theoretical aspects of economics.
- 3. The programme will provide a well-resourced teaching learning environment for the students of economics, which will definitely lead to the ultimate educational goal of “learning to be”.
- 4. The programme will promote academic writing, critical thinking and research aptitude among the students.
- 5. Needless to point out, the students will gain a source of livelihood by expanding their skill set and widening their knowledge horizon.

## Course Outcome

Sl. No.	Name of Course (paper)	Outcomes	
<b>1</b>	<b>CORE COURSE I : MICROECONOMIC S – I (1B01 ECO)</b>	<b>1</b>	A strong theoretical and empirical foundation in economics which produces employable graduates and has scope for a variety of opportunities for higher education in economics and related disciplines.
		<b>2</b>	Students' familiarity about the tool box of micro economics will enhance the capacity for understanding the functioning of economies.
		<b>3</b>	A thorough knowledge and theoretical understanding of the foundations of modern economic analysis
<b>2</b>	<b>CORE COURSE II: MICROECONOMIC S – II (2B02 ECO)</b>	<b>1</b>	Students may acquire confidence to apply the principles of micro economics to the decision making of firms and the functioning of the market.
		<b>2</b>	Students will also be able to analyze the distributional dynamics of the economy both at the micro and the macro level
<b>3</b>	<b>CORE COURSE III: CENTRAL THEMES IN INDIAN ECONOMY</b>	<b>1</b>	To help the students to identify the basic structure and working of Indian economy by enabling them to use qualitative and quantitative data relating to

	<b>(3B03 ECO)</b>		various economic issues and policies
		<b>2</b>	Students may get an opportunity to identify the strategic drivers in the development of Indian Economy.
		<b>3</b>	It will create an environment to comprehend and critically appraise the current problems and policies relating to Indian economy.
<b>4</b>	<b>CORE COURSE IV: INTERNATIONAL ECONOMICS (3B04 ECO)</b>	<b>1</b>	Enabling the students to assess current international economic issues based on theory and evidence.
		<b>2</b>	Preparing the students to undertake higher studies and research in issues related to International Economics
		<b>3</b>	Students may get an opportunity to examine the trends in global economic performance
<b>5</b>	<b>CORE COURSE V: RESEARCH METHODS AND TECHNIQUES FOR ECONOMIC ANALYSIS (4B05 ECO)</b>	<b>1</b>	To initiate students to the field of academic research.
		<b>2</b>	Introduce quantitative, qualitative and analytical tools required to prepare small research projects.

		<b>3</b>	To bridge the gap between theory and empirics and to familiarize the use and importance of data in research
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		<b>4</b>	To highlight the importance of scientific research in economics based on academic honesty, integrity and ethics
<b>6</b>	<b>CORE COURSE VI: ENVIRONMENTAL ECONOMICS (4B06 ECO)</b>	<b>1</b>	To provide a deeper understanding about the interface between ecology and economy.
		<b>2</b>	Understand the economic incentives to improve and conserve the environment.
		<b>3</b>	To provide basic conceptual understanding of environmental disaster, its management and mitigation
		<b>4</b>	Ultimately, greater awareness will be imparted about the issues of environmentally sustainable development in an interdisciplinary perspective.
<b>7</b>	<b>CORE COURSE VII: BASIC TOOLS FOR ECONOMIC ANALYSIS I (5B07 ECO)</b>	<b>1</b>	To enable the students to understand economic concepts with the aid of mathematical and Statistical tools.



		2	To equip the students to quantify economic variables and to enable them to apply statistical techniques in Economics.
		3	To analyze and interpret empirical data with the help of statistical tools
8	<b>CORE COURSE VIII:</b>	1	Familiarity with different perspectives of

	<b>HETERODOX ECONOMICS (5B08 ECO)</b>		alternative schools of thought may get easily exposed to pluralistic approach to both economic theory and policy.
		2	Through such an exposure the course will enhance and diversify the knowledge profile of the students and may get opportunities to pursue higher studies and research in heterodox economics.
9	<b>CORE COURSE IX: MACROECONOMIC ANALYSIS –I (5B09 ECO)</b>	1	Students will be able to get a perspective on the working of an economy.
		2	By sharpening the macroeconomic tool box students will be able to appreciate macroeconomic policies.
		3	Enables the students to pursue higher studies in the core domain of economics

<b>10</b>	<b>CORE COURSE X: DEVELOPMENT ECONOMICS (5B10 ECO)</b>	<b>1</b>	To make the students aware of the methodological and measurement issues relating to growth and development.
		<b>2</b>	To enable the students to understand the theory and empirics of Development Economics with special reference to less developed countries
		<b>3</b>	To provide an understanding about the various development issues and the development gap between policy and practice.

<b>11</b>	<b>CORE COURSE XI: ECONOMICS OF BANKING AND FINANCE (5B 11 ECO)</b>	<b>1</b>	The students will be equipped with theoretical as well as practical aspects of the structure and working of financial system and regulatory mechanisms.
		<b>2</b>	The course is expected to expand the skill set of the students for higher studies and employment in finance
		<b>3</b>	The students will be aware of the innovations and the related trends in the field of banking and finance with special reference to instruments like derivatives.

<b>12</b>	<b>CORE COURSE XII: BASIC TOOLS FOR ECONOMIC ANALYSIS II (6B12 ECO)</b>	<b>1</b>	To enable the students to understand and interpret economic concepts with the aid of mathematical and statistical tools.
		<b>2</b>	To enable students to apply statistical techniques in Economics.
		<b>3</b>	To analyze and interpret empirical data with the help of statistical tools
<b>13</b>	<b>CORE COURSE XIII: MACROECONOMI C ANALYSIS II (6B13 ECO)</b>	<b>1</b>	Students will be equipped with a sound idea of advancements in macroeconomics with tools like IS-LM and the developments there after.
		<b>2</b>	Students will be equipped with the theories of economic fluctuations and needed policy

			intervention
		<b>3</b>	Student will be able to develop critical thinking and research inquisitiveness in macro economics
		<b>4</b>	Opportunities to higher studies and prospects for employment through the knowledge of theories and concepts in Macroeconomics will be enhanced.

<b>14</b>	<b>CORE COURSE XIV: PUBLIC ECONOMICS (6B14 ECO)</b>	<b>1</b>	Better conceptualization of the economic rationale of govt. in terms of allocation, distribution, stabilization and growth in a federal system
		<b>2</b>	Better exposure to resource mobilization by the govt. through innovative fiscal instruments like GST.
		<b>3</b>	Students are expected to get an overall perspective of public policy and the development programmes aimed at public welfare as well
<b>15</b>	<b>CORE COURSE XV: BASIC ECONOMETRIC ANALYSIS</b>	<b>1</b>	This course provides a comprehensive introduction to basic econometric concepts, methodology and techniques of analysis.
		<b>2</b>	The Students will acquire knowledge and adequate skills for the development of simple linear econometric models.
		<b>3</b>	The students will be able to perform econometric

			analysis relating to their project work and future research and development.
<b>16</b>	<b>CORE COURSE XVI: PROJECT WORK (6B16 ECO)</b>	<b>1</b>	To motivate students to enquire into recent relevant economic issues and find solutions

		2	To provide opportunity to apply the theoretical knowledge that they acquired in class room environment to the real world situations by taking up any issue as a project that requires review, explanation or solution.
		3	To enable the student to approach socio-economic issues in a theoretical perspective. The student is encouraged to collect and organize the existing information on the topic and arrive at his/her own logical conclusion by following a methodology and applying the analytical tool.
17	<b>GENERIC ELECTIVE COURSE 01: BASICS OF ECONOMICS (5D01 ECO)</b>	1	Students will have an understanding of the basic concepts of economics in everyday life
		2	Students will be able to get an idea of major economic issues

# **Programme Outcome, Programme Specific Outcome and Course Outcome**

Name of the Department: P G department of Economics

## **2014 Admission Onwards**

### **Programme Outcomes: M A Economics**

#### **PO1. Disciplinary Knowledge:**

- 1.1 Exhibit competence in the discipline
- 1.2 Analyze seminal pieces of work in the area
- 1.3 Apply disciplinary principles to conduct academic inquiry
- 1.4 Evaluate aspects of social reality using the principles of the discipline

#### **PO2. Critical Thinking:**

- 2.1 Recognize and examine the social structures underlying our society and how they shape our existence
- 2.2 Reflect upon lived experiences with reflexivity
- 2.3 Analyze and engage with their social surroundings, problematize and raise questions based on academic inquiry

#### **PO3. Research Skills:**

- 3.1 Exhibit problem solving skills, reflective thinking
- 3.2 Apply analytical and scientific thinking
- 3.3 Demonstrate technical skills in terms of handling data, working with various research related software
- 3.4 Conceptualize, design, and execute research project/s

#### **PO4. Communication and social Interaction:**

- 4.1 Communicate effectively across media in varied contexts;
- 4.2 Collaborate as members or leaders in teams in multidisciplinary settings

## **Programme Specific Outcomes**

### **PROGRAMME SPECIFIC OUTCOMES**

- PSO.1. Students should be able to develop knowledge about production, demand, market and pricing.
- PSO.2. Students should be able to develop knowledge about monetary policy and its implications in economy.
- PSO.3. Students should be able to develop knowledge about economic planning in India and recent changes in our economy.
- PSO.4. Gain knowledge regarding the implications of mathematical tools in economic planning.
- PSO. 5. Students will understand how external factors affect the functions of markets.
- PSO.6. Students should be able to develop knowledge about the major Govt. mechanisms used to rectify economic issues in a country
- PSO.7. Able to understand the role of public sector in economic development.
- PSO.8. Students should be able to develop knowledge about various statistical tools used for data interpretation.
- PSO.9. Students should be able to develop knowledge about the role of International trade in economic development.
- PSO.10. Helps to understand the basic theories of economic growth and development.
- PSO.11. Students should be able to develop knowledge about the recent trends in banking trends.
- PSO.12. Students will understand the use of mathematics and statistics in economic analysis.
- PSO.13. Students will able to understand how foreign markets influence economic development of a country.
- PSO.14. Students will able to understand the working principles of Money market and Capital market.
- PSO.15. Students should be able to develop knowledge about the role of Demand forecasting, Time value of money and Capital budgeting in business.
- PSO.16. Helps to understand the role of people's participations in Panchayath Raj system

## **Course Outcome**

Sl. No.	Name of Course (paper)	Outcomes	
<b>1</b>	<b>ECO1C01: MICROECONOMIC THEORY -I</b>	<b>i</b>	To introduce the basic principles of economic theory
		<b>ii</b>	To introduce the basic principles of Pricing strategies
		<b>iii</b>	To introduce the pricing mechanism
		<b>iv</b>	To understand the theory of production.
		<b>v</b>	To understand the basic techniques of economic analysis
		<b>vi</b>	To understand the different market condition
		<b>vii</b>	To know markets with asymmetric information
<b>2</b>	<b>ECO1C02: MACROECONOMIC THEORY- I</b>	<b>i</b>	To give a strong micro foundation to the monetary theory
		<b>ii</b>	To familiarize the students the basic difference between the classical and Keynesian economics.
		<b>iii</b>	To gives the idea about Keynesian theory of employment.
		<b>iv</b>	To introduce the basic concepts of monetary economics.
		<b>v</b>	To understand the Relative Effectiveness of Monetary and Fiscal Policies



		<b>Vi</b>	To understand the behavioural Foundations of Macro Economics
		<b>vii</b>	To understand the Theory of Demand and Supply of Money
<b>3</b>	<b>ECO1C03: QUANTITATIVE TECHNIQUES FOR ECONOMIC ANALYSIS</b>	<b>i</b>	To provide quantitative skills to collect, analyse and interpret the analytical data.
		<b>ii</b>	To provide basics for research.
		<b>iii</b>	Gives basic mathematical techniques for economic students.
		<b>iv</b>	To gives the basic foundations of statistical analysis
		<b>v</b>	To understand the different techniques for analysing the data.
		<b>vi</b>	To familiarise the concepts of matrices
		<b>vii</b>	To understand various concepts in Population and Sample
		<b>viii</b>	To familiarize the Theory of estimation
		<b>ix</b>	To learn the various tests of hypothesis
		<b>x</b>	To familiarise various concepts in Research methodology
<b>4</b>	<b>CO1C04: DEVELOPMENT</b>	<b>i</b>	To understand the structural changes happened in Indian Economy

	<b>ISSUES OF INDIAN ECONOMY (WITH SPECIAL REFERENCE TO KERALA)-1</b>	<b>ii</b>	To understand the various development issues in the Indian economy.
		<b>iii</b>	To have an overview about Demographic profile of India.
		<b>iv</b>	To understand the public spending on education and health in India.
		<b>v</b>	To understand the structure of Kerala economy.
		<b>vi</b>	To understand the growth performance of Kerala Economy.
<b>5</b>	<b>ECO2C05: MICROECONOMIC THEORY -II</b>	<b>i</b>	To understand the theory of firm
		<b>ii</b>	To evaluate Theory of product pricing
		<b>iii</b>	To get deeper understanding of Theory of distribution
		<b>iv</b>	To understand the General equilibrium model
		<b>v</b>	To familiarise the concepts under welfare economics
<b>6</b>	<b>ECO2C06: MACROECONOMIC THEORY- II</b>	<b>i</b>	To evaluate Macro Economics in an Open Economy
		<b>ii</b>	To understand the foreign exchange markets
		<b>iii</b>	To understand the Theory of Inflation and Unemployment
		<b>vi</b>	To evaluate Current Controversies in Macro

			Economics
		v	To familiarize the Macroeconomic Policies
7	<b>ECO2C07: DEVELOPMENT ISSUES OF INDIAN ECONOMY (WITH SPECIAL REFERENCE TO KERALA)-II</b>	i	To evaluate the Agricultural sector of India
		ii	To understand the Industry and Infrastructure sector of India
		iii	To understand India's role in global economy- India and Global Economy
		iv	To understand Land use and cropping pattern of Kerala Economy
		v	To understand the trends in export and foreign remittances of Kerala
8	<b>ECO2C08: PUBLIC ECONOMICS-I</b>	i	To introduce the basic principles of fiscal economics
		ii	To understand the difference between public and private finance
		iii	To understand the source of public expenditure
		iv	To understand the source of public revenue
		v	To understand the emerging issues in public debt management
		vi	To understand classical and modern concept of fiscal policy
9	<b>ECO2C09: BASIC ECONOMETRICS</b>	i	To provide knowledge about the scope of econometrics

		<b>ii</b>	To prove economic theories mathematically
		<b>iii</b>	To understand the simple linear regression model
		<b>iv</b>	To be aware about the problem of auto correlation
		<b>v</b>	To understand the issue of Multicollinearity
		<b>vi</b>	To understand the nature of Heteroscedasticity
		<b>vii</b>	To understand the simultaneous equation models
		<b>viii</b>	To understand the nature of forecasting
<b>10</b>	<b>ECO3C10: PUBLIC ECONOMICS -II</b>	<b>i</b>	To understand the role of government in national economy
		<b>ii</b>	To be aware about economic reforms of direct and indirect tax in India
		<b>iii</b>	To understand the trends of public expenditure in India
		<b>iv</b>	To make awareness about budget preparation
		<b>v</b>	To give an idea about central state financial relations
		<b>vi</b>	To gives an idea about the functions of modern welfare states
		<b>vii</b>	To understand the various stages involved in budget preparation

		<b>viii</b>	To gives an idea about functional finance
<b>11</b>	<b>ECO3C11: INTERNATIONAL ECONOMICS-I</b>	<b>i</b>	To provide knowledge about Classical Theories of Trade.
		<b>ii</b>	To understand new theories of international trade
		<b>iii</b>	To understand the terms of trade
		<b>iv</b>	To be aware about the impact of devaluation on terms of trade
		<b>v</b>	To understand the impact of international trade on economic growth
		<b>vi</b>	To be aware about the commercial policies of trade.
<b>12</b>	<b>ECO3C12: ENVIRONMENTAL ECONOMICS</b>	<b>i</b>	To have a detailed understanding of the discipline of environmental economics.
		<b>ii</b>	To understand the inter linkages between the economy and environment
		<b>iii</b>	To understand the economics of sustainable development
		<b>iv</b>	To be aware about the Climate change on Agriculture development.
		<b>v</b>	To be aware about environmental planning and management
		<b>vi</b>	To understand various methods for regulating pollution

<b>13</b>	<b>ECO3C13: FINANCIAL ECONOMICS</b>	<b>i</b>	To have an understanding on Financial System
		<b>ii</b>	To be aware about financial Sector Reforms in India
		<b>iii</b>	To understand the time value of money
		<b>iv</b>	To understand the Risk and Return
		<b>v</b>	To have a knowledge on Derivatives Market
		<b>vi</b>	To have a detailed understanding on Portfolio Management
<b>14</b>	<b>ECO4C14: INTERNATIONAL ECONOMICS-II</b>	<b>i</b>	To understand forms of economic integration
		<b>ii</b>	To aware about the exchange rate systems
		<b>iii</b>	To understand the theories of balance of payments
		<b>iv</b>	To be aware about foreign exchange markets
		<b>v</b>	To understand the theories of foreign exchange rate determination
		<b>vi</b>	To understand the international factor movements
		<b>vii</b>	To provide knowledge about the international economic organizations
<b>15</b>	<b>ECO3E01: AGRICULTURAL ECONOMICS</b>	<b>i</b>	To understand the nature and scope of agricultural economics
		<b>ii</b>	To understand the theories of agricultural development

		<b>iii</b>	To be aware about agricultural development in India
		<b>iv</b>	To understand the production function analysis in agriculture
		<b>v</b>	To understand the demand and supply of agricultural products
		<b>vi</b>	To understand the Agricultural performance of Kerala
<b>16</b>	<b>ECO4E06: PROJECT ANALYSIS</b>	<b>i</b>	To understand the Phases and Objectives of Capital Budgeting
		<b>ii</b>	To understand the Project Evaluation and Audit.
		<b>iii</b>	To understand the Project management
		<b>iv</b>	To have a knowledge on Social Cost Benefit Analysis
		<b>v</b>	To familiarise the Components of Capital Cost of a Project
		<b>vi</b>	To understand the Scope and Uses of Project Evaluation

# **Programme Outcome, Programme Specific Outcome and Course Outcome**

**Name of the Department: English**

**2014-2018 Admission (BA English)**

## **Programme Outcomes**

### **PO 1.Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

### **PO 2.Effective Citizenship:**

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

### **PO 3.Effective Communication:**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

### **PO 4.Interdisciplinarity:**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.



4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## **Programme Specific Outcomes**

### **Programme Specific Outcomes for BA in English Language and Literature**

**PSO 1.** Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

**PSO 2.** Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

**PSO 3.** Understand and apply the extended meaning of “English Literature” to various post-colonial and other writings in English.

**PSO 4.** Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women’s Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

**PSO 5.** Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

## **2019 Admission Ownwards (BA English)**

### **Programme Outcomes**

#### **PO 1.Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### **PO 2.Effective Citizenship:**

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

#### **PO 3.Effective Communication:**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

#### **PO 4.Interdisciplinarity:**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## **Programme Specific Outcomes**

### **Programme Specific Outcomes for BA in English Language and Literature**

**PSO 1.** Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

**PSO 2.** Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

**PSO 3.** Understand and apply the extended meaning of “English Literature” to various post-colonial and other writings in English.

**PSO 4.** Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women’s Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

**PSO 5.** Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

### **Course Outcome**

<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>Outcomes</b>
<b>1B01ENG</b>	<b>Malayalam Literature in English Translation</b>	CO 1: Understand the word ‘literature’ and ‘literary’ in a broad and inclusive perspective by reading select literary pieces and by applying critical reading strategies. CO 2: Recognise and describe literary genres and its subclasses. CO 3: Describe with examples select literary terms and concepts. CO 4: Understand the basic issues related to translation and in that process develop a sensibility for native and local literatures.

		<p>CO 5: Use English to translate and describe everyday activities, regional themes and personal narratives by reading Malayalam literature in translation.</p> <p>CO 5: Learn to read, enjoy, analyse and critically engage with select literary pieces on their own with minimum guidance</p>
2B02ENG	Academic Writing, Methodology and Research Project	<ol style="list-style-type: none"> <li>1. Understand and apply the nuances of academic writing.</li> <li>2. Understand the various methodological as well as epistemological aspects of literary studies.</li> <li>3. Familiarise with the approaches to literature.</li> <li>4. Choose a tentative topic for the research project to be submitted in semester six.</li> </ol>
3B03ENG	Old English to Medieval English Literature (500-1500)	<ol style="list-style-type: none"> <li>1. Have an understanding of the contexts which produced Old English literature.</li> <li>2. Read translation extracts from key texts of the Old English period</li> <li>3. Understand the key aspects of Old English language.</li> <li>4. Understand the key genres, authors, texts, styles and themes of the Medieval English Period.</li> <li>5. Read excerpts from the variety of writings produced during this period.</li> <li>6. Understand the key aspects of Medieval English dialects.</li> </ol>
3B04ENG	Renaissance and Restoration Literatures (1485-1780)	<ol style="list-style-type: none"> <li>1. Define Renaissance literature/ Problems of definition</li> <li>2. Trace the relationship between political economy, cultural history and production of arts and literature during the early modern period</li> <li>3. Read specimens of major works belonging to the Renaissance period.</li> <li>4. Understand the problematics of</li> </ol>

		<p>“modernisation” of Britain including the development of political parties and parliamentary democracy through the cultural productions of Restoration period</p> <ol style="list-style-type: none"> <li>Identify literary narratives that deal with slave trade and colonial aspirations.</li> <li>Understand the development of literary criticism as a meta-narrative to literature.</li> <li>Read specimens of major works belonging to the Restoration period.</li> </ol>
4B05ENG	The Romantic Period (1780-1832)	<ol style="list-style-type: none"> <li>Understand the cultural history of the period and recognise the features of literary romanticism</li> <li>Trace the relationship between political economy, cultural history and production of arts and literature with reference to the romantic period</li> <li>Read specimens of major works belonging to the period.</li> </ol>
4B06ENG	The Victorian Period (1832-1901)	<ol style="list-style-type: none"> <li>Understand a range of Victorian literature in relation to a range of contexts including Victorian anxieties about modernity, madness, sexual transgression and disease.</li> <li>Analyze the work of a range of Victorian writers, both canonical and less well-known, and with a range of genres including the novel, short story and poetry.</li> <li>Identify and discuss theoretical discourses concerning class, sexuality, gender and colonialism as these illuminate a range of Victorian texts.</li> <li>Understand and successfully deploy a range of terms and concepts integral to Victorian literature.</li> </ol>

5B07ENG	The Early Twentieth Century ((1901-1939)	<ol style="list-style-type: none"> <li>1. Understand the cultural, political, and stylistic protocols of modernism and its various literary movements.</li> <li>2. Trace the relationship between political economy, cultural history and production of arts and literature</li> <li>3. Read specimens of major works belonging to the period.</li> </ol>
5B08ENG	The Late Twentieth and Twenty-First Centuries(1939-2018)	<ol style="list-style-type: none"> <li>1. Understand the cultural, political, and stylistic protocols of post-modernism and the various literary movements</li> <li>2. Understand and apply the basics of the various reading strategies that emerged during the period</li> <li>3. Read specimens of major works belonging to the period.</li> </ol>
5B09ENG	Postcolonial Literatures in English	<ol style="list-style-type: none"> <li>1. Understand the meaning, scope and issues related to the term postcolonial.</li> <li>2. Read specimens of major works belonging to the genre.</li> <li>3. Familiarise with the cardinal concepts of postcolonial theory.</li> </ol>
5B10ENG	Linguistics	<ol style="list-style-type: none"> <li>1. Learn the theories regarding origin, development and history of languages.</li> <li>2. Familiarise with the cardinal concepts related to “linguistics”.</li> <li>3. Understand the modern directions in linguistic studies.</li> </ol>
6B11ENG	Project	<ol style="list-style-type: none"> <li>1. Learn and apply specific documentation styles and methodological formalities.</li> <li>2. Critically engage with a literary theme or topic.</li> <li>3. Understand the basic formalities regarding research in humanities.</li> </ol>

6B12ENG	Critical Theory	<ol style="list-style-type: none"> <li>1. Understand the basics of various theoretical positions in literary and culture studies.</li> <li>2. Apply specific theoretical insights into the study of specific works of art as well as cultural articulations.</li> <li>3. Understand the ideological assumptions underlying common-sense notions and canon formation.</li> </ol>
6B13ENG	Women's Writing	<ol style="list-style-type: none"> <li>1. Understand women's writing as a specific genre.</li> <li>2. Appreciate the variety in women's literature and the correlation between such variety and specific socio-political contexts.</li> <li>3. Understand the various dialogic positions within women's writing</li> </ol>
6B14ENG	Indian Writing in English	<ol style="list-style-type: none"> <li>1. Understand Indian Writing in English as a specific genre based on certain common sociopolitical contexts.</li> <li>2. Understand the various dialogic positions within Indian Writing in English.</li> <li>3. Understand the regional diversities and thematic plurality of IWE.</li> </ol>
6B15ENG	Film Studies	<ol style="list-style-type: none"> <li>1. Learn the basic terminology, technical aspects, and the major movements in the history of cinema.</li> <li>2. Watch select movies and analyse them with an eye on technical, thematic and socio-political aspects.</li> <li>3. Develop basic knowledge and familiarity with the various trends in Indian cinema</li> </ol>
6B16ENG	Discipline Specific Elective	

## **Details**

- **Programme outcome: It is attained in the period of UG / PG Programme -common to all UG courses (common for all PG courses).**
- **Programme specific outcome: For each UG programme, it is different. Programme specific outcomes of B.Sc Mathematics and B.Sc Physics are different.**
- **Course outcome: Paper (course) wise outcome. In the case of Mathematics there are 14 core courses, 8 complementary courses and one open course.**
- **Use 2014 syllabus to prepare PO, PSO and CO for the academic year 2018-19.**
- **Use 2019 syllabus to prepare PO, PSO and CO for the academic year 2019-20.**
- **Programme Outcome, Programme Specific Outcome and Course Outcome are included in 2019 syllabus. Collect course outcomes of each paper (course) and consolidate the same.**
- **It will be uploaded on the college website.**



# Programme Outcome, Programme Specific Outcome and Course Outcome

Name of the Department: History

## 2014-2018 Admission (BA History)

### Programme Outcomes

#### **(i)** Critical Thinking:

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### **(ii)** Effective Citizenship:

- 2.1. Learn to participate in nation-building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender-sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

#### **(iii)** Effective Communication:

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

#### **(iv)** Interdisciplinarity:

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem-solving and evolving a comprehensive perspective.

## **Programme Specific Outcomes**

- (i)** Understand factual and conceptual aspects of historical changes in multiple areas of the world
- (ii)** Think contextually and critically about the past to understand human experiences
- (iii)** Analyze why and how historical events take place based on the verification of diverse evidence and arguments
- (iv)** Design and write research papers based on primary and secondary sources
- (v)** Make logical oral presentation of factual and theoretical knowledge of historical events and changes
- (vi)** Develop rational, humanitarian, democratic and secular outlook based on historical knowledge and contemporary societal, economic and political issues

## **2019 Admission Onwards (BA History)**

### **Programme Outcomes**

#### **(i) Critical Thinking:**

1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### **(ii) Effective Citizenship:**

2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.

2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

#### **(iii) Effective Communication:**

3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a wellinformed manner.

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#### **(iv) Interdisciplinarity:**

4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.

4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

### **Programme Specific Outcomes**

**(vii)** Understand factual and conceptual aspects of historical changes in multiple areas of the world

**(viii)** Think contextually and critically about the past to understand human experiences

**(ix)** Analyze why and how historical events take place based on the verification of diverse evidence and arguments

**(x)** Design and write research papers based on primary and secondary sources

**(xi)** Make logical oral presentation of factual and theoretical knowledge of historical events and changes

- (xii) Develop rational, humanitarian, democratic and secular outlook based on historical knowledge and contemporary societal, economic and political issues

### Course Outcome

Sl. No.	Name of Course (paper)	Outcomes	
<b>1</b>	1B01 HIS : History of India I: Pre-historic Times to c.200 CE	<b>i</b>	Recognize important primary sources for the study of ancient Indian history
		<b>ii</b>	Identify early Indian settlements, centres of political and cultural importance
		<b>iii</b>	Demonstrate factual and theoretical knowledge of social, economic, cultural and political transformations in early India
		<b>iv</b>	Analyze and explain the significance of different religious and philosophical trends in ancient India
<b>2</b>	2B02HIS: Cultural Transformations in Europe	<b>i</b>	Recognize the geographic locations of Greek and Roman states and medieval towns.
		<b>ii</b>	Understand the broad pattern of political and cultural changes in Europe before 1500 CE
		<b>iii</b>	Discuss cultural and intellectual legacies of Greek and Roman civilizations to Modern West
		<b>iv</b>	Evaluate cultural differences between ancient and medieval societies in Europe
<b>3</b>	3B03HIS: History of India II: Polity, Society and Culture (c.200-1206)	<b>i</b>	Understand factual knowledge of social and political formations
		<b>ii</b>	Locate major centres political and cultural importance in India
		<b>iii</b>	Explain theories of social formation and feudalism in Indian history
		<b>iv</b>	Analyze the intellectual and cultural legacy of ancient and early Medieval India
<b>4</b>	3B04 HIS:History of Kerala I: Earliest Times to c. 1500 CE	<b>i</b>	Identify sources for the study of ancient and medieval Kerala history
		<b>ii</b>	Locate prehistoric and early historic settlements, ports, towns and political boundaries in Kerala
		<b>iii</b>	Describe social, economic, political and cultural formations of Kerala in ancient and medieval times
		<b>iv</b>	Produce well researched written work on any aspects of Kerala history using primary and secondary sources
<b>5</b>	4B05 HIS: History of India III: Sultanate to British Conquest (1206 -1757)	<b>i</b>	Understand socio-political formations in Medieval India
		<b>ii</b>	Describe the evolution of Indo-Saracenic art and architecture
		<b>iii</b>	Analyze and explain the formation of secular political values in India

		<b>iv</b>	Locate centres of cultural, political and commercial importance
<b>6</b>	4B06 HIS : Ideologies and Revolutions in the Modern World	<b>i</b>	Understand the origin, stages and results of selected revolutions in the modern world
		<b>ii</b>	Analyze and explain different interpretations of world revolutions
		<b>iii</b>	Relate the results of modern world revolutions to contemporary developments in the world
		<b>iv</b>	Produce written work on ideological, humanistic and secular aspects of any of the modern world revolutions
<b>7</b>	5B07 HIS : History of India IV: Colonial Transformations (1757-1885)	<b>i</b>	Understand the concept of colonialism and its historiography in India
		<b>ii</b>	Discuss critically the impact of colonial policies in political, social, economic and cultural life of Indians
		<b>iii</b>	Assess the influence of social and religious reforms in the modernization of India
		<b>iv</b>	Analyze and explain how anti-colonial movements originated in the nineteenth century
		<b>v</b>	Identify major centres of commerce and anti-colonial movements
<b>8</b>	5B08HIS: History of India V: Making of the Nation (1885-1947)	<b>i</b>	Understand the political, social and economic background of freedom struggle
		<b>ii</b>	Specify major stages of freedom struggle and their ideological distinctions
		<b>iii</b>	Analyze the role of the nationalist movement in the making of modern India
		<b>iv</b>	Develop an attitude of nationalism cutting across limited boundaries of religion and caste in order to resist communal forces
<b>9</b>	5B09HIS: History of Kerala II: Making of Modern Kerala (1500 to 1970)	<b>i</b>	Understand factual knowledge of modern Kerala history
		<b>ii</b>	Explain political, social, cultural, religious and intellectual factors that led to the formation of modern Kerala
		<b>iii</b>	Analyze and discern the influence of caste and communal organizations in Kerala society and politics
		<b>iv</b>	Understand the significance of secular and egalitarian values and forces in the making of the cultural identity of Kerala
<b>10</b>	5B10HIS: Method and Writing of History	<b>i</b>	Distinguish between primary and secondary sources
		<b>ii</b>	Use historical and interdisciplinary methods of research and research tools
		<b>iii</b>	Analyze and synthesize historical data collected from different sources
		<b>iv</b>	Create reasonable arguments and interpretations with the support of documentary evidence

		<b>v</b>	Write well-researched article on any historical events and leaders
<b>11</b>	5B11HIS: Historiography: Perspectives & Practices	<b>i</b>	Understand basic terms, concepts and categories of historiography
		<b>ii</b>	Describe the origin and growth of history as a branch of knowledge from ancient times
		<b>iii</b>	Analyze and explain ideological and methodological foundations of historical writing in the ancient, medieval and modern period in world history
		<b>iv</b>	Discuss the relevance of interdisciplinary research and objectivity in historical writings
<b>12</b>	6B12HIS: History of India VI: Developments since Independence (1947-2000)	<b>i</b>	Understand political, economic and cultural changes after independence
		<b>ii</b>	Assess the role of India at the global level as an active member in international organisations
		<b>iii</b>	Critically examine and explain the growth of communal forces in independent India
		<b>iv</b>	Analyse and discuss the condition of marginalised communities in independent India
<b>13</b>	6B13HIS: History of the Contemporary World (1945 -2000)	<b>i</b>	Understand major political issues and events in the world since World War II.
		<b>ii</b>	Analyze international problems in the context of diverse political interests and ideological movements
		<b>iii</b>	Interpret the present political issues in relation to pertinent international events in the twentieth century
		<b>iv</b>	Develop the anti-colonial and anti-racist attitude and universal citizen concept
<b>14</b>	6B14HIS :Indian Historiography	<b>i</b>	Understand the historical traditions and writings in Ancient and Medieval India
		<b>ii</b>	Demonstrate a comprehensive understanding of the origin and growth of major schools of modern Indian historiography
		<b>iii</b>	Explain theoretical and methodological differences in historical writings
		<b>iv</b>	Develop a critical approach in assessing the work of a historian
<b>15</b>	6B15HIS: PROJECT	<b>i</b>	Learn how to select a research topic and prepare a research plan/ proposal
		<b>ii</b>	Understand processes of data collection and research methods
		<b>iii</b>	Undertake critical analysis of data and make interpretations
		<b>iv</b>	Prepare a well written and authentic research work with proper references and select bibliography
<b>16</b>	6B16 HIS-A: Gender and Society in India	<b>i</b>	Understand basic concepts related to gender in Indian society
		<b>ii</b>	Explain central theoretical studies in gender studies

		iii	Assess and interpret why gender discriminations and oppressions take place in India
		iv	Develop an attitude and awareness to treat a woman as an equal human being and respect their rights

## Details

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- **Course outcome:** Paper (course) wise outcome. In the case of Mathematics their are 14 core courses, 8 complementary courses and one open course.
- Use the 2014 syllabus to prepare PO, PSO and CO for the academic year 2018-19.
- Use the 2019 syllabus to prepare PO, PSO and CO for the academic year 2019-20.
- **Programme Outcome, Programme Specific Outcome and Course Outcome are included in the 2019 syllabus. Collect course outcomes of each paper (course) and consolidate the same.**
- **It will be uploaded on the college website.**

# **Programme Outcome, Programme Specific Outcome and Course Outcome**

Name of the Department: **Commerce**

## **2014-2018 Admission (BCom Finance)**

### **Programme Outcomes**

#### **PO 1. Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

#### **PO 2. Effective Citizenship:**

- 2.1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.
- 2.2. Develop and practice gender sensitive attitudes, environmental awareness, empathetic social awareness about various kinds of marginalisation and the ability to understand and resist various kinds of discriminations.
- 2.3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post-colonial society.

#### **PO 3. Effective Communication:**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language



- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

**PO 4. Interdisciplinarity:**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

### **Programme Specific Outcomes**

1. Understand the concepts and techniques of commerce and its application in business environment.
2. Conceive the ideas on entrepreneurship and develop the skills for setting up and management of business organizations.
3. Develop the skills and abilities to become competent and competitive in the business world.
4. Develop the competency to take wise decisions at personal and professional level.
5. Appraise the impact of other disciplines on the working of business.

## **2019 Admission Onwards(BCom Finance)**

### **Programme Outcomes**

#### **PO 1. Critical Thinking:**

- 1.1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.
- 1.2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.
- 1.3 Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

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#### **PO 3. Effective Communication:**

- 3.1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language
- 3.2. Learn to articulate, analyse, synthesise, and evaluate ideas and situations in a well-informed manner.
- 3.3. Generate hypotheses and articulate assent or dissent by employing both reason and creative thinking.

**PO 4. Interdisciplinarity:**

- 4.1. Perceive knowledge as an organic, comprehensive, interrelated and integrated faculty of the human mind.
- 4.2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.
- 4.3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

**Programme Specific Outcomes**

6. Understand the concepts and techniques of commerce and its application in business environment.
7. Conceive the ideas on entrepreneurship and develop the skills for setting up and management of business organizations.
8. Develop the skills and abilities to become competent and competitive in the business world.
9. Develop the competency to take wise decisions at personal and professional level.
10. Appraise the impact of other disciplines on the working of business.

**Course Outcomes**

Sl. No.	Name of Course (paper)	Outcomes	
Semester 1			
1	1A11COM - BUSINESS STATISTICS AND BASIC NUMERICAL SKILLS	i	Define statistics and explain its importance, scope, applications and limitations
		ii	Understand the basic knowledge of statistical techniques, which are applicable to business.
		iii	Understand basic concepts in mathematics, which are applied in the managerial decision making.
		iv	Develop the basic mathematical skill needed for analyzing numeric problems related to business
2	1B01 COM	i	Understand the evolution of management thoughts,

	<b>-MANAGEMENT CONCEPTS AND PRINCIPLES</b>		concept of management, scope and its functions.
		<b>ii</b>	Familiarize with current management practices.
		<b>iii</b>	Understand the importance of ethics in business
		<b>iv</b>	Acquire knowledge and capability to develop ethical practices for effective management.
		<b>v</b>	Describe the emerging trends in management.
<b>Semester 2</b>			
<b>3</b>	<b>2B02 COM -FUNCTIONAL APPLICATIONS OF MANAGEMENT</b>	<b>i</b>	Describe nature and scope of financial management and the elements in the management of finance.
		<b>ii</b>	Enumerate marketing management and its different aspects.
		<b>iii</b>	Explain Human Resources Management and the activities involved in it.
		<b>iv</b>	Understand the modern global marketing trends and its challenges.
<b>4</b>	<b>2C01 COM QUANTITATIVE TECHNIQUE FOR BUSINESS DECISIONS</b>	<b>i</b>	Acquaint with the basic statistical tools, which can be applied in business and economic situations.
		<b>ii</b>	Develop knowledge in quantitative techniques, which help in tackling various problems for modern business.
		<b>iii</b>	Understand and solve problems in probability, correlation and regression.
		<b>iv</b>	Understand the effect of trend and seasonal variations on business.
		<b>v</b>	Familiarize with the testing of hypothesis.
<b>Semester 3</b>			
<b>5</b>	<b>3A12 COM -ENTREPRENEUR</b>	<b>i</b>	Identify the characteristics of an entrepreneur
		<b>ii</b>	Describe the importance of entrepreneurs in the economic development of a nation

	<b>SHIP DEVELOPMENT</b>	<b>iii</b>	Identify the different types of entrepreneurs
		<b>iv</b>	To strengthen their skill and quality as an entrepreneur
<b>6</b>	<b>3B03 COM -ADVANCED ACCOUNTING</b>	<b>i</b>	Understand the theoretical and practical knowledge of the basics of accounting.
		<b>ii</b>	Acquire the knowledge of accounting for royalty, Consignment and Hire Purchase
		<b>iii</b>	Imbibe the accounting concepts of Inland Branch Business.
		<b>iv</b>	Comprehend the procedure for determining profit and financial position from incomplete records.
<b>7</b>	<b>3B04 COM -FINANCIAL MANAGEMENT</b>	<b>i</b>	Understand the concept, importance and techniques of capital budgeting.
		<b>ii</b>	Gain knowledge about sources and uses of working capital and significance of working capital management.
		<b>iii</b>	Explain optimum capital structure, theories of capital structure, distinguish between financial and operating leverage
		<b>iv</b>	Describe the concept of cost of capital and compute the component cost of capital and weighted average cost of capital.
		<b>v</b>	Differentiate the types of dividend, explain dividend policy and factors affecting dividend policy
<b>8</b>	<b>3C02 COM -BUSINESS REGULATORY FRAMEWORK</b>	<b>i</b>	Understand the nature of contracts and the essential elements of a valid contract
		<b>ii</b>	Explain the difference between a valid contract and a void contract
		<b>iii</b>	Understand the breach of contract and remedies available for a breach of contract
		<b>iv</b>	Understand various kinds of special contracts like indemnity, guarantee, bailment and agency contract
<b>9</b>	<b>3C03 COM -BUSINESS</b>	<b>i</b>	Understand the concept of economics and its use in business
		<b>ii</b>	Understand the concept of demand, elasticity and

	<b>ECONOMICS</b>		demand forecasting
		<b>iii</b>	Understand production function and law of production
		<b>iv</b>	Understand the methods of determining price of a product
		<b>v</b>	Understand the methods of determining price of a product
		<b>vi</b>	Conceive the developmental issues of Indian economy and Kerala economy
<b>Semester 4</b>			
<b>10</b>	<b>4A13 COM -GENERAL INFORMATICS SKILLS</b>	<b>i</b>	Explain the Fundamentals of Computers the use of computers in day-to-day application
		<b>ii</b>	Up to date and expand the basic informatics skills necessary in the emerging knowledge society
		<b>iii</b>	Effectively utilize the digital knowledge resources for their studies
		<b>iv</b>	State the areas where IT can be used effectively
		<b>v</b>	Perform accounting by using the appropriate accounting packages
<b>11</b>	<b>4A14 COM -ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT</b>	<b>i</b>	Understand the components of environment and need for the protection of environment
		<b>ii</b>	Understand the effect of pollution on environment and the ways of protecting the environment
		<b>iii</b>	Explain the social issues relating to environmental pollution
		<b>iv</b>	Clearly understand the various environmental hazards and the ways of managing disaster.
<b>12</b>	<b>4B05 COM -CORPORATE ACCOUNTING</b>	<b>i</b>	Understand the mode of presentation and understanding of financial reporting
		<b>ii</b>	Learn the accounting procedure for recording transaction relating to the issue and redemption of shares and debentures
		<b>iii</b>	Imbibe the techniques of recording transactions in respect of amalgamation, reconstruction and liquidation of companies.
		<b>iv</b>	Understand the concept of IFRS and Ind AS
<b>13</b>	<b>4B06 COM</b>	<b>i</b>	Understand the concept of investment and risk

	<b>-INVESTMENT MANAGEMENT</b>	<b>ii</b>	Explain the different types of securities and their schemes
		<b>iii</b>	Develop a thorough knowledge about security market, its participants and factors affecting security market
		<b>iv</b>	Conduct fundamental and technical analysis of investments in the security market
		<b>v</b>	Discuss the application of Portfolio Theory, process of portfolio management and measurement of portfolio performance.
<b>14</b>	<b>4C04 COM -CORPORATE LAW AND BUSINESS REGULATIONS</b>	<b>i</b>	Understand the provisions of Companies Act 2013
		<b>ii</b>	Describe the procedure for the formation, registration and winding up of the company
		<b>iii</b>	Explain various kinds of companies and the authorities of companies in India
		<b>iv</b>	Understand the management and administration of Companies
<b>Semester 5</b>			
<b>15</b>	<b>5B07 COM -BUSINESS RESEARCH METHODOLOGY</b>	<b>i</b>	Understand the fundamental aspects of research in business
		<b>ii</b>	Identify and define research problem
		<b>iii</b>	Formulate research plan
		<b>iv</b>	Understand various methods of collecting data
		<b>v</b>	Prepare research report themselves
<b>16</b>	<b>5B08 COM - INCOME TAX LAW AND PRACTICE</b>	<b>i</b>	Define the basic concepts in Income tax, explain its evolution
		<b>ii</b>	Determine the residence and incidence of Tax
		<b>iii</b>	Understand the incomes exempt from tax of an individual
		<b>iv</b>	Compute income under different heads of income
<b>17</b>	<b>5B09 COM - COST ACCOUNTING</b>	<b>i</b>	Explain the nature, scope, objectives and limitations of costing
		<b>ii</b>	Identify the elements of cost and describe the methods of their ascertainment and control
		<b>iii</b>	Explain the various methods of costing and their suitability for different industries
		<b>iv</b>	Ascertain the cost of production of products and jobs

18	5B10 COM -BANKING PRINCIPLES AND OPERATIONS	i	Explain banking and describe the different types of banks and the functions of commercial bank
		ii	Narrate the role of RBI in the credit control, promotion and regulation of monetary system
		iii	Describe the relationship between banker and customer and the procedure for opening and operating the account
		iv	Understand the modern trends and technology used in banking
19	5B11 COM - GOODS AND SERVICE TAX	i	Understand the basic concept of GST.
		ii	Explain how GST is levied and collected.
		iii	Describe IGST, its levy and collection
		iv	Familiarise with the preparation of invoice and filing of return under GST
20	5D01 COM - BASIC ACCOUNTING	i	Describe the basic accounting concepts
		ii	Record the business transactions in the proper books of accounts
		iii	Prepare financial statements of a sole trading concern
Semester 6			
21	6B12 COM - FINANCIAL MARKETS AND SERVICES	i	Understand the financial system and its constituents
		ii	Familiarise with the activities taking place in the financial markets
		iii	Appraise the various financial services available in the financial markets
		iv	Acquire knowledge about financial derivatives and their features
22	6B13 COM -MANAGEMENT ACCOUNTING	i	Understand the fundamental concepts of management accounting
		ii	Acquire analytical skills associated with the interpretation of accounting reports
		iii	Apply management accounting concepts in real life situations
		iv	Develop judgmental skills associated with the use of accounting information in decision making
		v	Understand the use of marginal costing and budgetary control to plan and control cost and profit.
23	6B14 COM	i	Understand the term auditing, its concept, principles,



	<b>-AUDITING AND CORPORATE GOVERNANCE</b>		procedures and requirements needed for Auditing in accordance with current legal requirements and professional standards
		<b>ii</b>	Familiarize with the various aspects of audit consisting of internal check, vouching, verification and valuation of assets and liabilities
		<b>iii</b>	Understand the appointment, rights, duties and the liabilities of an auditor.
		<b>iv</b>	Explain the concept of Corporate Governance and its aspects
<b>24</b>	<b>6B15 COM - INCOME TAX AND GST</b>	<b>i</b>	Compute total income and determine the tax liability of an individual and partnership firm, company and cooperative society
		<b>ii</b>	Describe the income tax authorities, their powers and assessment procedure
		<b>iii</b>	Explain the procedure regarding deduction of tax at source, advance tax, refund, penalties and prosecution
		<b>iv</b>	Describe Goods and Service Tax, its levy and collection
<b>25</b>	<b>6B16 COM -CORPORATE TAX PLANNING</b>	<b>i</b>	Understand the concept of tax planning and determine the tax liability of companies
		<b>ii</b>	Understand the methods of reducing tax liability through proper tax planning
		<b>iii</b>	Take financial and managerial decisions after considering the impact of direct tax laws
<b>26</b>	<b>6B17 COM -PROJECT</b>	<b>i</b>	Understand the method of carrying out a project
		<b>ii</b>	Undertake project work independently

## **Programme Outcome, Programme Specific Outcome and Course Outcome**

**Name of the Department: Malayalam**

**2014-2018 Admission (BA Malayalam)**

### **Programme Outcomes**

#### **PO1. Critical thinking**

1. Acquire the ability to apply the basic tenets of logic and Science to thoughts, actions and interventions.
2. Develop the ability to chat about a progressive direction for actions and interventions by learning to recognise the presence of hegemonic ideology within certain dominant notions.
3. develop self-critical abilities and also the ability to view positions problems and social issues from plural perspectives.

#### **PO2. Effective citizenship**

1. Learn to participate in nation-building by adhering to the principles of sovereignty of national socialism, secularism, democracy and the values that guide a republic.
2. develop and practice gender-sensitive attitudes environmental awareness the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.

#### **PO3. effective communication**

1. Acquire the ability to speak right and listen clearly in person and through electronic media in both English and one modern Indian language.
2. Learn to articulate, analyse, synthesise and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent and dissent by employing both reason and creative thinking.

## **PO.4 Interdisciplinary**

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind.
2. Understand the issues of environmental contacts and sustainable development as a basic in the disciplinary consent of all disciplines.
3. develop aesthetic social humanistic and artistic sensibilities for problem-solving and evolving a comprehensive perspective.

## **Programme Specific Outcomes**

**PSO1.** മാതൃഭാഷ യോടും സംസ്കാരത്തോടുമുള്ള അഭിരുചി വികസിപ്പിക്കത്തക്കരീതിയിൽ സാഹിത്യപഠനത്തെ പ്രയോജനപ്പെടുത്തുന്നു.

**PSO2.** മലയാളത്തിലെ വിവിധ സാഹിത്യ ജനസ്പെക്ഷുകളെ ആസ്വദിക്കുകയും അവയുടെ ചരിത്രപരമായ വികാസ പരിണാമത്തെ തിരിച്ചറിയുകയും ചെയ്യുന്നു.

**PSO3.** സൈദ്ധാന്തികവും ലാവണ്യാത്മകവുമായ ജ്ഞാനമേഖലകളെ പരിചയപ്പെടുത്തുകയും സാഹിത്യ ആസ്വാദനത്തിനും വിമർശനാത്മക വിശകലനത്തിനും പ്രയോജനപ്പെടുത്തുകയും സർഗാത്മക രചന നടത്താനുള്ള പ്രേരണ രൂപപ്പെടുത്തുന്നു.

**PSO4.** വ്യാകരണവും ഭാഷാശാസ്ത്രപരവുമായ അവബോധം രൂപപ്പെടുത്തുകയും പ്രയോഗപരവും ആശയവിനിമയ പരവുമായ കഴിവുകൾ വികസിപ്പിക്കുകയും ചെയ്യുന്നു.

**PSO5.** വിവരസാങ്കേതികവിദ്യയും മാധ്യമങ്ങളും മലയാളഭാഷയും തമ്മിലുള്ള വിനിമയ സാധ്യതകൾ പഠിക്കുകയും പ്രയോഗിക്കുകയും ചെയ്യുന്നു.

**PSO6.** വടക്കേ മലബാറിന്റെ സാംസ്കാരിക സവിശേഷതകളെ അടുത്തറിയാനും സവിശേഷമായി പഠിക്കാനും പൂർവ്വ ധാരണകളെ പുനർനിർമ്മിക്കാനും ഉള്ള ശേഷി നേടുന്നു. കേരളം, സംസ്കാരം, നാടോടി വിജ്ഞാനം എന്നിവയിൽ സവിശേഷ ജ്ഞാനം ആർജ്ജിക്കുന്നു.

**PSO7.** സംസ്കാരപഠനത്തിന്റെ രീതിശാസ്ത്രത്തെ ഉപയോഗപ്പെടുത്തി സാഹിത്യപഠനം നിർവ്വഹിക്കുകയും ഗവേഷണ അഭിരുചി രൂപപ്പെടുത്തുകയും ചെയ്യുന്നു.

**PSO8.** കേരളത്തിലെ അരികു വൽകൃത സ്വത്വങ്ങളെ തിരിച്ചറിയുകയും ആധുനിക വിശകലനം നടത്തുകയും ചെയ്യുന്നു.

**PSO9.** പഠന യാത്രകളിലൂടെ കേരളത്തിന്റെ സാംസ്കാരിക മൂല്യങ്ങൾ നേരിട്ട് പരിചയപ്പെടുന്നു.

## **2019 Admission Onwards(BA Malayalam)**

### **Programme Outcomes**

#### **PO1. Critical thinking**

1. Acquire the ability to apply the basic tenets of logic and Science to thoughts, actions and interventions.
2. Develop the ability to chat about a progressive direction for actions and interventions by learning to recognise the presence of hegemonic ideology within certain dominant notions.
3. Develop self-critical abilities and also the ability to view positions problems and social issues from plural perspectives.

#### **PO2. Effective citizenship**

1. Learn to participate in nation-building by adhering to the principles of sovereignty of national socialism, secularism, democracy and the values that guide a republic.
2. Develop and practice gender-sensitive attitudes environmental awareness the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.

#### **PO3. effective communication**

1. Acquire the ability to speak right and listen clearly in person and through electronic media in both English and one modern Indian language.
2. Learn to articulate, analyse, synthesise and evaluation of situations and themes in a well-informed manner.
3. Generate hypothesis and articulate assent and dissent by employing both reason and creative thinking.

## **PO.4 Interdisciplinary**

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind.
2. Understand the issues of environmental contacts and sustainable development as a basic in the disciplinary consent of all disciplines.
3. Develop aesthetic social humanistic and artistic sensibilities for problem-solving and evolving a comprehensive perspective.

## **Programme Specific Outcomes**

**PSO1.** മാതൃഭാഷ യോടും സംസ്കാരത്തോടുമുള്ള അഭിരുചി വികസിപ്പിക്കത്തക്കരീതിയിൽ സാഹിത്യപഠനത്തെ പ്രയോജനപ്പെടുത്തുന്നു.

**PSO2.** മലയാളത്തിലെ വിവിധ സാഹിത്യ ജനസ്പദങ്ങളെ ആസ്വദിക്കുകയും അവയുടെ ചരിത്രപരമായ വികാസ പരിണാമത്തെ തിരിച്ചറിയുകയും ചെയ്യുന്നു.

**PSO3.** സൈദ്ധാന്തികവും ലാവണ്യാത്മകവുമായ ജ്ഞാനമേഖലകളെ പരിചയപ്പെടുത്തുകയും സാഹിത്യ ആസ്വാദനത്തിനും വിമർശനാത്മക വിശകലനത്തിനും പ്രയോജനപ്പെടുത്തുകയും സർഗാത്മക രചന നടത്താനുള്ള പ്രേരണ രൂപപ്പെടുത്തുന്നു.

**PSO4.** വ്യാകരണവും ഭാഷാശാസ്ത്രപരവുമായ അവബോധം രൂപപ്പെടുത്തുകയും പ്രയോഗപരവും ആശയവിനിമയ പരവുമായ കഴിവുകൾ വികസിപ്പിക്കുകയും ചെയ്യുന്നു.

**PSO5.** വിവരസാങ്കേതികവിദ്യയും മാധ്യമങ്ങളും മലയാളഭാഷയും തമ്മിലുള്ള വിനിമയ സാധ്യതകൾ പഠിക്കുകയും പ്രയോഗിക്കുകയും ചെയ്യുന്നു.

**PSO6.** വടക്കേ മലബാറിന്റെ സാംസ്കാരിക സവിശേഷതകളെ അടുത്തറിയാനും സവിശേഷമായി പഠിക്കാനും പൂർവ്വ ധാരണകളെ പുനർനിർമ്മിക്കാനും ഉള്ള ശേഷി നേടുന്നു. കേരളം, സംസ്കാരം, നാടോടി വിജ്ഞാനം എന്നിവയിൽ സവിശേഷ ജ്ഞാനം ആർജ്ജിക്കുന്നു.

**PSO7.** സംസ്കാരപഠനത്തിന്റെ രീതിശാസ്ത്രത്തെ ഉപയോഗപ്പെടുത്തി സാഹിത്യപഠനം നിർവ്വഹിക്കുകയും ഗവേഷണ അഭിരുചി രൂപപ്പെടുത്തുകയും ചെയ്യുന്നു.

**PSO8.** കേരളത്തിലെ അരികു വൽകൃത സ്വത്വങ്ങളെ തിരിച്ചറിയുകയും ആധുനിക വിശകലനം നടത്തുകയും ചെയ്യുന്നു.

**PSO9.** പഠന യാത്രകളിലൂടെ കേരളത്തിന്റെസാംസ്കാരിക മൂല്യങ്ങൾ നേരിട്ട് പരിചയപ്പെടുന്നു.

## Course Outcomes

### 1B01MAL മലയാള കവിത

**CO1.** ആധുനികം ആധുനികാനന്തരം മലയാളത്തിലെ അതിലെ ആധുനിക ആധുനികാനന്തര അര കവിതയെക്കുറിച്ച് കുറിച്ച് ആഴത്തിലുള്ള അവബോധമുണ്ടാക്കുക.

**CO2 .** കവിതയും സാംസ്കാരിക ചരിത്രവും തമ്മിലുള്ള വിനിമയങ്ങളെക്കുറിച്ച് ബോധ്യം ഉണ്ടാക്കുക.

**CO3.** ഭാഷയുടെ അതി സാദൃശ്യപരമായ കവിതയിൽ ആസ്വാദന ശേഷിർദ്ധിപ്പിക്കുക.

**CO4.** സർഗാത്മക ശേഷി പരിപോഷിപ്പിക്കുക.

### 2B02MAL ചെറുകഥാസാഹിത്യം

**CO1.** സാമാന്യമായ സാഹിത്യ പരിചയവും വായനാഭിരുചിയും ആസ്വാദനശേഷിയും വളർത്തിയെടുക്കുക.

**CO2.** ചെറു കഥാസാഹിത്യത്തിലെ ഭാവുകത്വ പരിണാമങ്ങൾ തിരിച്ചറിയുകകാലഘട്ടത്തിന്റെ പൊതു പ്രവണതകളും ഉദാത്ത ജീവിത വീക്ഷണവും എഴുത്തിൽ പ്രകടമാകുന്നത് അനുഭവിക്കുക.

**CO3.** പ്രമേയത്തിലും അവതരണത്തിലും ആഖ്യാനത്തിലുമുള്ള ചലനങ്ങൾ, കഥയുടെ രാഷ്ട്രീയം, സമകാല കഥയിലെ പലമ,ഉത്തരാധുനിക എഴുത്തു എന്നിവ വിലയിരുത്തുകയും അവതരിപ്പിക്കുകയും ചെയ്യുക.

**CO4.** ആധുനിക ജീവിതത്തിലെ കലുഷ തരൾ, സ്വത്വസംഘർഷങ്ങൾഅവതരണത്തിലെ പരീക്ഷണങ്ങൾ തുടങ്ങിയവ മനസ്സിലാക്കുക.

### 3B04MAL മലയാള സാഹിത്യവിമർശനം

**CO1.** വിമർശനം എന്ന സാഹിത്യ ഗണത്തെ പറ്റി റ്റി സൈദ്ധാന്തികവും യോഗികവുമായ അവബോധമുണ്ടാക്കുക.

**CO2.** മലയാള വിമർശനത്തിന് ഉൽഭവം വളർച്ച വികാസപരിണാമങ്ങൾ സമകാലീന വിമർശനം എന്നിവ ചരിത്രാത്മകമായി മനസ്സിലാക്കുക.

**CO3.** മലയാളത്തിലെ പ്രധാന വിമർശകർ, വിമർശന സമീപനങ്ങൾ, സമകാലീന വിമർശനം എന്നിവയെപ്പറ്റി ധാരണയുണ്ടാക്കുക.

**CO4.** വിമർശന ചരിത്രങ്ങളുടെ പുനർവായനകൾക്കും അവയുടെ വിമർശനാത്മകമായ അപഗ്രഥനങ്ങൾക്കും പ്രേരണ നൽകുക.

**CO5.** സാഹിത്യ കൃതികളെ നിരൂപണം ചെയ്യുന്നതിന് പ്രചോദനവും പരിശീലനം നൽകുക.

### **3B04MAL ഇന്ത്യൻ കാവ്യസിദ്ധാന്തങ്ങൾ**

**CO1.** ഇന്ത്യയിൽ തന്നെ ഉണ്ടായിട്ടുള്ള വ്യത്യസ്തമായ ലാവണ്യശാസ്ത്രസിദ്ധാന്തങ്ങളിലൂടെയും വിമർശനാത്മകമായി വിലയിരുത്താനും ഉള്ള ശേഷി നേടുന്നു.

**CO2.** സാഹിത്യ പഠനവും സിദ്ധാന്തപഠനവും തമ്മിലുള്ള പാരസ്പര്യം തിരിച്ചറിയുന്നു.

**CO3.** കാവ്യസൗന്ദര്യഘടകങ്ങളെ കണ്ടെത്തുന്നു.

**CO4.** സർഗാത്മക പ്രക്രിയയെ പറ്റിയുള്ള സൂക്ഷ്മമായ ചിന്താലോകനത്തെപ്പറ്റി ധാരണ നേടുന്നു.

### **IV B05MAL പാശ്ചാത്യ സാഹിത്യ സിദ്ധാന്തങ്ങൾ**

**CO1.** പാശ്ചാത്യ കലാചിന്തകളെ സാമാന്യമായി പരിചയപ്പെടുന്നു.

**CO2.** പാശ്ചാത്യസിദ്ധാന്തങ്ങളുടെ ചരിത്രപരമായ വളർച്ചയും വികാസവും തിരിച്ചറിയുന്നു.

**CO3.** കലാസിദ്ധാന്തങ്ങളെ പറ്റിയുള്ള വിപുലമായ ചിന്താധാരകളെ അപഗ്രഥിക്കാനുള്ള ശേഷി നേടുന്നു.

**CO4.** സാഹിത്യ നിരൂപണത്തിൽ പ്രസ്തുത സിദ്ധാന്തങ്ങൾ ചെലുത്തുന്നതെപ്പറ്റി മനസ്സിലാക്കാനുള്ള താല്പര്യം രൂപപ്പെടുന്നു.

### **4B06MAL മധ്യകാല സാഹിത്യം**

**CO1.** പാട്ട്, മണിപ്രവാളം, സന്ദേശകാവ്യങ്ങൾ, ചമ്പുക്കൾ എന്നീ പ്രാചീന മധ്യകാല സാഹിത്യ രൂപങ്ങളുടെ ആസ്വാദനവും വിശകലനവും.

**CO2.** പ്രാചീന ഗദ്യ സാഹിത്യത്തെക്കുറിച്ചുള്ള സാമാന്യ ധാരണ നേടുക.

**CO3.** കൃഷ്ണഗാഥ, കിളിപ്പാട്ട്, വഞ്ചിപ്പാട്ട്, പാന, ആട്ടക്കഥ തുടങ്ങിയ സാഹിത്യ രൂപങ്ങളുടെ പരിചയവും ആസ്വാദനവും.

**CO4.** മധ്യ കാലഗദ്യസാഹിത്യത്തെക്കുറിച്ച് സാമാന്യധാരണ നേടുക.

**CO5.** വെണ്ണണി, മറുപച്ചമലയാള പ്രസ്ഥാനങ്ങൾ, വിലാപകാവ്യഘടകൻ, തെക്കൻ പാട്ടുകൾ എന്നിവ മലയാളകവിതയുടെ ഭാവുകത്വപരിണാമത്തിൽ ചെലുത്തിയ സ്വാധീനത്തെക്കുറിച്ച് ബോധമുണ്ടാക്കുക.

**CO6.** ആധുനിക മലയാളഗദ്യരൂപീകരണത്തെക്കുറിച്ച് സാമാന്യധാരണ നേടുക.

**CO7.** പ്രാചീന മധ്യകാല കൃതികളുടെ പ്രതിപാദ്യ പ്രതിപാദന സവിശേഷതകളെക്കുറിച്ച് വിദ്യാർത്ഥികളിൽ സാമാന്യധാരണ ഉണ്ടാക്കുക.