



**UNIVERSITY OF MYSORE**  
**YUVARAJA'S COLLEGE, MYSORE**  
 (A Constituent Autonomous College with Potential for Excellence)  
 (Accredited "A" Grade with CGPA 3.34 by NAAC)



Under graduate (Bachelor) and Integrated M.Sc. Integrated Programs offered in Yuvaraja's College (Autonomous):

1. Bachelor of Science (B.Sc.) :
2. Bachelor of Computer Applications (BCA):
3. Bachelor of Business Administration (B.B.A.):
4. M.Sc. Integrated (5 Years)

The objectives and outcomes of the above programs and program specific subjects and courses are given further. Following table shows the programs and program specific subjects and the courses introduced as per NEP 2020 during the academic year 2021-22 for undergraduate and and 5 Year Integrated M.Sc.

Sl. No	Program	Program Code	No of Program specific disciplines with code	Program Specific code	Page No. PSO & CO
1	B.Sc.	BSCNEPYCM	<b><u>Core Disciplines: Any two have to be opted as per intake fixation order from University. (Fourteen):</u></b>		
	B.Sc.	BSCNEPYCM	1. Biochemistry	BSCNEPBICYCM	4-6
	B.Sc.	BSCNEPYCM	2. Biotechnology	BSCNEPBITYCM	7-8
	B.Sc.	BSCNEPYCM	3. Botany	BSCNEPBOTYCM	9-10
	B.Sc.	BSCNEPYCM	4. Chemistry	BSCNEPCHEYCM	10-14
	B.Sc.	BSCNEPYCM	5. Computer Science	BSCNEPCOMYCM	14-17
	B.Sc.	BSCNEPYCM	6. Electronics	BSCNEPELEYCM	17-21
	B.Sc.	BSCNEPYCM	7. Environmental Science	BSCNEPENSYCM	21-23

	B.Sc.	BSCNEPYCM	8. Food and Nutrition	BSCNEPFSNYCM	23-25
	B.Sc.	BSCNEPYCM	9. Geology	BSCNEPGEOYCM	25-29
	B.Sc.	BSCNEPYCM	10. Mathematics	BSCNEPMATYCM	30-34
	B.Sc.	BSCNEPYCM	11. Microbiology	BSCNEPMICYCM	34-35
	B.Sc.	BSCNEPYCM	12. Physics	BSCNEPPHYCM	36-36
	B.Sc.	BSCNEPYCM	13. Sericulture	BSCNEPSERYCM	37-38
	B.Sc.	BSCNEPYCM	14. Statistics	BSCNEPSTAYCM	39-42
	B.Sc.	BSCNEPYCM	15. Zoology	BSCNEPZOOYCM	42-45
2	BCA	BCANEPYCM	16. Computer Applications	BCANEPDAYCM	46-50
3	BBA	BBANEPYCM	17. Business Administration	BBANEPBAYCM	50-54
4	M.Sc. Integrated	MSCINTNEPYCM	18. Molecular Biology	MSCINTNEPMBYCM	55-58
Ability Enhancement Disciplines (AECC) Four have to be completed : Language disciplines: Compulsory (Two); One is English and the other can be chosen					
	B.Sc.	BSCNEPYCM	English This is included as one of the four ability Enhancement compulsory courses	BSCNEPENGYCM	58-59
AECC: MIL: Optional any one (out of eight )					
	B.Sc.	BSCNEPYCM	19. Kannada	BSCNEPKANYCM	59-63
	B.Sc.	BSCNEPYCM	20. Sanskrit	BSCNEPSANYCM	63-64
	B.Sc.	BSCNEPYCM	21. Hindi	BSCNEPHINYCM	64-64
	B.Sc.	BSCNEPYCM	Malayalam	BSCNEPMALYCM	---
	B.Sc.	BSCNEPYCM	Persian	BSCNEPPERBYCM	---
	B.Sc.	BSCNEPYCM	Tamil	BSCNEPTAMYCM	---

	B.Sc.	BSCNEPYCM	French,	BSCNEPFREYCM	---
	B.Sc.	BSCNEPYCM	Arabic	BSCNEPARAYCM	---
Compulsory two AECC					
	B.Sc.	BSCNEPYCM	22. Environmental Studies	BSCNEPESTYCM	.65-65
	B.Sc.	BSCNEPYCM	23. Digital Fluency	BSCNEPDIGYCM	65-66
	B.Sc.	BSCNEPYCM	24. Indian Constitution	BSCNEPICNYCM	66-69
Skill Enhancement Courses (SEC): any one has to be opted					
	B.Sc BBA BCA M.Sc	BSCNEPYCM BBANEPYCM BCANEPYCM MSCINTNEPYCM	25. Physical Education	BSCNEPPHEYCM BBANEPPEYCM BBANEPPEYCM MSCINTNEPMBYCM	69-70
	B.Sc.	BSCNEPYCM	Financial Literacy	---	---
	B.Sc.	BSCNEPYCM	Banking & Finance	---	---
	BBA	BBANEPYCM	Creativity and Innovation	---	---
	BCA	BCANEPYCM	Bachelor of Computer Application	---	---

**Bachelor of Science (Basic/Hons.) Degree in Biochemistry**  
**Choice Based Credit System (CBCS) With Multiple Entries**  
**And Exit Options under New Education Policy (NEP) – 2020**  
**(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	Discipline Core/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: Chemical Foundations of Biochemistry-1 (4+0+0)	4	4	40	60
	DSCP-1: Volumetric Analysis (0+0+2)	4	2	25	25
	OE-1: Biochemistry in Health and Diseases (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Chemical Foundations of Biochemistry-2 (4+0+0)	4	4	40	60
	DSCP-2: Qualitative and Quantitative Analysis (0+0+2)	4	2	25	25
	OE-2: Nutrition and Dietetics (3+0+0)	3	3	40	60

**Programme Outcome:**

- To create interest in Biochemistry and appreciation for chemical basis of biological processes.
- To inculcate the spirit of inquiry and value of systematic study of a discipline.
- Provide a general understanding of these related disciplines with holistic knowledge generation in biological sciences.
- To provide an in-depth understanding of chemical reaction mechanism in biological processes.

- To provide a flavor of historical developments of enzymes and their applications in research, diagnostics and various industries.
- Gain proficiency in basic laboratory techniques and be able to apply the scientific method to the processes of experimentation, hypothesis testing, data interpretation and logical conclusions.
- Develop problem solving and analytical skills through case studies, research papers and hands-on-experience

To appreciate biochemical mechanistic basis of physiological processes, metabolism under normal and pathological conditions importance and levels of metabolic regulations.

- To apply and effectively communicate scientific reasoning and data analysis in both written and oral forms. They will be able to communicate effectively with well-designed posters and slides intalks aimed at scientific audiences as well as the general public.
- To bridge the knowledge and skill gap between academic out and industry requirements.
- To give students experience inconducting independent, hypothesis-driven, biological research, project planning and management
- To provide skills to publish research findings, and awareness of IP rights, and scientific publication ethics and problems of plagiarism.
- To prepare competenthuman resource with better knowledge, hands-on-experience and scientific attitude, at national and global levels for career sin research and development, academia and Pharma-, biotech-and agro-, and food processing industries.

**Program Learning Outcome:** The learning outcome-based curriculum is specific in terms of changes incognitive and psychomotor behaviour of students. Biochemistry Honor scourse is intended to provide a broad framework enabling students to acquire a skill set that helps them understand and appreciate the field of biochemistry. The structure or design of this frameworks hall ensure a high standard of the Honors degree in Biochemistry at national level. The program specification is intended as a reference point for prospective students, current students, academic indelivering the program and realizing its objectives. Keeping in pace with the development altrends in Biochemistry and allied areas, itis expected that the students undertaking Biochemistry (Honors) course become conversant with the essence of Biochemistry and exhibit certain levels of learning outcomes as proposed below;

Graduates with strong academic knowledge, discipline-specific and generic skills complemented with social responsibility are greatest asset of the country. The curriculum frame work under NEP for Biochemistry graduates aims to build the following attributes;

## I SEMESTER

**Course Outcome:** This will inculcate confidence and clarity of mind in students to understand the chemistry of Biomolecules, and Biological reactions. Aptitude. Critical thinking. Subject clarity. Analytical Skill.

### Open Elective Course:

**OE-1: BIOCHEMISTRY IN HEALTH AND DISEASES (THEORY): 3 Credits 42 Hrs.**

**Course Outcome:** This open elective course offering to students of various streams gives knowledge about health and various terminologies used in health and disease conditions; Difference between communicable and non-communicable diseases; Health promotion and treatments for various diseases and disorders.

## II SEMESTER

**DSC-2: CHEMICAL FOUNDATIONS OF BIOCHEMISTRY-2 (THEORY):**

**4 Credits**

**56 Hrs.**

**Course Outcome:** These topics will enable students to understand the fundamentals of chemical processes in biological systems; Aptitude, Critical thinking, Subject clarity, Analytical Skill.

**DSCP-2: QUALITATIVE AND QUANTITATIVE ANALYSIS (PRACTICAL):**

**2 Credits**

**56 Hrs.**

**Course Outcome:** The Course Objective is to provide experimental practice of quantitative and qualitative analysis. Also it provide straining in physical chemistry laboratory techniques. Up on successful completion, students should develop skills in handling instruments and understand its application in research work.

### Open Elective Course:

**OE-2: NUTRITION AND DIETETICS (THEORY): 3 Credits 42 Hrs.**

**Course Outcome:** On completion of this course, the students will be able to;

- The student will gain knowledge about energy requirements and the Recommended Dietary Allowances.
- The student will understand the functions and role of macro nutrients, their requirements and the effect of deficiency and excess.
- The student learns the impact of various functional food so nour health.
- The student will be able to apply basic nutrition knowledge in making foods choices and obtaining an a dequate diet.
- The student gains competence in connecting the role of various nutrients in maintaining health and learn to enhance traditional recipes.

**Bachelor of Science (Basic/Hons.) Degree in Biotechnology**  
**Choice Based Credit System (CBCS) With Multiple Entries**  
**And Exit Options under New Education Policy (NEP) – 2020**  
**(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	Discipline Core/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: Cell Biology and Genetics (4+0+0)	4	4	40	60
	DSCP-1: Cell Biology and Genetics (0+0+2)	4	2	25	25
	OE-1: Biotechnology for human welfare (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Microbiological Methods and Techniques (4+0+0)	4	4	40	60
	DSCP-2: Microbiological Methods and Techniques (0+0+2)	4	2	25	25
	OE-2: Applications of Biotechnology in Agriculture (3+0+0)	3	3	40	60

**I SEMESTER**

**Programme outcome:**

Competencies need to be acquired by a candidate securing B.Sc. (Basic) or B.Sc. (Hons) degree in Biotechnology. At the end of the course the student should be able to:

- Demonstrating the Laboratory skills in cell biology, basic and applied microbiology with an emphasis on technological aspects.

- Understanding concepts of Biotechnology and demonstrate knowledge acquired in interdisciplinary skills in cell biology, genetics, biochemistry, microbiology, and molecular biology.
- Competent to apply the knowledge and skills gained in the fields of Plant biotechnology, animal biotechnology and microbial technology in pharma, food, agriculture, beverages, herbal and nutraceutical industries.
- Critically analyze the environmental issues and apply the biotechnology knowledge gained for conserving the environment and resolving the problems.
- Demonstrate comprehensive innovations and skills in the fields of biomolecules, cell and organelles, molecular biology, bioprocess engineering and genetic engineering of plants, microbes, and animals with respect to applications for human welfare.
- Apply knowledge and skills of immunology, bioinformatics, computational modelling of proteins, drug design and simulations to test the models and aid in drug discovery.
- Critically analyze, interpret data, and apply tools of bioinformatics and multi omics in various sectors of biotechnology including health and Food.
- Demonstrate communication skills, scientific writing, data collection and interpretation abilities in all the fields of biotechnology.
- Learning and practicing professional skills in handling microbes, animals and plants and demonstrate the ability to identify ethical issues related to recombinant DNA technology, genetic engineering, animals handling, intellectual property rights, biosafety, and biohazards.
- Exploring the biotechnological practices and demonstrating innovative thinking in addressing the current day and future challenges with respect to food, health, and environment.
- Thorough knowledge and application of good laboratory and good manufacturing practices in biotech industries.
- Understanding and application of molecular biology techniques and principles in for ensic and clinical biotechnology.
- Demonstrate entre preneur ship abilities, innovative thinking, planning, and setting up small-scale enterprises or CROs.

## II SEMESTER

**Programme outcome:** At the end of the course the student should be able to:

- Would be able to comprehend the structure of a cell with its organelles.
- Can explain the organization of genes and chromosomes, chromosome morphology and its aberrations.
- Can distinguish between the structure of prokaryotic and eukaryotic cell.



**Bachelor of Science (Basic/Hons.) Degree in Botany**  
**Choice Based Credit System (CBCS) With Multiple Entries**  
**And Exit Options under New Education Policy (NEP) – 2020**  
**(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	DisciplineCore/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
I	DSC-1: Microbial Diversity and Technology (4+0+0)	4	4	40	60
	DSCP-1: Microbial Diversity and Technology (0+0+2)	4	2	25	25
	OE-1: Plants and Human Welfare (3+0+0)	3	3	40	60
II	DSC-2: Diversity of Non- Flowering Plants (4+0+0)	4	4	40	60
	DSCP-2: Diversity of Non- Flowering Plants (0+0+2)	4	2	25	25
	OE-2: Plants and Human Welfare (3+0+0)	3	3	40	60

**I SEMESTER**

**Programme outcome:** At the end of the course the student should be able to:

- Understand the fascinating diversity, evolution, and significance of micro organisms.
- Comprehend the systematic position, structure, physiology and life cycles of microbes and their impact on humans and environment.
- Gain laboratory skills such as microscopy, microbial cultures, staining, identification, preservation of microbes for their applications in research and industry.

**Open Elective Course:**

**OE-1: PLANTS AND HUMAN WELFARE (THEORY):**                      **3 Credits    42 Hrs.**

**Course Outcome:**

On completion of this course, the students will be able to;

- To make the students familiar with economic importance of diverse plants that offer resources to human life.
- To make the students known about the plants used as-food, medicinal value and also plant source of different economic value.
- To generate interest amongst the students on plants importance in day today life, conservation, eco system and sustainability.

## II SEMESTER

**Programme outcome:** At the end of the course the student should be able to:

- Understand the diversity and affinities among Algae, Bryophytes, Pteridophytes and Gymnosperms.
- Understand the morphology, anatomy, reproduction and life cycle across Algae, Bryophytes, Pteridophytes and Gymnosperms, and their ecological and evolutionary significance.
- Obtain laboratory skills/explore non-flowering plants for their commercial applications.

### Open Elective Course:

#### OE-2: PLANT PROPAGATION, NURSERY MANAGEMENT AND GARDENING

(THEORY):

3 Credits

42 Hrs.

**Course Outcome:** On completion of this course, the students will be able to;

- To gain knowledge of gardening, cultivation, multiplication, raising of seedlings of garden plants.
- To get knowledge of new and modern techniques of plant propagation.
- To develop interest in nature and plant life.

## Bachelor of Science (Basic/Hons.) Degree in Chemistry

### Choice Based Credit System (CBCS) With Multiple Entries

### And Exit Options under New Education Policy (NEP) – 2020

### (2021-22 Batch Onwards)

#### Details of Course of Study: I and II Semesters

Sem.	Discipline Core/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: Chemistry-1 (4+0+0)	4	4	40	60

	DSCP-1: Chemistry-1 Practical (0+0+2)	4	2	25	25
	OE-1: Chemistry In Daily Life (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Chemistry-2 (4+0+0)	4	4	40	60
	DSCP-2: Chemistry-2 Practical (0+0+2)	4	2	25	25
	OE-2: Molecules of Life (3+0+0)	3	3	40	60

**Program Outcomes:** By the end of the program the students will be able to:

- To create enthusiasm among students for chemistry and its application in various fields of life.
- To provide students with broad and balanced knowledge and understanding of key concepts in chemistry
- To develop in students a range of practical skills so that they can understand and assess risks and work safely measures to be followed in the laboratory.
- To develop in students the ability to apply standard methodology to the solution of problems in chemistry
- To provide students with knowledge and skill towards employment or higher education in Analytical chemistry or multi-disciplinary areas involving chemistry.
- To provide students with the ability to plan and carryout experiments independently and assess the significance of outcomes and to cater to the demands of chemical Industries of well-trained graduates
- To develop in students the ability to adapt and apply methodology to the solution of unfamiliar types of problems.
- To instill critical awareness of advances at the forefront of chemical sciences, to prepare students effectively for professional employment or research degrees in chemical sciences and to develop an independent and responsible work ethics.

**Learning/Course Outcomes:**

After studying this course student will be able to understand:

- The concepts of chemical analysis, accuracy, precision and statistical data treatment.
- Prepare the solutions after calculating the required quantity of salts in preparing the reagents/solutions and dilution of stock solution.
- Describe the dual nature of radiation and matter; dual behavior of matter and radiation, deBroglie's equations, He is enberg uncertain typrinciple and their related problems.

- Quantum mechanics. Derivation of Schrodinger's wave equation. Radial and angular Orbital shapes of s,p,d and fatomicorbitals, nodalplanes. Electronic configurations of the atoms.
- Pauli's exclusion principle, Hund's rule, Aufbau's principle and its limitation.
- The concepts of Organic reactions and techniques of writing the movement of electrons, bond breaking, bond forming.
- The Concept of aromaticity, resonance, hyper conjugation, etc.
- Explain bond properties , electron displacement effects (inductive effect, electro metric effect, resonance effect and Hyper conjugation effect). steric effect and their applications inexplaining acidic trength of carboxylic acids, sbasicity of amines.
- Understand basic concept of organic reaction mechanism, types of organic reactions.
- Understand the preparation and reactions of alkanes.
- Understand the stability and conformational analysis of cycloalkanes.
- Understand the concept of resonance, aromaticity and anti-aromaticity.
- Describe relative strength of aliphatic and aromatic carboxylic acids.
- Explain the existence of different states of matter interm so balance between inter molecular forces and thermal energy of the particles. Explain the laws governing behavior of ideal gases and real gases. Understand cooling effect of gas on a diabatic expansion.
- Understand the conditions required for liquefaction of gases. Realize that there is continuity in gaseous and liquids state.
- Understand the properties of liquids interms of inter molecular attractions.
- Understand the existence of different states of matter interm so balance between intermolecular forces and thermal energy of the particles. Explain the laws governing behavior of ideal gasesandrealgases. Understand cooling effect of gas on adiabatic expansion.
- Understand the conditions required for liquefaction of gases. Realizeth at the reiscontinuity in gaseous and liquid state.
- Understand the properties of liquids interms of intermoleculars attractions.

**DSCP-1:CHEMISTRY-1 (PRACTICALS): 4 Credits;**

**56 Hrs.**

**Learning/Course Outcomes:** After studying this course and performing the experiments setinit, student willbe able to understand:

- Basic concepts involved intitrimetric analysis, primary standard substances, preparation of standard solutions.

- Explain the principles of acid-base, redox and iodometric titrations.
- Work out the stoichiometry relations based on the reactions involved in the titrimetric analysis.
- Describe the significance of organic quantitative analysis.
- Understand the preparation of organic compounds involving addition, substitution, hydrolysis, diazotization and condensation reactions.

### **Open Elective Course (OE)**

**OE-1: CHEMISTRY IN DAILY LIFE:            3 Credits;            42 Hrs.**

**Learning/Course Outcomes:** On completion of the course students will be able to:

- Understand the chemical constituents in various day to day materials using by a common man.
- Understand the chemical constituents in vitamins, soaps and detergents.
- Understand the renewable chemical energy resources.
- Understand different types of polymers and their applications.

### **II SEMESTER**

**Learning/Course Outcomes:** After studying this course student will be able to:

- Understand principles of titrimetric analysis.
- Understand principles of different type's titrations. Titration curves for all types of acid-base titrations.
- Gain knowledge about balancing redox equations, titration curves, theory of redox indicators and applications.
- Understand titration curves, indicators for precipitation titration involving silver nitrate-Volhard's and Mohr's methods and their differences.
- Indicators for EDTA titrations - theory of metal ion indicators. Determination of hardness of water.
- Understand periodic table, classification and properties of s, p and f block elements.
- Understand different scales for the measurement of electro-negativity and factors affecting it.
- Understand chemistry of the hydrides, carbides, oxides and halides of group 13-17.
- Understand nucleophilic substitution at saturated carbon, energy profile diagram.
- Stereo chemistry and factors affecting SN1 and SN2 reactions.

- Aromatic electrophilic substitution reactions; nitration, sulfonation Friedel-Crafts.
- Understand liquid crystals, classification with examples.
- Understand the different forms of solids, laws of crystallography, miller indices and its calculation, X-ray diffraction studies. Bragg's law and its equation.
- Defects in solids, properties of glasses and concept of liquid crystals.

**DSCP-2:CHEMISTRY-2 (PRACTICALS): 4 Credits; 56 Hrs.**

**Learning/Course Outcomes:** After studying this course and performing the experiments set out, student will be able to understand:

- Basic concepts involved in titrimetric analysis, primary standard substances, preparation of standard solutions.
- Explain the principles of acid-base, redox and iodometric titrations.
- Describe the significance of inorganic quantitative analysis.
- Determine density followed by the determination of viscosity and surface tension of different liquid samples.
- Determination of partition coefficient of different liquid mixtures.
- Determination of rate constant in the decomposition reaction of hydrogen peroxide.

### Open Elective Course (OE)

**OE-2: MOLECULES OF LIFE 3 Credits; 42 hrs.**

**Course/Learning Outcomes:** On completion of the course students will be able to:

- Acquire knowledge about different types of sugars and their chemical structures.
- Identify different types of amino acids and determine the structure of peptides.
- Explain the actions of enzymes in our body and interpret enzyme inhibition.
- Predict action of drugs. Depict the biological importance of oils and fats. Importance of lipids in the metabolism. Differentiate RNA and DNA and their replication. Explain production of energy in our body.

## **Bachelor of Science (Basic/Hons.) Degree in Computer Science**

**Choice Based Credit System (CBCS) With Multiple Entries  
And Exit Options under New Education Policy (NEP) – 2020  
(2021-22 Batch Onwards)**

### Details of Course of Study: I and II Semesters

Sem.	DisciplineCore/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
I	DSC-1: Computer Fundamentals and Programming in C (4+0+0)	4	4	40	60
	DSCP-1: C Programming (0+0+2)	4	2	25	25
	OE-1: Office Automation (3+0+0)	3	3	40	60
II	DSC-2: Data Structures using C (4+0+0)	4	4	40	60
	DSCP-2: Data structures (0+0+2)	4	2	25	25
	OE-2: C Programming Concepts (3+0+0)	3	3	40	60

**Course objectives:** The present Curriculum Framework for BSc degrees is intended to facilitate the students to achieve the following.

- To build up an indulgent and knowledge of the basic theory of Computer Science and Information Technology with good basis on theory, systems and applications such as algorithms, data structures, data handling, data communication, computation and analysis.
- To develop the capability to use this knowledge to analyse new situations in the application domain including software tiny tools.
- To gain indispensable and state-of-the-art skills to take up industry challenges. The objectives and outcomes are carefully designed to suit to the above-mentioned purpose.
- The ability to synthesize the acquired knowledge, understanding and experience for a better and improved comprehension of the real-life problems.
- To learn skills and tools like mathematics, statistics and electronics to find the solution, interpret the results and make predictions for the future developments.
- To formulate, to model, to design solutions, procedure and to use software tools to solve real world problems and evaluate.

**Programme Outcomes:** The Bachelor of Computer Science (Basic/Hons) program makes possible students to accomplish following additional attributes besides the afore-mentioned attributes, by the time of graduation:

- ❖ The ability to apply skill set in computing with strong programming and mathematics skills, as well as wide ranging skills in project management, effective presentations and team work.

- ❖ Run by contemporary trends in industrial/research settings and there by innovate novel solutions to existing problems.
- ❖ The capability to apply the knowledge and understanding noted skills to the analysis of a given information handling problems.
- ❖ The skill to work independently on a generous software project and as an effective team member.
- ❖ Discipline knowledge: Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity.
- ❖ Problem Solving: Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
- ❖ Programming a computer: Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.
- ❖ Application Systems Knowledge: Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.
- ❖ Communication: Must have a reasonably good communication knowledge both in oral and writing.
- ❖ Ethics on Profession, Environment and Society: Exhibiting professional ethics to maintain the internality in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
- ❖ Lifelong Learning: Should become an independent learner. So, learn to learn ability.
- ❖ Motivation to take up Higher Studies: Inspiration to continue educations towards advanced studies on Computer Science.

## I SEMESTER

**Course Outcomes:**After completing this course satisfactorily, a student will be able to:

- Confidently operate Desktop Computers to carry out computational tasks.
- Understand working of Hardware and Software and the importance of operating systems.
- Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts.
- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given problem.
- Perform input and output operations using programs in C.
- Write programs that perform operations on arrays.



## II SEMESTER

**Course Outcomes:**After completing this course satisfactorily, a student will be able to:

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs.
- Demonstrate different methods for traversing trees.
- Compare alternative implementations of data structures with respect to performance.
- Describe the concept of recursion, give examples of its use.
- Discuss the computational efficiency of the principal algorithms for sorting and searching.

### Open Elective Course (OE)

**Course Outcomes:**

- ❖ Confidently operate Desktop Computers to carry out computational tasks.
- ❖ Understand working of Hardware and Software and the importance of operating systems.
- ❖ Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts
- ❖ Read, understand and trace the execution of programs written in C language.
- ❖ Write the C code for a given problem.
- ❖ Perform input and output operations using programs in C.
- ❖ Write programs that perform operations on arrays.

## Bachelor of Science (Basic/Hons.) Degree in Electronics

**Choice Based Credit System (CBCS) With Multiple Entries  
And Exit Options under New Education Policy (NEP) – 2020  
(2021-22 Batch Onwards)**

### BOARD OF STUDIES: PROCEEDINGS

#### Details of Course of Study: I and II Semesters

Sem.	Discipline Core/ Open Elective Paper	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
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	(L+T+P)				
<b>I</b>	DSC-1: Electronic Devices and Circuits (4+0+0)	4	4	40	60
	DSCP-1: Electronic Devices and Circuits (0+0+2)	4	2	25	25
	OE-1: Fundamentals of Electronics and Domestic Wiring (3+0+0)	3	3	40	60
	OE-2: Domestic Equipment Maintenance (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Analog and Digital Electronics (4+0+0)	4	4	40	60
	DSCP-2: Analog and Digital Electronics (0+0+2)	4	2	25	25
	OE-3: Fundamentals of Semiconductor Devices (3+0+0)	3	3	40	60
	OE-4: Renewable Energy and Energy Harvesting (3+0+0)	3	3	40	60
	OE-5: PCB Design and Fabrication (3+0+0)	3	3	40	60

## I SEMESTER

### Course objectives:

The objectives of the Course are to enable the student to understand Principle of operation of passive components.

- Basics principles of network theorems.
- Analysis of Electronic circuits Construction, operation and applications of semi conductor diode, BJT and special purpose devices
- Number systems, Boolean laws and methods of simplifications of Boolean expressions
- Course Outcomes at the end of this course, students will be able to explain the principles and behavior of basic semi conductor devices.
- Analyse basic networks using network theorems.
- Apply the concepts to realize the circuits. As per the requirement build simple electronic circuits used in various applications.
- Evaluate the critical internal parameters of semi conductor devices for the given standard device models. Demonstrate the working of analog and digital circuits as per the specifications.

**DSCP-1: ELECTRONIC DEVICES AND CIRCUITS (PRACTICALS): 4 Credits 56 Hrs.**

**Course Objectives:** The objectives of the Course are to enable the student get the hands-on training on the Working principles of Electronics Instruments and components.

- ❖ Analyse Electronic circuits by applying Network theorems
- ❖ Understand the I-V characteristics of Diode, BJT, and other semi conductor devices
- ❖ Design and construct the biasing, amplifier, resonant circuits and to understand their behaviour.
- ❖ Simplify Boolean Expressions and construct the circuits to verify the truth table.

**Open Elective Courses (OE)****OE-1: FUNDAMENTALS OF ELECTRONICS AND DOMESTIC WIRING:****3 Credits****48 Hrs.**

**Course Objectives:** The objectives of the Course are to enable the student to understand

- Ability to gain the knowledge of basic electronics and electronic components.
- Ability to analyse various components behaviour in AC and DC circuits.
- Ability to get the knowledge of electrical wiring and safety precautions.
- Provide students with learning experiences that develop broad knowledge and understanding of key concepts of electrical and electronics.
- Provide students with skills that enable them to get employment in various organisations, industries, and turn as entrepreneurs.

**OE-2: DOMESTIC EQUIPMENT MAINTENANCE: 3 Credits 48 Hrs.**

**Course Objectives:** The objectives of the course are

- To enable the students to understand the working principle of domestic equipments.
- Identify the common faults that occurs in the domestic equipment.
- Able to carry out minor repairs in the equipments.
- Understand the technical specifications of the equipments.

**II SEMESTER**

**Course objectives:** The objectives of the Course are to enable the student to understand Principle of operation active devices like, BJT, FET, Op-Amp, UJT, SCR, etc., Understand different applications of op-amp.

- Analysis of Electronic circuits.
- Construction, operation and applications oscillators.

- Digital Logic Families and their comparison.
- Understand, analyse and simply combinational and sequential digital logic circuits.
- Course Outcomes At the end of this course, students will be able to explain the working principles of semiconductor devices like JFET, MOSFET, UJT, SCR, Diac and Triac.
- Design and build the circuits to understand the applications of op-amp.
- Demonstrate and understand the working of combinational and sequential logic circuits.

### **DSCP-1: ELECTRONIC DEVICES AND CIRCUITS (PRACTICALS): 4 Credits 56 Hrs.**

**Course Objectives:** The objectives of the Course are to enable the students to have hands on training and understanding of the following I-V characteristics of special devices like Principle of operation active devices like, BJT, FET, Op-Amp, UTJ, SCR, etc.,

- ❖ Understand different applications of op-amp,
- ❖ Know about the working of sinusoidal and non-sinusoidal oscillators.
- ❖ Working of Combinational and Sequential Digital circuits.
- ❖ Understand the concept and working of ADC and DAC

## **Open Elective Courses (OE)**

### **OE-3: FUNDAMENTALS OF SEMICONDUCTOR DEVICES: 3 Credits 48 Hrs.**

**Course Objectives:** The objectives of the Course are to enable the student to understand

- Ability to gain the knowledge of Semi conductor devices.
- Ability to get the applications of semi conductor devices.
- Provide students with learning experiences that develop broad knowledge and understanding of semi conductor devices and its applications.

**Course Objectives:** The objectives of the course are

- To enable the students to understand the importance of non-conventional energy systems
- Understand the method of energy harvesting using solar energy, wind energy, hydro energy, etc.
- Know the principle of operation of piezoelectric effect and its use in energy harvesting
- Get the knowledge on electromagnetic energy harvesting methods.

**OE-5: PCB DESIGN AND FABRICATION: 3 Credits 48 Hrs.**

**Course Objectives:** Upon the completion of this course, students will demonstrate the ability to:

- Understand basics of PCB designing.
- Apply advance techniques, skills and modern tools for designing and fabrication of PCBs.
- Apply the knowledge and techniques to fabricate Multilayer, SMT and HDIPCB.
- Understand concepts of Packaging.

## **Bachelor of Science (Basic/Hons.) Degree in Environmental Science**

### **Choice Based Credit System (CBCS) With Multiple Entries And Exit Options under New Education Policy (NEP) – 2020 (2021-22 Batch Onwards)**

#### **Details of Course of Study: I and II Semesters**

<b>Sem.</b>	<b>DisciplineCore/ Open Elective Paper (L+T+P)</b>	<b>Teaching hours/ week</b>	<b>Credits</b>	<b>Internal Assessment Marks (C1 + C2)</b>	<b>Semester End Examination Marks (C3)</b>
<b>I</b>	DSC-1: Divisions of Environment (4+0+0)	4	4	40	60
	DSCP-1: Water quality analysis (0+0+2)	4	2	25	25
	OE-1: Environmental Conservation Movements (3+0+0)	3	3	40	60
	OE-2: Environment and Sustainable Agriculture (3+0+0)	3	3	40	60
	OE-3: Environmental Pollution (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Ecology–Theory and Practice (4+0+0)	4	4	40	60
	DSCP-2: Ecological analysis (0+0+2)	4	2	25	25
	OE-4: Climate Change and Its Implications (3+0+0)	3	3	40	60
	OE-5: Environment and Public Healthin Contemporary	3	3	40	60

	Society (3+0+0)				
	OE-6: Wildlife and Conservation (3+0+0)	3	3	40	60

**Programme outcome:** By the end of the Programme the students will be able to develop:

- Disciplinary knowledge in fields related to Environmental Science
- Systemic and critical thinking with reference to environment-people-economic-development attributes
- Problem identification skills and sustainable solution provisioning
- Analytical reasoning and appropriate interpretation skills
- Self-directed learning efficiencies leading to a productive lifelong learning process
- Research-related skills such as review of literature, design of experiments, statistical competence, report writing and prepare target specific communication packages
- Cooperation/Teamwork
- Reflective thinking
- Multi disciplinary competence catering to environmental sustainability

## I SEMESTER

### Programme Specific Objectives:

- To develop competency in understanding the inter relatedness of the divisions of the Environment.
- To instill an introductory knowledge of the divisions of Environment and develop necessary analytical skills to characterise the variations.
- To motivate and inspire to acquire contemporary understanding and skills leading to issue identification.
- To inculcate creativity and innovative spirit in the domain of human-environment interface leading to vocation/entrepreneurial opportunities.

### Programme outcomes:

- ❖ Demonstrate an entry level competence in understanding the environmental divisions and associated processes.
- ❖ Demonstrate the ability to carry out water quality analysis in the laboratory and interpret the results.
- ❖ Ability to understand and appreciate the role of environmental parameters in specific day-to-day activities.
- ❖ Be able to understand the demands and function in work environment dealing with environmental systems.

## II SEMESTER

### Programme Specific Objectives:

- To develop competency in understanding the ecological principles governing the biosphere.
- To instill a knowledge of the Ecology and develop necessary analytical skills to understand the ecological systems.
- To motivate and inspire to acquire contemporary understanding and skills leading to issue identification.
- To inculcate creativity and innovative spirit in the domain of human-environment interface leading to vocation/entrepreneurial opportunities

### Programme outcomes:

- ❖ Demonstrate an entry level competence in understanding the ecological dynamics and their influence on humans and anthropogenic endeavours.
- ❖ Demonstrate the ability to carry out ecological analysis in field conditions/laboratories and make appropriate judgements.
- ❖ Ability to understand and appreciate the role of ecology and system dynamics in specific habitats/agroeco systems.
- ❖ Be able to understand the demands and function in work environment dealing with environmental systems.

### **Bachelor of Science (Basic/Hons.) Degree in Food Science & Nutrition**

### **Choice Based Credit System (CBCS) With Multiple Entries And Exit Options under New Education Policy (NEP) – 2020 (2021-22 Batch Onwards)**

#### **Details of Course of Study: I and II Semesters**

Sem.	Discipline Core/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: Human Physiology (4+0+0)	4	4	40	60
	DSCP-1: Human Physiology (0+0+2)	4	2	25	25
	OE-1: Basics of Food Science (3+0+0)	3	3	40	60

	OE-2: Basics of Nutrition (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Fundamentals of Human Nutrition (4+0+0)	4	4	40	60
	DSCP-2: Fundamentals of Human Nutrition (0+0+2)	4	2	25	25
	OE-3: Healthy Lifestyle (3+0+0)	3	3	40	60
	OE-4: Culinary Science (3+0+0)	3	3	40	60

## I SEMESTER

**Course Outcomes:** At the end of the course the student should be able to:

- Gain the basic knowledge of human anatomy and physiology.
- Define the main structures composing human body.
- Explains structure and functions of cells, tissues and organs, systems of the human body
- Relates structure and functions of tissue.
- Provides excellent preparation for careers in the health professions and/or biomedical research.

### Open Elective Course (OE):

**OE-1: BASICS OF FOOD SCIENCE(THEORY): 3 Credits 42 Hrs.**

#### Objectives:

- Its scope is to help and gain knowledge on Food groups and food commodities,
- To Understand the nutritional composition of foods

#### Learning Outcomes:

- ❖ It helps to know different types of food commodities and their importance.
- ❖ To learn the macro and micronutrients content of food commodities.

**OE-2: BASICS OF NUTRITION(THEORY): 3 Credits 42 Hrs.**

#### Objectives:

- Its scope is to help and gain knowledge of Nutrients.

#### Learning Outcomes:

- ❖ It helps to know about the use of different nutrients and their functions.

**DSC-2: FUNDAMENTALS OF HUMAN NUTRITION (THEORY): 4 Credits; 56 Hrs.**



**Course Outcome:**

- Gain knowledge in basic terminology, aspects of nutrition & functions of food in healthy life sustenance
- Understand function of nutrients, dietary sources, consequences of deficiency and excess
- Understand the food composition and concept of energy balance
- Equip with knowledge and understanding on importance of water
- Understand the nutritional management of deficiency disorders.

**Open Elective Course (OE):**

**OE-3: HEALTHY LIFE STYLE (THEORY):                    3 Credit;        42 Hrs.**

**Course Outcome:** On completion of this course, the students will be able to;

- Gain knowledge on healthy life styles.
- Understand the relationship between different nutrients and their importance.
- Understand the personal hygiene; environmental Hygiene.

**OE-4: CULINARY SCIENCE (THEORY):                    3 Credit;        42 Hrs.**

**Course Outcome:** On completion of this course, the students will be able to;

- Gain knowledge on aims and objectives of cooking.
- Understand the Conservation of nutrients and their importance to life.
- Understand the personal hygiene; environmental Hygiene; food storage and causes of contamination.

**Bachelor of Science (Basic/Hons.) Degree in Earth Science  
(Geology)**

**Choice Based Credit System (CBCS) With Multiple Entries  
And Exit Options under New Education Policy (NEP) – 2020  
(2021-22 Batch Onwards)**

**Program Outcomes:** Discipline knowledge: After the completion of the BSc Course (Degree/Honors), the students will be learning the basics and important aspects of all branches of Earth Sciences mentioned in the preamble; which will enable them to apply their acquired knowledge.

1. Problem Solving: After going through 6 or 8 semesters curricula the students will be able to understand and decipher majority of the geological processes and their effects.
2. Ethics on Profession, Environment and Society: As the subject Geology is

related to Earth its resources and processes the students will be taught to acquire ethics to maintain the integrity while dealing with data collection, compilation, and interpretation and finding solutions.

3. Lifelong Learning and Entrepreneurship: Geology is regarded as a technical subject one can start their own consultancy so, they will become an independent entrepreneur and hence learning will be lifelong.
4. Motivation to take up Higher Studies: Inspiration to continue towards advanced studies in Geology and sResearch.

**Open Elective (OE) Courses:** OE courses are offered to the candidates of either the same program or other undergraduate programs as decided by the competent authority of the University of Mysore and the candidate who opts for OE in Earth Science has to choose one OE from the pool in each semester. The OE courses, in addition to enhancing the knowledge on the Earth's processes and helps to acquire skills for entrepreneurship.

Concept note, abbreviation explanation, coding, eligibility for admission to the course, duration of the course, course pattern, medium of instruction, attendance, internal assessment, mode of examination, duration of examination, results of the candidates and carry over are as per the provision made in the NEP regulations of University of Mysore and Yuvaraja's College (autonomous).

### Details of Course of Study: I and II Semesters

Sem.	DisciplineCore/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: Earth System Science - Fundamentals (4+0+0)	4	4	40	60
	DSCP-1: Maps, Sediment Soil, Field Visit (0+0+2)	4	2	25	25
	OE-1: Crystallography, Mineralogy and Economic Mineral (3+0+0)	3	3	40	60
	OE-2: Pedology (3+0+0)	3	3	40	60
	OE-3: Basics of Earth System Science (3+0+0)	3	3	40	60
	OE-4: Geohazards and Mitigation Strategies (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Basics of Crystallography, Minerology and Petrology (4+0+0)	4	4	40	60

DSCP-2: Crystallography, Mineralogy and Petrology (0+0+2)	4	2	25	25
OE-5: Medical Geology (3+0+0)	3	3	40	60
OE-6: Industrial Minerals (3+0+0)	3	3	40	60
OE-7: Paleobiology (3+0+0)	3	3	40	60
OE-8: Gems and Ornamental Stones (3+0+0)	3	3	40	60

## I SEMESTER

**DSC-1: EARTH SYSTEM SCIENCE – FUNDAMENTALS (THEORY): 4 Credit; 56 Hrs.**

**Course Outcomes:** At the end of the course the student should be able to:

1. Explain the origin and internal structure of the Earth.
2. Explain the conceptual and dynamic aspects of land form development.
3. Learn the relevance of applied aspects of Geomorphology in various fields.
4. Formulate conceptual and analytical descriptions of geodynamic processes such as volcanism, earthquake and formation of ocean.

**DSCP-1: MAPS, SOIL & FIELD VISIT (PRACTICAL): 2 Credits 56 Hrs.**

**Course Outcome:**

- Students learn the preparation of various kinds of maps.
- Students learn the skill of detecting the changes in the land use/land cover of a region and study its impacts, suggest remedial measures.
- Students get acquainted with the soil properties, types, characteristics and remediation of soil.

### Open Elective Course (OE):

**OE-1: CRYSTALLOGRAPHY, MINERALOGY AND ECONOMIC MINERAL(THEORY):**

**3 Credits**

**42 Hrs.**

**Course Outcome:**

- Studying the basics of mineralogy and crystallography helps in understanding and building the overall knowledge in Geology.
- The students will be able to identify common rock-forming minerals and hand specimens as well as in thin sections.
- The students get familiarized with the instruments used to analyse

inorganic compounds.

**OE-2: PEDOLOGY (THEORY): 3 Credits 42 Hrs.**

**Course Outcome:** The students will be able to learn the processes of formation of soil, its classification, texture and structure, soil characteristics of each textural and structural class.

**OE-3: BASICS OF EARTH SYSTEM SCIENCE (THEORY): 3 Credits 42 Hrs.**

**Course Outcome:** At the end of the course the student should be able to:

- ❖ Explain the origin and internal structure of the Earth.
- ❖ Explain the conceptual and dynamic aspects of land form development.
- ❖ Learn the relevance of applied aspects of Geomorphology in various fields.

**OE-4: GEOHAZARDS AND MITIGATION STRATEGIES (THEORY):**

**3 Credits 42 Hrs.**

**Course Outcome:** After completing the course, student

- ❖ Can understand the geology behind natural disasters.
- ❖ Will understand the origin and occurrence of geohazards and evaluate the prediction and mitigations.
- ❖ Can understand the causes, threats, impact, magnitude and intensity of the natural hazards.
- ❖ Will be able to qualitatively estimate risk, and envisage risk-appropriate mitigation strategies.

## II SEMESTER

**DSC-2: BASICS OF CRYSTALLOGRAPHY, MINERALOGY AND PETROLOGY (THEORY):**

**4 Credits 56 Hrs.**

**Course Outcome:** At the end of the course the student should be able to:

- ❖ To understand the states of matter, atomic arrangement in crystals, and classification of crystals based on crystal symmetry.
- ❖ To understand the characteristics of common rock-forming minerals.
- ❖ To acquire knowledge on different types of rocks, their distinction from each other and the rock cycle.
- ❖ To understand the occurrence and distribution of rocks in India.

**DSCP-2: CRYSTALLOGRAPHY, MINERALOGY AND PETROLOGY (PRACTICAL):**

**2 Credits 56 Hrs.**

**Course Outcome:** At the end of the course the student should be able to:

- ❖ To understand the states of matter, atomic arrangement in crystals, and classification of crystals based on crystal symmetry
- ❖ To understand the characteristics of common rock-forming minerals
- ❖ To acquire knowledge on different types of rocks, their distinction from each other and the rockcycle.
- ❖ To understand the occurrence and distribution of rocks in India.

### **Open Elective Course (OE):**

**OE-5: MEDICAL GEOLOGY(THEORY):                      3 Credits      42 Hrs.**

**Course Outcome:** The course provides a basic understanding of geogenic and anthropogenic distribution of trace elements, its cyclic movement through the abiotic-biotic environment and their toxic effects on human health and that of flora and fauna.

**OE-6: INDUSTRIAL MINERALS(THEORY):                      3 Credits      42 Hrs.**

**Course Outcome:** This course is a good opportunity for most of science and social science students not only to know about the mineral resources of India starting the principles of rock formation including minerals genesis during the rock formation and after their formation.

- Students exit with a certificate course will have skills to work in quarrying, mining, rock polishing, cement, silica/glass, sand mining, brick, ceramic, pottery and refractory industries.
- They will be exposed to start their own entrepreneurship. Similarly, students exit with a diploma, to Honors degree will be benefited work/carryout research in the interdisciplinary science to get original ideas and look for new reserves.

**OE-7: PALEOBIOLOGY (THEORY):                      3 Credits      42 Hrs.**

**Course Outcome:** At the end of the course, students understand the types of invertebrate fossils, their mode of preservation, examination of the fossils, methodologies for the reconstruction of the past through evolutionary studies.

**OE-8: GEMS AND ORNAMENTAL STONES (THEORY):                      3 Credits      42 Hrs.**

**Course Outcome:** At the end of the course the student should be able to:

- To understand mineralogy and genesis of gem stones.
- To identify main physical and optical techniques used in the gems characterisation.

**Bachelor of Science (Basic/Hons.) Degree in Mathematics**  
**Choice Based Credit System (CBCS) With Multiple Entries**  
**And Exit Options under New Education Policy (NEP) – 2020**  
**(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	DisciplineCore/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: Algebra-I and Calculus-I (4+0+0)	4	4	40	60
	DSCP-1: Theory based Practical's on Algebra-I and Calculus-I (0+0+2)	4	2	25	25
	OE-1: Optional Mathematics-I (3+0+0)	3	3	40	60
	OE-2: Business Mathematics-I (3+0+0)	3	3	40	60
	OE-3: Mathematical Aptitude-I (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Algebra-II(Number Theory) and Calculus-II (4+0+0)	4	4	40	60
	DSCP-2: Theory based Practical's on Algebra- II(Number Theory) and Calculus-II (0+0+2)	4	2	25	25
	OE-5: Optional Mathematics-II (3+0+0)	3	3	40	60
	OE-6: Business Mathematics- II(3+0+0)	3	3	40	60
	OE-7: Mathematical Aptitude-II(3+0+0)	3	3	40	60

**Programme outcome:** The student graduating with the Mathematics should be able to

- ❖ **Disciplinary Knowledge:** Bachelor degree in Mathematics is the culmination of in-depth knowledge of Algebra, Calculus, Geometry, differential equations and several other branches of pure and applied mathematics. This also leads to study the related areas such as computer science and other allied subjects.
- ❖ **Communication Skills:** Ability to communicate various mathematical concepts effectively using examples and their geometrical visualization. The skills and knowledge gained in this program will lead to the proficiency in

analytical reasoning which can be used for modeling and solving of real life problems.

- ❖ **Critical thinking and analytical reasoning:** The students undergoing this programme acquire ability of critical thinking and logical reasoning and capability of recognizing and distinguishing the various aspects of real life problems.
- ❖ **Problem Solving:** The Mathematical knowledge gained by the students through this programme develop ability to analyze the problems, identify and define appropriate computing requirements for its solutions. This programme enhances student's overall development and also equip them with mathematical modelling ability, problem solving skills.
- ❖ **Research related skills:** The completing this programme develop the capability of inquiring about appropriate questions relating to the Mathematical concepts in different areas of Mathematics.
- ❖ **Information/digital Literacy:** The completion of this programme will enable the learner to use appropriate softwares to solve system of algebraic equation and differential equations.
- ❖ **Self-directed learning:** The student completing this program will develop an ability of working independently and to make an in-depth study of various notions of Mathematics.
- ❖ **Moral and ethical awareness/reasoning:** : The student completing this program will develop an ability to identify unethical behavior such as fabrication, falsification or misinterpretation of data and adopting objectives, unbiased and truthful actions in all aspects of life in general and Mathematical studies in particular.
- ❖ **Lifelong learning:** This programme provides self-directed learning and lifelong learning skills. This programme helps the learner to think independently and develop algorithms and computational skills for solving real word problems.
- ❖ Ability to pursue advanced studies and research in pure and applied Mathematical sciences.

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## I SEMESTER

**Course Outcomes:** This course will enable the students to:

- ❖ Learn to solve system of linear equations.
- ❖ Solve the system of homogeneous and non-homogeneous linear of  $m$  equations in  $n$  variable by using concept of rank of matrix.
- ❖ Students will be familiar with the techniques of integration and differentiation of function with real variables.

- ❖ Students learn to solve polynomial equations.
- ❖ Learn to apply Reduction formulae.
- ❖ Learn *Free and Open Source Software (FOSS)* tools for computer programming.
- ❖ Solve problem on algebra and calculus theory studied in MATDSCT1.1 by using FOSS software's.
- ❖ Acquire knowledge of applications of algebra and calculus through FOSS.

### **Open Elective Course (OE):**

**OE-1: OPTIONAL MATHEMATICS-I (THEORY):            3 Credits    42 Hrs.**

**Course Learning Outcome:** This course will enable the students to;

- ❖ Learn to solve system of linear equations.
- ❖ Solve the system of homogeneous and non-homogeneous linear equations by using the concept of rank of matrix.
- ❖ Students will be familiar with the techniques of differentiation of function with real variables.
- ❖ Identify and apply the intermediate value theorem and L'Hospital rule. Learn to apply Reduction formulae.

**OE-2: BUSINESS MATHEMATICS-I (THEORY): 3 Credits            42 Hrs.**

**Course Learning Outcome:** This course will enable the students to;

- ❖ Translate real world problems through appropriate mathematical modelling.
- ❖ Explain the concepts and use equations, formulae and mathematical expression and relationship in a variety of context.
- ❖ Finding the extreme values of functions.
- ❖ Analyze and demonstrate the mathematical skill require in mathematically intensive areas in economics and business.

**OE-3: MATHEMATICAL APTITUDE-I (THEORY): 3 CREDITS    42 HRS.**

**Course Learning Outcome:** This course will enable the students to;

- ❖ Students have a strong base in the fundamental mathematical concepts.
- ❖ Grasp the appropriate strategies to solve problems with speed and accuracy.
- ❖ Gain appropriate skills to succeed in preliminary selection process for recruitment.

**Unit-1:** Number System, Types of Numbers, series (AP and GP), Algebraic operations BODMAS, Divisibility, LCM and HCF, Fraction, Simplification. **14 Hrs.**



**Unit-2:** Time and Distance, Problems based on Trains, Boats and Streams. **14 Hrs.**

**Unit-3:** Time, work and wages, Pipes and Cistern, Problems on Clock, Problems on Calendar. **14 Hrs.**

## II SEMESTER

**Course Learning Outcomes:** This course will enable the students to:

- ❖ Learn the concept of Divisibility.
- ❖ Learn about prime and composite numbers.
- ❖ Learn the concept of congruences and its applications.
- ❖ Identify and apply the intermediate value theorems and L'Hospital rule.
- ❖ Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
- ❖ Find the extreme values of functions of two variables. Students learn to find areas and volumes using integration.
- ❖ Learn *Free and Open Source Software (FOSS)* tools for computer programming.
- ❖ Solve problem on algebra and calculus by using FOSS software's.
- ❖ Acquire knowledge of applications of algebra and calculus through FOSS.

### Open Elective Course (OE):

**OE-4: OPTIONAL MATHEMATICS-II (THEORY): 3 Credits 42 Hrs.**

**Course Learning Outcome:** On completion of this course, the students will be able to;

- ❖ Learn the concept of Divisibility.
- ❖ Learn about prime and composite numbers.
- ❖ Learn the concept of congruences and its applications.
- ❖ Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
- ❖ Find the extreme values of functions of two variables.
- ❖ To understand the concepts of multiple integrals and their applications.

**OE-5: BUSINESS MATHEMATICS-II (THEORY): 3 Credits 42 Hrs.**

**Course Learning Outcome:** This course will enable the students to;

- ❖ Integrate concepts in international business concept with functioning of global trade.
- ❖ Evaluate the legal, social and economic environment of business.

- ❖ Apply decision-support tools to business decision making.
- ❖ Will be able to apply knowledge of business concepts and functions in an integrated manner.

**OE-6: MATHEMATICAL APTITUDE-II (THEORY): 3 Credits 42 Hrs.**

**Course Learning Outcome:** This course will enable the students to;

- ❖ Have a strong base in the fundamental mathematical concepts.
- ❖ Grasp the approaches and strategies to solve problems with speed and accuracy. Gain appropriate skills to succeed in preliminary selection process for recruitment.

**Bachelor of Science (Basic/Hons.) Degree in Microbiology**  
**Choice Based Credit System (CBCS) With Multiple Entries**  
**And Exit Options under New Education Policy (NEP) – 2020**  
**(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	Discipline Core/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: General Microbiology (4+0+0)	4	4	40	60
	DSCP-1: General Microbiology (0+0+2)	4	2	25	25
	OE-1: Microbial Technology for Human Welfare (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Microbial Biochemistry and Physiology (4+0+0)	4	4	40	60
	DSCP-2: Microbial Biochemistry and Physiology (0+0+2)	4	2	25	25
	OE-2: Environmental and Sanitary Microbiology (3+0+0)	3	3	40	60

**Programme outcome:** By the end of the program the students will be able to:

- Knowledge and understanding of concepts of microbiology and its application in pharma, food, agriculture, beverages, nutraceutical industries.

- Understand the distribution, morphology and physiology of microorganisms and demonstrate the skills in aseptic and ling of microbes including isolation, identification and maintenance.
- Competent to apply the knowledge gained for conserving the environment and resolving the environmental related issues.
- Learning and practicing professional skills in handling microbes and contaminants in laboratories and production sectors.
- Exploring the microbial world and analyzing the specific benefits and challenges.
- Applying the knowledge acquired to undertake studies and identify specific remedial measures for the challenge in health, agriculture, and food sectors.
- Thorough knowledge and application of good laboratory and good manufacturing practices in microbial quality control.
- Understanding biochemical and physiological aspects of microbes and developing broader perspective to identify innovative solutions for present and future challenges posed by microbes.
- Understanding and application of microbial principles in forensic and working knowledge about clinical microbiology.
- Demonstrate the ability to identify ethical issues related to recombinant DNA technology, GMOs, intellectual property rights, biosafety and biohazards.
- Demonstrate the ability to identify key question in microbiological research, optimize search methods, and analyze outcomes by adopting scientific methods, thereby improving the employability.
- Enhance and demonstrate analytical skills and apply basic computational and statistical techniques in the field of microbiology.
- Thorough knowledge and understanding of concepts of microbiology.
- Learning and practicing professional skills in handling microbes.
- Thorough knowledge and application of good laboratory and good manufacturing practices in microbial quality control.

## I SEMESTER

### Programme outcome:

- Knowledge and understanding of concepts of microbiology.
- Learning and practicing professional skills in handling microbes.
- Thorough knowledge and application of good laboratory and good manufacturing practices in microbial quality control.

## II SEMESTER

**Programme outcome:** Thorough knowledge and understanding of concepts of microbiology and its application in different microbiological industries.

**Bachelor of Science (Basic/Hons.) Degree in Physics**  
**Choice Based Credit System (CBCS) With Multiple Entries**  
**And Exit Options under New Education Policy (NEP) – 2020**  
**(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	DisciplineCore/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: Mechanics & Properties of Matter (4+0+0)	4	4	40	60
	DSCP-1: Physics-1 (0+0+2)	4	2	25	25
	OE-1: Energy Sources (2+1+0)	3	3	40	60
	OE-2: Climate Science (2+1+0)	3	3	40	60
<b>II</b>	DSC-2: Electricity and Magnetism (4+0+0)	4	4	40	60
	DSCP-2: Physics-2 (0+0+2)	4	2	25	25
	OE-3: Astronomy and Astrophysics (2+1+0)	3	3	40	60
	OE-4: Medical Physics (2+1+0)	3	3	40	60

**Course Objective:** In this course, we aim to provide a solid foundation in various aspects of Physics, to show a broad spectrum of modern trends in Physics, to develop experimental and mathematical skills of students. The syllabi are framed in such a way that its bridges the gap between the Pre-University and Post graduate levels of Physics, by providing a complete and more logical frame work of basic Physics. The systematic and planned curriculum from first and second semester shall motivate and encourage the students for pursuing higher studies in Physics, engage in research activities and become self-reliant.

**Course Outcomes:** By the end of the first and second semester, the students would have been introduced to powerful tools for tracking a wide range of topics in **Mechanics & Properties of Matter and Electricity & Magnetism**. Further developed their experimental skills through a series of experiment which illustrates major themes of the lecture courses.

**Bachelor of Science (Basic/Hons.) Degree in Sericulture**  
**Choice Based Credit System (CBCS) With Multiple Entries**  
**And Exit Options under New Education Policy (NEP) – 2020**  
**(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

<b>Sem.</b>	<b>DisciplineCore/ Paper (L+T+P)</b>	<b>Teaching hours/ week</b>	<b>Credits</b>	<b>Internal Assessment Marks (C1 + C2)</b>	<b>Semester End Examination Marks (C3)</b>
<b>I</b>	DSC-1: Fundamentals of Sericulture (4+0+0)	4	4	40	60
	DSCP-1: Fundamentals of Sericulture (0+0+2)	4	2	25	25
	OE-1: Science of Sericulture (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Mulberry Biology and Cultivation (4+0+0)	4	4	40	60
	DSCP-2: Mulberry Biology and Cultivation (0+0+2)	4	2	25	25
	OE-2: Mulberry Crop Production Technology (3+0+0)	3	3	40	60

**Program Outcomes:** By the end of the program the students will be able to:

- Acquire competency in the discipline with sound knowledge and skill to secure B.Sc. (Basic) or B.Sc. (Hons) degree in Sericulture.
- Know the different components and chain link of sericulture industry.
- Understand concepts of sericulture industry and demonstrate interdisciplinary skills acquired in mulberry plant cultivation, silkworm rearing, diagnosis of diseases and pest of mulberry and silkworm and their prevention and its relevance in Seri-farmer's livelihood.
- Demonstrating the Laboratory and field skills in mulberry cultivation and silk worm rearing with an emphasis on technological aspects.
- Competent to transfer the knowledge and technical skills to the Seri-farmers.
- Critically analyze the environmental issues and apply in management of mulberry garden and silkworm rearing at field.
- Demonstrate comprehensive innovations and skills in improvement of mulberry

- and silkworm varieties for betterment of sericulture industry and human welfare.
- Apply knowledge and skills of seri biotechnology for development new mulberry variety and silkworm breeds suitable for varied agro-climatic zones.
  - Apply tools and techniques of biostatistics for critical analysis and interpretation of data accrued.
  - Use bioinformatics tools and techniques for the analysis and interpretation of biomolecular data for better understating mulberry and silk worm.
  - Aptly demonstrate communication skills, scientific writing, data collection and interpretation abilities in all the fields of seri biotechnology.
  - Thorough knowledge and application of good laboratory and good manufacturing practices in sericulture and biotech industries.
  - Demonstrate entrepreneurship abilities, innovative thinking, planning, and setting up small-scale enterprises.

## I SEMESTER

**Course outcome:** At the end of the course the student should be able to:

- Acquire sound knowledge on different components of sericulture industry,
- Gain skill with hands on training on mulberry cultivation and carry forward to field,
- Gain skill with hands on training on silk worm egg production and support grain age activity,
- Acquire knowledge and develop skill in silkworm rearing and support silk worm farming.
- With the knowledge and skill acquired students may not only acts as resource personnel to sericulture industry but also emerged as potential entrepreneur.

**Program Outcomes (POs):**

- ❖ Students would gain brief background on different components of Sericulture.
- ❖ They will have awareness on the origin, growth and status of sericulture industry across the globe.

## II SEMESTER

**Course outcome:** At the end of the course the student should be able to:

- Program outcomes that the course addresses: Students would know all about mulberry plant and cultivars in the field.
- They would gain knowledge and acquire skill in cultivation of mulberry plants in the garden.

### Open Elective Course (OE):

**OE-2: MULBERRY CROP PRODUCTION TECHNOLOGY (THEORY):**

**3 Credits**

**42 Hrs.**

**Bachelor of Science (Basic/Hons.) Degree in Statistics**  
**Choice Based Credit System (CBCS) With Multiple Entries**  
**And Exit Options under New Education Policy (NEP) – 2020**  
**(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	DisciplineCore/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: Descriptive Statistics (4+0+0)	4	4	40	60
	DSCP-1: Descriptive Statistics (0+0+2)	4	2	25	25
	OE-1: Statistical Methods and applications (3+0+0)	3	3	40	60
	OE-2: Business Statistics (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Probability and Distributions-I (4+0+0)	4	4	40	60
	DSCP-2: Probability and Distributions-I (0+0+2)	4	2	25	25
	OE-3: Applied Statistics (3+0+0)	3	3	40	60
	OE-4: Bio-Statistics (3+0+0)	3	3	40	60

**Programme objectives:**

- Graduates will demonstrate competence in respective domain as they apply skills to conduct scientific research and contribute to quality education.
- Graduates will be recognized as experts in educational and research institutes as well as industries in identifying and solving global challenges.
- Graduates will become leading researchers and professors who create and disseminate new knowledge in scientific and allied fields.

**Programme outcome:** The student graduating with the Statistics should be able to

- ❖ **Discipline Knowledge** : Use knowledge of science and apply to relevant areas.
- ❖ **Problem analysis**: Identify, formulate and analyze complex scientific problems using first principles of respective discipline.
- ❖ **Problem solving**: Execute a solution process using first principles of science to solve problems related to respective discipline.

- ❖ **Conduct investigations:** Conduct investigations of issues using research methods and research-based discipline knowledge including design of experiments, data collection, interpretation and analysis to arrive at valid conclusions.
- ❖ **Modern tool usage:** Identify, select and use modern scientific, Software/programming languages tool or technique for modeling, prediction, data analysis and solving problems in the areas of their discipline
- ❖ **Environment and Society:** Evaluate the impact of scientific solutions on society and environment and design sustainable solutions.
- ❖ **Ethics:** Demonstrate professional ethics, responsibilities and norms in respective profession.
- ❖ **Individual and teamwork:** Work effectively as an individual as a team member and as a leader in a multi-disciplinary team.
- ❖ **Communication:** Communicate effectively with the stakeholders with emphasis on communicating with scientific community, comprehend scientific reports, write research papers and projects proposals and reports, deliver effective presentations, and give and receive clear instructions.
- ❖ **Project Management and Finance:** Apply the knowledge of scientific and technological principles to one's own work to manage projects in multi-disciplinary settings.
- ❖ **Lifelong Learning:** Identify knowledge gaps and engage in lifelong learning in the context of changing trends in respective discipline.

**Course Outcomes:** At the end of the semesters courses the students should be able to:

- ❖ Acquire knowledge of introductory statistics, its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
- ❖ Learn various types of data, their organization and descriptive statistics such as presentation in tabular form graphs and summary measures such as measures of central tendency and dispersion etc.
- ❖ Learn correlation, curve fitting, regression analysis, regression diagnostics, partial and multiple correlations.
- ❖ Learn different types of data reflecting independence and association between two or more attributes.
- ❖ Conceptualize the probabilities of events including frequentist and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes' Theorem and able to solve problems on the set topics.
- ❖ Learn concept of discrete and continuous random variables and their probability distribution including expectation and moments.
- ❖ Learn Standard univariate discrete and continuous distributions and their applications in disciplines of science.
- ❖ Learn basics of R-programming and able to write and execute R codes in descriptive



statistics, probability models and fitting of suitable distributions to the given dataset, applications of normal and other standard distributions.

### **Open Elective Course (OE):**

#### **OE-1: STATISTICAL METHODS ITS APPLICATIONS(THEORY): 3 Credits 42 Hrs.**

##### **Course Objectives:**

- This is an open elective course for other than statistics students.
- The students will learn the elements of descriptive statistics, probability, statistical methods such as tests of hypotheses, correlation and regression.

**Course Outcome:** On completion of this course, the students will be able to;

- ❖ Acquire knowledge of statistical methods.
- ❖ Identify types of data and visualization, analysis and interpretation.
- ❖ Learn elementary probability and probability models.
- ❖ Learn to apply test procedures for given data set.

#### **OE-2: BUSINESS STATISTICS (THEORY): 3 Credits 42 Hrs.**

##### **Course Objectives:**

- Provide an introduction to basics of statistics with in a financial context.
- To enable students to use statistical techniques for analysis and interpretation of business data.

**Course Outcome:** On completion of this course, the students will be able to;

- ❖ Frame and formulate management decision problems.
- ❖ Understand the basic concepts under lying quantitative analysis.
- ❖ Use sound judgment in the applications of quantitative methods to management decisions.

### **Open Elective Course (OE):**

#### **OE-3: APPLIED STATISTICS (THEORY): 3 Credits 42 Hrs.**

##### **Course Objectives:**

- To enable the students to use statistical tools in finance, industries, population studies and health sciences.
- To acquire knowledge about sampling methods for surveys.

**Course Outcome:** On completion of this course, the students will be able to;

- ❖ Understand the Price and Quantity Index numbers and their different measures, understand the applicability of cost-of-living Index number.
- ❖ Know the components and Need for Time series, understand the different methods

of studying trend and Seasonal Index.

- ❖ Study the concept of vital statistics, sources of data, different measures of Fertility and Mortality, Understand the Growth rates-GRR and NRR and their inter pretations.
- ❖ Know the concept to Population, Sample, Sampling unit, sampling design, sampling frame, sampling scheme, need for sampling, apply the different sampling methods for designing and selecting a sample from a population, explain sampling and non-sampling errors.
- ❖ Describe the philosophy of statistical quality control tools as well as their usefulness in industry and hence develop quality control tools in agiven situation.

**OE-4: BIO-STATISTICS (THEORY): 3 Credits 42 Hrs.**

#### Course Objectives:

- To enable the students to identify the variables of biological studies and explore the tools of classification and presentation.
- To study the probability notion, models and their applications in the study of biological phenomenon.
- To acquire knowledge on sampling distribution and testing of hypotheses.

**Course Outcome:** On completion of this course, the students will be able to;

- ❖ After studying the course, the student will be able to apply statistical too ls and techniques in data analysis of biological sciences.

## **Bachelor of Science (Basic/Hons.) Degree in Zoology**

### **Choice Based Credit System (CBCS) With Multiple Entries**

### **And Exit Options under New Education Policy (NEP) – 2020**

#### **(2021-22 Batch Onwards)**

#### **Details of Course of Study: I and II Semesters**

Sem.	Discipline Core/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	DSC-1: Cytology, Genetics & Infectious Diseases (4+0+0)	4	4	40	60
	DSCP-1: Cytology, Genetics & Infectious Diseases (0+0+2)	4	2	25	25
	OE-1: Economic Zoology (3+0+0)	3	3	40	60
<b>II</b>	DSC-2: Biochemistry and Physiology (4+0+0)	4	4	40	60
	DSCP-2: Biochemistry and Physiology (0+0+2)	4	2	25	25
	OE-2: Parasitology (3+0+0)	3	3	40	60

## I SEMESTER

### Learning/Course outcome:

**Cell biology:** After studying this portion of syllabus students are able to learn and understand the fundamentals of Cell biology like;

- Cell organelles, Cytoskeleton, Cellular transport, Cell-extracellular matrix interaction, Cell division, and Protein trafficking etc.,
- Students will be able to understand the structures and basic components of Prokaryotic and Eukaryotic cells, especially Macromolecules, Membranes, and Organelles
- Students will understand how these cellular components are used to generate and utilize energy in cells
- Be able to know the basic elements of intercellular signal transduction pathways, including nuclear receptors and cell surface receptors.
- To demonstrate the knowledge of common and advanced laboratory practices in cell and molecular biology.
- Cells house the biological machinery that makes the proteins, chemicals, and signals responsible for everything that happens inside our bodies.
- The learner will understand the importance of cell as a structural/functional unit of life.
- The dynamism of bio membranes indicates the dynamism of life. Its working mechanism and precision are responsible for our performance in life.
- To acquire knowledge of principles and working mechanisms of simple and compound Microscopes.
- Be able to understand the mechanism of Mitosis and Meiosis.
- To gain knowledge about slide preparation to observe Giant chromosome, Epithelial, Nerve cell, Muscle cells and Blood cells.

### Open Elective Course (OE):

**OE-1: ECONOMIC ZOOLOGY (THEORY):            2 Credits    42 Hrs.**

**Course outcome:** At the end of the course the student will be able to:

- Gain knowledge to define the concepts of the applied subjects like Fisheries, Aquaculture, Sericulture, Apiculture, Vermiculture, Lac culture, Dairy, Poultry etc.,
- Gain knowledge about Silkworms rearing and their products.
- Gain knowledge in Bee keeping equipment and Apiary management.
- Acquaint knowledge on dairy animal management, the breeds and diseases of cattle and learn the testing of egg and milk quality.
- Acquaint knowledge about the culture techniques of fish and poultry.
- The student will be able to identify, freshwater, marine water fishes.
- To understand the physiology and reproductive mechanisms of important fishes.

- Attained knowledge about important cultivable fin fishes, shell fishes and importance of value added fishery products.
- Be able to gain knowledge to explain the tools and techniques used in aquaculture, agriculture, apiculture and sericulture practices.
- Students will be able to categorize economically important fish species.
- Be able to describe the economic importance of honeybee and silk worm.
- Acquaint the knowledge about basic procedure and methodology of Vermi culture.
- Learn various concepts of lac cultivation.
- Students can start their own business i.e. self-employments.
- Get employment in different applied sectors.

## II SEMESTER

### Learning/Course outcome:

**Biochemistry:** Study of biochemistry help student to understand the chemical structure of carbohydrates, proteins and lipids and also mechanism of their metabolism. This course lays the foundation for other advanced courses like physiology, molecular biology and immunology. The student at the completion of the course will learn;

- The importance of chemical foundation in living organisms to attain the knowledge of macromolecule such as carbohydrates, protein and fat, their types and significance.
- Correlate how the large biomolecules such as proteins, carbohydrates, lipids, nucleic acids are made from the simple precursors.
- Interpret the structure-function relationships of the proteins, carbohydrates, lipids, and nucleic acids.
- Be able to familiar with the enzymes (biocatalysts), and their salient attributes including unique conformation and amazing catalytic properties.
- To recognize how the catabolic breakdown of the substances is associated with release of free energy; whereas, free energy is utilized during synthesis of biomolecules i.e., anabolic pathways.
- Comprehended the energy source, chemical bonds and the principles of thermo dynamic understood the importance of acid base balance.

**Physiology:** This course is designed to impart knowledge of functioning of circulatory, respiratory, digestive, muscular and excretory system. After successfully completing this programme;

- ❖ Students will be able to aware the molecular and cellular basis of physiological functions in animals.
- ❖ The course will aid to understand the basics of excretory system like structure of nephron, glomerular filtration, reabsorption and tubular secretion, homeostatic regulation of water and electrolyte.

- ❖ To learn and understand the fundamentals of Respiratory system & chemical regulation of respiration.
- ❖ Be able to illustrate the physiological adaptations, development, reproduction and behaviour of different forms of life.
- ❖ Students will be able to understand about the composition of food and mechanism of digestion, absorption and assimilation.
- ❖ To described the mechanism of circulation and composition of blood.
- ❖ Students will acquire knowledge of neuromuscular coordination and the mechanism of Osmoregulation in animals and endocrine system and their function.

**Practicals:** At the end of the course the student should be able to understand the:

- ❖ Basic structure of biomolecules through model making.
- ❖ Develop the skills to identify different types of blood cells.
- ❖ Enhance basic laboratory skill like keen observation, analysis and discussion.
- ❖ Learn the functional attributes of biomolecules in animal body.
- ❖ Know uniqueness of enzymes in animal body and their importance through enzyme kinetics.

### **Open Elective Course (OE):**

**OE-2: PARASITOLOGY (THEORY):                      2 Credits      42 Hrs.**

**Course outcome:**

**Parasitology:** Parasitology is the scientific discipline concerned with the study of the biology of parasites and parasitic diseases, including the distribution, biochemistry, physiology, molecular biology, ecology, evolution and clinical aspects of parasites, and the host response to these agents. This course will be able to know the students to;

- Identify, describe and contrast unicellular parasites and parasitic worms.
- Helps to understand the specific human and non-human parasitic diseases.
- Be able to prepare and observe live parasitic specimens and test students' own seropositivity for a particular parasitic infection.
- It is estimated that at least half of all known species are parasitic, so understanding the life cycle and interaction of these organisms with their hosts is often key to understanding the dynamics of ecosystems generally.
- By analyzing microorganisms up close, microbiologists play a crucial role in combating disease, creating chemical products for agriculture, and even helping to keep our planet earth healthy.

## Bachelor of Computer Applications (BCA) (Basic/Hons.) Degree Programme

### Choice Based Credit System (CBCS) With Multiple Entries And Exit Options under New Education Policy (NEP) – 2020 (2021-22 Batch Onwards)

#### Details of Course of Study: I and II Semesters

Sem.	DisciplineCore/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
I	CA C-1: Fundamentals of Computers (3+0+0)	3	3	40	60
	CA CP-1: Information Technology (0+0+2)	4	2	25	25
	CA C-2: Programming in C (3+0+0)	3	3	40	60
	CA CP-2: C Programming (0+0+2)	4	2	25	25
	CA C-3: Accountancy (3+0+0)	3	3	40	60
II	CA C-4: Data Structures using C (3+0+0)	3	3	40	60
	CA CP-3: Data Structure (0+0+2)	4	2	25	25
	CA C-5: Object Oriented Concepts using JAVA (3+0+0)	3	3	40	60
	CA CP-4: JAVA (0+0+2)	4	2	25	25
	CA C-6: Discrete Mathematical Structures (3+0+0)	3	3	40	60

#### Objectives:

- The primary objective of this program is to provide a foundation of computing principles and business practices for effectively using/managing information systems and enterprise software.
- It helps students analyze the requirements for system development and exposes students to business software and information systems.
- This course provides students with options to specialize in legacy application software, system software or mobile applications.
- To produce outstanding IT professionals who can apply the theoretical knowledge into practice in the real world and develop standalone live projects themselves.

- To provide opportunity for the study of modern methods of information processing and its applications.
- To develop among students, the programming techniques and the problem-solving skills through programming.
- To prepare students who wish to go on to further studies in computer science and related subjects.
- To acquaint students to Work effectively with a range of current, standard, Office Productivity software applications.

**Programme outcome:**

The Bachelor of Computer Application (BCA (Hons)) program enables students to attain following additional attributes besides the afore-mentioned attributes, by the time of graduation: At the end of the course the student should be able to:

- **Discipline knowledge:** Acquiring knowledge on basics of Computer Science and ability to apply to design principles in the development of solutions for problems of varying complexity.
- **Problem Solving:** Improved reasoning with strong mathematical ability to Identify, formulate and analyze problems related to computer science and exhibiting a sound knowledge on data structures and algorithms.
- **Design and Development of Solutions:** Ability to design and development of algorithmic solutions to real world problems and acquiring a minimum knowledge on statistics and optimization problems. Establishing excellent skills in applying various design strategies for solving complex problems.
- **Programming a computer:** Exhibiting strong skills required to program a computer for various issues and problems of day-to-day applications with thorough knowledge on programming languages of various levels.
- **Application Systems Knowledge:** Possessing a sound knowledge on computer application software and ability to design and develop app for applicative problems.
- **Modern Tool Usage:** Identify, select and use a modern scientific and IT tool or technique for modeling, prediction, data analysis and solving problems in the area of Computer Science and making them mobile based application software.
- **Communication:** Must have a reasonably good communication knowledge both in oral and writing.
- **Project Management:** Practicing of existing projects and becoming independent to launch own project by identifying a gap in solutions.

- **Ethics on Profession, Environment and Society:** Exhibiting professional ethics to maintain the integrity in a working environment and also have concern on societal impacts due to computer-based solutions for problems.
- **Lifelong Learning:** Should become an independent learner. So, learn to learn ability.
- **Motivation to take up Higher Studies:** Inspiration to continue educations towards advanced studies on Computer Science.
- Apply standard Software Engineering practices and strategies in real -time software project development.
- Design and develop computer programs/computer -based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics.
- Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems.
- The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.
- The ability to work independently on a substantial software project and as an effective team member.

## I SEMESTER

### Course Outcomes:

- Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, micro controllers.
- Operating systems, functions of operating systems, classification of operating systems, kernel, shell, basics of Unix, shell programming, booting.
- Databases, why databases are used, users, SQL, data types in SQL, introduction of queries - select, alter, update, delete, truncate, using where, and or in not in.
- Internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching.
- Web Programming basics, introduction of HTML and CSS programming.
- Introduction of computers, classification of computers, anatomy of computer, constituents and architecture, micro controllers.
- Confidently operate Desktop Computers to carry out computational tasks.
- Understand working of Hardware and Software and the importance of operating systems.



- Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts.
- Read, understand and trace the execution of programs written in C language.
- Write the C code for a given problem.
- Perform input and output operations using programs in C.
- Write programs that perform operations on arrays.
- Study and understand Accounting, systems of Book, Branches of accounting advantage and limitations.
- Know the concept of accounting, financial accounting process and Journalization.
- Maintenance different account book and reconciliations.
- Preparations of different bills, and trial balance.
- Understand the basic concepts of Mathematical reasoning, set and functions.

## II SEMESTER

**Course Outcomes:** After completing this course satisfactorily, a student will be able to:

- Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.
- Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.
- Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs.
- Demonstrate different methods for traversing trees.
- Compare alternative implementations of data structures with respect to performance
- Describe the concept of recursion, give examples of its use.
- Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.
- Understand the features of Java and the architecture of JVM.
- Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done.
- Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance.
- The students will be able to demonstrate programs based on interfaces and threads and explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Language.
- Write, compile, execute Java programs that include GUIs and event driven programming and also programs based on files.
- Implement Object Oriented programming concept using basic syntaxes of control Structures.

- Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem.
- Demonstrates how to achieve reusability using inheritance.
- Demonstrate understanding and use of interfaces, packages, different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- Identify and describe common user interface components to design GUI in Java using Applet & AWT along with response to events.

**CA C-6: DISCRETE MATHEMATICAL STRUCTURES(THEORY):**

**3 Credits**

**42 Hrs.**

**Course Outcomes:** After completing this course satisfactorily, a student will be able to:

- To understand the basic concepts of Mathematical reasoning, set and functions.
- To understand various counting techniques and principle of inclusion and exclusions.
- Understand the concepts of various types of relations, partial ordering and equivalence relations.
- Apply the concepts of generating functions to solve the recurrence relations.
- Familiarize the fundamental concepts of graph theory and shortest path algorithm.

**Bachelor of Business Administration (BBA) (Basic/Hons.)Degree Programme**

**Choice Based Credit System (CBCS) With Multiple Entries**

**And Exit Options under New Education Policy (NEP) – 2020**

**(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	DisciplineCore/ Open Elective Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	BBA C-1: Management Principles & Practice (4+0+0)	4	4	40	60
	BBA C-2: Fundamentals of Business Accounting (4+0+0)	4	4	40	60

	BBA C-3: Marketing Management (4+0+0)	4	4	40	60
	OE-1: Business Organization (3+0+0)	3	3	40	60
	OE-2: Office Organization and Management (3+0+0)	3	3	40	60
<b>II</b>	BBA C-4: Financial Accounting and Reporting (4+0+0)	4	4	40	60
	BBA C-5: Human Resource Management (4+0+0)	4	4	40	60
	BBA C-6A: Business Environment OR BBA C-6A: Business Mathematics (4+0+0)	4	4	40	60
	OE-3: People Management (3+0+0)	3	3	40	60
	OE-4: Retail Management (3+0+0)	3	3	40	60

### Objectives:

- To develop the skills required for the application of business concepts and techniques learned in the classroom at the workplace.
- To provide competent and technical skills personnel to the industry in the area of Marketing, Finance, Human Resource, Data Analytics, Retailing and Logistics and Supply Chain Management. To enhance the employability skills of the management students.
- To enhance the capability of the students, improve their decision-making skills.
- To encourage entrepreneurship among students pursuing education in the field of Business Administration.
- To empower students for pursuing professional courses like MBA, Chartered Accountancy, Company Secretary, etc.,
- To ensure holistic development of Business administration students.

## I SEMESTER

### **BBA C-1: MANAGEMENT PRINCIPLES & PRACTICE (THEORY): 4 Credits 56 Hrs.**

**Course Outcomes:** On successful completion of the course, the students will demonstrate;

- The ability to understand concepts of business management, principles and function of management.
- The ability to explain the process of planning and decision making.

- The ability to create organization structures based on authority, task and responsibilities.
- The ability to explain the principles of direction, importance of communication, barrier of communication, motivation theories and leadership styles.
- The ability to understand the requirement of good control system and control techniques.

**BBA C-2: FUNDAMENTALS OF BUSINESS ACCOUNTING (THEORY):**

**4 Credits**

**56 Hrs.**

**Course Outcomes:** On successful completion of the course, the students will demonstrate;

- Understand the framework of accounting as well accounting standards.
- The Ability to pass journal entries and prepare ledger accounts.
- The Ability to prepare subsidiaries books.
- The Ability to prepare trial balance and final accounts of proprietary concern.
- Construct final accounts through application of tally.

**BBA C-3: MARKETING MANAGEMENT (THEORY): 4 Credits 56 Hrs.**

**Course Outcomes:** On successful completion of the course, the students will demonstrate;

- Understand the concepts and functions of marketing.
- Analyse marketing environment impacting the business.
- Segment the market and understand the consumer behavior.
- Describe the 4 p's of marketing and also strategize marketing mix.
- Describe 7 p's of service marketing mix.

**Open Elective Course (OE):**

**OE-1: BUSINESS ORGANIZATION (THEORY): 3 Credits 45 Hrs.**

**Course Outcomes:** On successful completion of the course, the students will demonstrate:

- An understanding of the nature, objectives and social responsibilities of business.
- An ability to describe the different forms of organisations.

- An understanding of the basic concepts of management.
- An understanding of functions of management.
- An understanding of different types of business combinations.

**OE-2: OFFICE ORGANIZATION AND MANAGEMENT (THEORY):3 Credits 45 Hrs.**

**Course Outcomes:** On successful completion of the course, the students will demonstrate;

- An understanding of basic knowledge of office organisation and management.
- Demonstrate skills in effective office organization.
- Ability to maintain office records.
- Ability to maintain digital record.
- Understanding of different types of organisation structures and responsibilities as future office managers.

## II SEMESTER

**BBA C-4: FINANCIAL ACCOUNTING AND REPORTING (THEORY): 4 Credits 56 Hrs.**

**Course Outcomes:** On successful completion of the course, the students will demonstrate;

- The ability to prepare final accounts of partnership firms.
- The ability to understand the process of public issue of shares and accounting for the same
- The ability to prepare final accounts of joint stock companies.
- The ability to prepare and evaluate vertical and horizontal analysis of financial statements.
- The ability to understand company's annual reports.

**BBA C-5: HUMAN RESOURCE MANAGEMENT (THEORY): 4 Credits 56 Hrs.**

**Course Outcomes:** On successful completion of the course, the students will be able to demonstrate;

- Ability to describe the role and responsibility of Human resources management functions on business.
- Ability to describe HRP, Recruitment and Selection process.
- Ability to describe to induction, training, and compensation aspects.
- Ability to explain performance appraisal and its process.
- Ability to demonstrate Employee Engagement and Psychological Contract.

**BBA C-6A: BUSINESS ENVIRONMENT (THEORY): 4 Credits 56 Hrs.**

**Course Outcomes:** On successful completion Student will demonstrate;

An Understanding of components of business environment. Ability to analyse the environmental factors influencing business organisation. Ability to demonstrate

Competitive structure analysis for select industry. Ability to explain the impact of fiscal policy and monetary policy on business. Ability to analyse the impact of economic environmental factors on business.

**BBA C-6B: BUSINESS MATHEMATICS (THEORY):      4 Credits      56 Hrs.**

**Course Outcomes:** On successful completion Student will demonstrate;

- The Understanding of the basic concepts of business maths and apply them to create solve and interpret application problems in business.
- Ability to solve problems on various types of equation.
- Ability to solve problems on Matrices and execute the laws of indices, law of logarithm and evaluate them.
- Ability to apply the concept of simple interest and compound interest bills discounted etc. and apply them in day-to-day life.
- Ability to solve problems on Arithmetic progression, Geometric progression and construct logical application of these concepts.

### **Open Elective Course (OE):**

**OE-3: PEOPLE MANAGEMENT (THEORY):      3 Credits      45 Hrs.**

**Course outcome:** On successful completion of the course, student will demonstrate:

- Ability to examine the difference between People Management with Human Resource Management.
- Ability to explain the need for and importance of People Management.
- Ability to explain role of manager in different stages of performance management process.
- Ability to list modern methods of performance and task assessment.
- Ability to analyse the factors influencing the work life balance of a working individual.

**OE-4: RETAIL MANAGEMENT (THEORY):      3 Credits      45 Hrs.**

**Course Outcomes:** On successful completion Student will demonstrate;

- An understanding of the types and forms of Retail business.
- Ability to examine Consumer Behaviour in various environment.
- Ability to analyse various Retail operations and evaluate them.
- Ability to analyse various marketing mix elements in retail operations.
- An understanding of Information Technology in retail business.

**Bachelor of Science (Basic/Hons.)/Integrated M.Sc. (Five Years)  
Degree in Molecular Biology**

**Choice Based Credit System (CBCS) With Multiple Entries  
And Exit Options under New Education Policy (NEP) – 2020  
(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	DisciplineCore/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	MBDSC-1: General Botany (4+0+0)	4	4	40	60
	MBDSCP-1: General Botany (0+0+2)	4	2	25	25
	MBDSC-2: General Zoology (4+0+0)	4	4	40	60
	MBDSCP-2: General Zoology (0+0+2)	4	2	25	25
<b>II</b>	MBDSC-3: Cell Biology and Plant Physiology-I (4+0+0)	4	4	40	60
	MBDSCP-3: Cell Biology and Plant Physiology-I (0+0+2)	4	2	25	25
	MBDSC-4: Inorganic & Physical Chemistry (4+0+0)	4	4	40	60
	MBDSCP-4: Inorganic & Physical Chemistry (0+0+2)	4	2	25	25

**Programme opportunities:**

- Students with B.Sc. Molecular Biology shall be eligible for 2 years M.Sc. in Molecular biology and Biochemistry, Biotechnology, Environmental Science.
- Students with B.Sc. Honors in Molecular Biology shall be eligible for One year M.Sc. in Molecular Biology
- Students with B.Sc. Molecular Biology shall be eligible for B.Ed.
- Students with B.Sc. Honors/ Integrated M.Sc. (Five years) Molecular biology shall be eligible for B.Ed. and also shall be eligible for PUC teaching and courses involved with interdisciplinary subjects in Biology at graduate and Masters level after meeting the minimum standards through KSET/NET/Ph. D. degree

as per the rules and regulations laid by UGC from time to time.

- Students with B.Sc. degree/ B.Sc. Honors/ Integrated M.Sc. (Five Years) Molecular biology in Molecular Biology shall be eligible to take up all competitive examinations at state/national level.

## I SEMESTER

**MBDSC-1: GENERAL BOTANY (THEORY):            4 Credits    56 Hrs.**

### Course outcome:

- Students understand the basis for classifying fungi and plants.
- They gain knowledge on the types and importance of classification.
- Students know external morphology of algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms.
- They acquire the knowledge of cellular diversity of fungi and plants starting from unicellular to highly complex angiosperm plants.
- They gain insight into the varied types of reproductive cycles of fungi and plants.
- Knowledge gained on the economic importance of different fungi and plants help them in future for research and other applications in agriculture, medicine and industry.
- Students understand the course of evolution in plants.

**MBDSCP-1: GENERAL BOTANY (PRACTICALS):            2 Credits    56 Hrs.**

### Course outcome:

- Students understand the use of binocular microscope for understanding biology.
- They get practical knowledge of the aspects studied in theory.
- Students see and appreciate the beauty of phytoplanktons and other algae.
- They will see and understand better the microscopic and macroscopic stages of some of the fungi of kingdom mycota and oomycota.
- They gain insight into the views of internal structure and external morphology of different groups of plants such as bryophytes, pteridophytes and gymno sperms.
- Students get the skill of her barium preparation.

**MBDSC-2: GENERAL ZOOLOGY (THEORY):            4 Credits            56 Hrs**

### Course outcome:

- Students will understand the basis for classifying animals.
- They will gain knowledge on the types and importance of classification.
- Students will know external morphology of different phyla of animals starting from Protozoa to Chor data.
- They will acquire the knowledge of different types of tissues animals with special emphasis to humans. This gives a clear dimension to the students regarding their role in different organs.



- They will gain insight into the varied types of reproductive behavior of different groups of animals. This knowledge forms a basis for further research.
- Over view of human system also gives a foundation to understand a course on Animal Physiology in the fourth semester.
- Knowledge gained on the economic importance of different animals help them in future for research and other applications in agriculture, medicine and industry.

**MBDSC-2; GENERAL ZOOLOGY (PRACTICALS):            2 Credits            54 Hrs.**

**Course outcome:**

- Students get practical knowledge of the aspects studied in theory.
- Students see and appreciate the beauty of zoo planktons and other aquatic animals.
- They will see and understand better animal diversity.
- They gain better insight of osteology.
- Students get the skill of plastination.

## II SEMESTER

**MBDSC -3: CELL BIOLOGY AND PLANT PHYSIOLOGY (THEORY): 4 Credits 56 Hrs.**

**Course outcome:**

- Students will understand the structure and functions of cell organelles.
- They will acquire knowledge of mechanisms of cell membrane transport.
- They will get the knowledge on the role of ligands and receptors for cell signaling.
- This will enable them to understand the internal features of the cell and cell mobility.
- They will understand the stages of cell division, cell cycle.
- They will gain knowledge on principle and applications of microscopy.
- Students will understand the plant water relation, solute transport, different bio-physico-chemical phenomenon.
- Students will understand the mechanism of crop stress tolerance to various abiotic stresses.
- Students will be able to integrate and apply their knowledge of plant physiology for analytical thinking and solving practical problems experienced in agricultural systems.

**MBDSCP-3: CELL BIOLOGY AND PLANT PHYSIOLOGY (PRACTICALS):**

**2 Credit**

**56 Hrs;**

**Course outcome:**

- Students will practical knowledge of the theoretical aspects studied.
- They will acquire cell biology practical skills such as haematology, cell viability, microtomy and DNA isolation.
- Skills on estimation of amino acid related to stress in plants is also imparted.

**MBDSC-4: INORGANIC AND PHYSICAL CHEMISTRY (THEORY) 04 Credits 56 Hrs.****Course outcome:**

- Students will understand the behavior of gases and their laws, atomic structure and chemical bonding.
- Important techniques like chromatography and X-ray crystallography are discussed which helps students in academia and research.
- They will understand bioinorganic chemistry, chemistry of biologically important elements which bridges the gap between chemistry and biology for better relationship between both.
- Students will understand the phenomenon of photochemistry.
- Students will learn about the electro chemical cell and its conductance in detail.
- Basic understanding of chemical kinetics and catalysis of reactions help students to better understand in higher semester paper enzymology

**Details of Course of Study: I and II Semesters**

Sem.	DisciplineCore/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
I	AECC: (L2-1): English (3+0+0)	4	3	40	60
II	AECC: (L2-2): English (3+0+0)	4	3	40	60

**I SEMESTER****Course Objectives:**

- ❖ To introduce basic grammar through ample practice exercises for effective language learning.
- ❖ To teach to use vocabulary appropriately and grammatical structures correctly.
- ❖ To adopt strategies for developing effective reading and listening skills while engaging students in using correct pronunciation.
- ❖ To instill confidence and develop competence in students in order to communicate in grammatically correct English.
- ❖ Develop the skill to translate texts from one language to another.

**Programme outcome:**

- Students will be able to enrich their vocabulary and enhance their comprehension skills.

- They will acquire grammatical competence and communicative skill which in turn will improve their command over English.
- Students will acquire greater fluency in English which is an important dimension of language learning.

## II SEMESTER

### Course Objectives:

- ❖ To adopt strategies for developing effective reading and listening skills while engaging students in using correct pronunciation.
- ❖ To introduce basic grammar through ample practice exercises for effective language learning.
- ❖ To teach the students to use vocabulary appropriately and grammatical structures correctly.
- ❖ To instil confidence and develop competence in students in order to communicate in grammatically correct English.

### Programme outcome:

- Students will be able to enrich their vocabulary and enhance their comprehension skills.
- They will acquire grammatical competence and communicative skill which in turn will improve their command over English.
- Students will acquire greater fluency in English which is an important dimension of language learning.

### **Ability Enhancement Compulsory Course (AECC)-Languages for B.Sc. (Basic/Hons.), B.C.A. (Basic/Hons.), B.B.A. (Basic/Hons.) and B.Sc. (Basic/Hons.)/Integrated Master (Five years) Degree in Molecular Biology**

#### **Choice Based Credit System (CBCS) With Multiple Entries And Exit Options under New Education Policy (NEP) – 2020 (2021-22 Batch Onwards)**

#### Details of Course of Study: I and II Semesters

Sem.	Discipline Core/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
I	AECC: (L1-1): Kannada (3+0+0)	4	3	40	60

II	AECC: (L1-2): Kannada (3+0+0)	4	3	40	60
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Course Title

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**WÀIPÀ -1 PÀÉÀßqÀ ÉÁqÀÄ-ÉÄÄr-aAvÀÉÉ:**

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PÉëÄvÀæUÀ¼Ä°èÉÄ ,ZsÀPÀgÄÄ, ¢ÄÄ°AvÀézÀ Z¼ÄÄª½UÀ¼ÄÄ,  
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**WÀIPÀ -2 "sÀÆ«Ä:**

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**WÄIPÄ- 4: ÄAQÄtð**

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**WÄIPÄ -1 PÄŁÄßqÄ ŁÄqÄÄ-ŁÄÄr-aAvÄŁÉ:** PÄŁÄßqÄ ŁÄqÄÄ gÄÆ²ÄÄUÉÆAqÄzÄÝjAzÄ ¸ÄægÄA©ü¹ CzÄgÄ ²æÄ²ÄÄAwPÉ, ²ÉÉ²µÄÖöävÉ, CzÄgÄ -ÉÆÄPÄzÄÈ¶Ö, PÄ-Ä ¸ÄæPÄgÄUÄ¼Ä°èŁÄ Ä²ÄÄÈzÄßvÉ, gÄdQÄAiÄÄ Ä²ÄiÄfPÄ aAvÄŁÉUÄ¼ÄÄ ÉÆéÄ²ÄdÖvÉ, CzÄgÄ °sÉUÉÆÄ½PÄ ÉAzÄAiÄÄð, ««zsÄ PÉéÄvÄæUÄ¼Ä°èŁÄ ÄzsÄPÄgÄÄ, ²Ä²Ä°ÄvÄézÄ zÄ¼ÄÄ²Ä½UÄ¼ÄÄ, °sÄgÄvÄ ²ÄÄvÄÄÛ «±ÄéPÉI PÄŁÄßqÄzÄ PÉÆqÄÄUÉUÄ¼ÄÄ E²ÄÄUÄ¼Ä°è PÉ®²ÄŁÄÄß DÄiÄÄÄÝ ¸ÄoÄ²Ä²ÄŁÄÄß gÄÆIÄÄ²ÄzÄÄ. PÄŁÄßqÄ ŁÄqÄÄ - ŁÄÄrAiÄÄ ŞUÉUÉ «zÄäyðUÄ¼Ä°è C©ü²ÄiÄŁÄ ²ÄÄvÄÄÛ UÉgÄ²Ä²ÄŁÄÄß °ÉaÑÄ²ÄÄ GzÉÝÄ±Ä F ¸ÄoÄ²ÄUÄ¼ÄVgÄÄvÄÛzÉ.

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 vÀªÀÄäCÉÀAvÀ ±ÀQÛUÀ¼À PÁgÀtPÁiV ªÀiÁvÀæªÀ®èzÉ ªÀÄÉÀµÀgÀ  
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 PÉÆiÄÖzÀtÁAiÀÄzÀOzÁAiÀÄð, vÉgÉzÀ ªÀÄÉÀ,ÀÄi,  
 GÉÀßwÀPÀgÀtzÀ°èAiÉÄÄ ÉÉiÖ zÀÈ¶Ö EAvÀÀ CÉÉPÀ PÁgÀtUÀ½UÁV  
 DPÁ±ÀªÀÉÀÄ ÉÀªÀÄª ªÀiÁzÀjUÀ¼À°è MAzÁVzÉ. NeÉÆÄxi ¥ÀzÀgÀPÉi  
 MzÁVgÀªÀªÀ DvÀAPÀªÀÇ ÉÄjzÀAvÉ DPÁ±ÀªÀÉÀÄß PÄjvÀ ªÉÉeÁÖªPÀ  
 ÉÉ-ÉUÀ¼ÀÉÀÆß ¥ÀoÀªÀªÀ M¼ÀUÉÆAqÀgÉ CzÀPÉÆiAzÀÄ  
 ,ÀªÀUÀævÉ 1UÀÄvÀÛzÉ. ÉÀPÀèvÀæ ªÀiÁ°PÉUÀ¼ÀÄ,  
 zsÀÆªÀÄPÉÄvÀUÀ¼ÀÄ, ªÀ¼É, ªÉÆÄqÀ, UÀÄqÀÄUÀÄ 1r®Ä EAxÀ  
 ¥ÀæxÀ«PÀ ,ÀAUÀwUÀ½AzÀ »rzÀÄ CzÀgÀ ªÀtðÉÁvÀäPÀ  
 «ªÀgÀUÀ½gÀªÀªÀ ¥ÀoÀªÀUÀ¼ÀÉÀÄß Dj1PÉÆ¼Àî§°ÄzÀÄ.

**WÀIPÀ -3 vÁgÀÄtª:** vÁgÀÄtªªÀ ªÀÄÉÀµÀª §zÀÄQÉÀ Cw DPÀµÀðPÀ,  
 ªuÁðAiÀÄPÀ PÁ-ÁªÀçüAiÀiÁVzÉ. F CªÀçüAiÀÄ°èÉÀ vÀ®ètUÀ¼ÀÄ,  
 DPÀµÀðUÉUÀ¼ÀÄ, D«ÀµÀUÀ¼ÀÄ ªÀÄAvÀzÀªÀªÀ Cw «²µÀÖªAvzÀÄY  
 CªÀÉÀ ªÀªQÛvÀé ªÀiÁUÀÄ«PÉUÉ vÀ¼À°ÀçAiÀiÁVgÀÄvÀÛzÉ.  
 °ÀÄqÀÄUÀnPE ªÀÄvÀÄÛ dªÀ-ÁYjUÀ¼À ÉÀqÀÄ«ÉÀ zÀéAzÀéUÀ¼ÀÉÀÄß  
 ªÀÄvÀÄÛ F CªÀçüAiÀÄ°èÉÀ M½vÀÄ-PEqÀPÀÄUÀ¼ÀÉÀÄß ,Á»vÀª  
 ˆsÁUÀUÀ¼À ªÀÄÄSÉÄÉÀ w½1PÉÆqÀªÀªÀzÀÄ. fªªÉÄzÀ  
 ªÀÄ°ÀvÀézÀWÀiÖªÀzÀ F CªÀçüAiÀÄ°èCªÀÉÀ ªÀÄÉÀ,ÀÄi ªÀiÁUÀÄªAvÀÛ  
 ZÀ°ÄªwÛzÀÄY PÀÉÀ,ÀÄUÀjPE, DzÀ±ÀðUÀ¼ÀÄ, ˆsªªÉÄUÀ¼ÀÄ,  
 °ÉÆÀvÀÉzÀ, °ÀÄqÀÄPÁi, iæAw ¥ÀæªAiÀÄUÀ¼À É¼ÉvÀ, ¥ÀæwˆsÉ  
 ªÀÄAvÀzÀªÀªUÀ¼À §UÉi CªÀÉÀÄß ªÀÄÆr,Àªª°è ,Á»vÀzÀ  
 ÉÉgÀªÀÉÀÄß w½1PÉÆqÀªÀªÀzÀÄ.

**WÀIPÀ -4 ÀAQÄtð:** vÁAwæPÀ «µÀAiÀÄUÀ¼ÀÉÀÄß PÀÉÀßqÀzÀ°è  
 gÀÆi,À-ÉÄPÀzÀ CUÀvÀävÉUÀ¼ÀÉÀÄß w½1PÉÆqÀªÀªÀzÀÄ EAçÉÀ  
 vÀAvÀæeÁÖÉÀ AiÀÄÄUÀzÀ°è CzÀPÉi CUÀvÀªªÀzÀ PÀÉÀßqÀªÀÉÀÄß  
 gÀÆi,ÀªªÀ vÀgÀ-ÉAw ªÄqÀªÀªÀzÀÄ. UÀtPÀ PÉèAvÀæzÀ°è  
 PÀÉÀßqÀªÀÉÀÄß ¥ÀjuÁªÀPÁjAiÀiÁV §¼À,ÀªªÀzÀPÉi  
 «zÀäyðUÀ¼ÀÉÀÄß ,ÀdÀÖUÉÆ½,ÀªªÀzÀÄ, UÀtPÀPÉèAvÀæPÉi  
 ,À§AçüˆzÀ vÁAwæPÀ «µÀAiÀÄUÀ¼ÀÉÀÄß GzÀ°ÀgÀuÉ E-ªÉÄÄ-ï,  
 PÀÉÀßqÀCAvÀeÁð® vÁtUÀ¼ÀÄ, PÀÉÀßqÀ vÀAvÀæA±ÀUÀ¼ÀÄ, PÀÉÀßqÀ  
 «QirAiÀiÁ ªÀÄAvÀzÀ ¥ÀjˆsÁµÉAiÀÄÉÀÄß PÀÉÀßqÀzÀ°è w½,ÀªªÀzÀÄ.

**Details of Course of Study: I and II Semesters**



Sem.	DisciplineCore/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
I	AECC: (L1-1): Sanskrit (3+0+0)	4	3	40	60
II	AECC: (L1-2): Sanskrit (3+0+0)	4	3	40	60

## I Semester Sanskrit

### Learning Objectives:

- ❖ It gives introduction to Sanskrit poetry.
- ❖ It inspires to read the Raghuvamsham Mahakavyam.
- ❖ It helps to build the foundation for Sanskrit vocabulary.
- ❖ It supports the formation of sentences in Sanskrit.
- ❖ It assists in comprehension skills.

### Learning Outcomes:

- The student gets motivated to compose poems.
- The student imbibes the noble qualities.
- The student develops conviction inscriptions.
- The student learns Sanskrit speaking skills.
- The student will be confident in learning new texts of Sanskrit.

## II Semester Sanskrit

### Learning Objectives:

- ❖ It gives introduction to Sanskrit prose.
- ❖ It inspires to read the complete BharataSangraha.
- ❖ It helps to gain the knowledge about various forms of nouns.
- ❖ It supports the formation of sentences in Sanskrit.
- ❖ It assists in translation skills.

### Learning Outcomes:

- The student gets motivated to make out similar works in Sanskrit literature.
- The student imbibes the noble qualities depicted in Sanskrit literature.
- The student acquires grammatical skills.
- The student learns Sanskrit speaking skills.
- The student will be confident in learning new texts of Sanskrit.

## Details of Course of Study: I and II Semesters

Sem.	DisciplineCore/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment	Semester End Examination
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		week		Marks (C1 + C2)	Marks (C3)
<b>I</b>	AECC: (L1-1): Hindi (3+0+0)	4	3	40	60
<b>II</b>	AECC: (L1-2): Hindi(3+0+0)	4	3	40	60

## **Ability Enhancement Compulsory Course (AECC)- ENVIRONMENTAL STUDIES**

### **Choice Based Credit System (CBCS) With Multiple Entries And Exit Options under New Education Policy (NEP) – 2020 (2021-22 Batch Onwards)**

#### **Details of Course of Study: I and II Semesters**

Sem.	DisciplineCore/ Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	AECC: Environmental studies (2+0+0)	3	2	20	30
<b>II</b>	AECC: Environmental studies (2+0+0)	3	2	20	30

### **I SEMESTER**

#### **Environmental studies**

##### **Course Objectives:**

- ❖ Environmental Studies (AECC) is made compulsory core module syllabus framed by UGC for all the Indian Universities as per the directions given by the honorable Supreme court, which believed that, conservation of environment should be a national way of life and to be inculcated into the education process. The committee proposes a staggered implementation for this course. This facilitates the distribution of the teaching workload of an institution.
- ❖ To ensure the interdisciplinary spirit of the proposed curriculum, teaching must be carried out by the faculty who are trained at post-graduate (M.Sc.) and Ph.D. in the 'Environmental Science subject only. A candidate who is qualified with UGC-NET/K-SET in the area of Environmental Science will be well-equipped to teach this curriculum.

### **Skill Enhancement Course (SEC)-DIGITAL FLUENCY**

**Choice Based Credit System (CBCS) With Multiple Entries  
And Exit Options under New Education Policy (NEP) – 2020  
(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	Skill Enhancement Course (Skill Based) Paper (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
I	SEC-1 (Skill Based): Digital Fluency (1+0+1)	1 +2	2	20	30
II	SEC-1 (Skill Based): Digital Fluency (1+0+1)	1 +2	2	20	30

**I and II SEMESTERS**

**SEC-1 (SKILL BASED): DIGITAL FLUENCY (THEORY/PRACTICAL):**

**2 Credits**

**15 +30 Hrs.**

**Course Outcomes:** At the end of the course the student should be able to:

Course outcomes are statements of observable student actions that serve as evidence of knowledge, skills and values acquired in this course. Have an intelligent conversation on the key concepts and applications of Artificial Intelligence (AI), Big Data Analytics (BDA), Internet of Things (IoT), Cloud Computing, and Cyber security.

- Develop holistically by learning essential skills such as effective communication, problem-solving, design thinking, and team work.
- Build his/her personal brand as an agile and expansive learner – one who is interested in horizontal and vertical growth.

**Open Elective Papers Across the Faculty for B.Sc. (Basic/Hons.),  
BCA (Basic/Hons.), BBA (Basic/Hons.), and B.Sc.  
(Basic/Hons.)/Integrated M.Sc. (Five Years) Degree in Molecular  
Biology Programmes**

**Choice Based Credit System (CBCS) With Multiple Entries  
And Exit Options under New Education Policy (NEP) – 2020  
(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	Open Elective Papers (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
<b>I</b>	OE-1: Human Rights (Political Science) (3+0+0)	3	3	40	60
	OE-2: Human Resources Management (Public Administration) (3+0+0)	3	3	40	60
	OE-3: Public Personnel Administration (Public Administration) (3+0+0)	3	3	40	60
<b>II</b>	OE-1: Indian Polity: Issues and Concerns (Political Science) (3+0+0)	3	3	40	60
	OE-2: International Relations (Political Science) (3+0+0)	3	3	40	60
	OE-3: Management of NGO's (Public Administration) (3+0+0)	3	3	40	60
	OE-4: State Administration (Public Administration) (3+0+0)	3	3	40	60

## I SEMESTER

**OE-1: HUMAN RIGHTS (THEORY):            3 Credits            45 Hrs.**

**Course Outcome:** This course aims to introduce the students to basic concepts and practices of Human Rights in the global and local domain. This course also exposes them to certain recent issues confronting the Human Rights debates.

**Learning Outcome:** After completing this course student will be able to;

- Explain the basic concept of Human Rights and its various formulations.
- Have necessary knowledge and skills for analyzing, interpreting, and applying the Human Rights standards and sensitize them to the issues.
- Develop ability to critically analyse Human Rights situations around them.

**OE-2: HUMAN RESOURCES MANAGEMENT (THEORY):            3 Credits            45 Hrs.**

**Objective:** To help students understand, appreciate and analyze work force at the managerial and non-managerial levels. The course also facilitates learning of various concepts, new trends and skills required for Planning, managing and development of human resources for organizational effectiveness.

**Learning Outcome:** At the end of the course the students shall;

- Understand the scope and importance of Human Resource Management.
- Develop ability to take appropriate decisions in Human Resource Management.
- Understand the process involved in the Recruitment, Training, Managing Discipline and Grievance.

**OE-3: PUBLIC PERSONNEL ADMINISTRATION (THEORY): 3 Credits 45 Hrs.**

**Objective:** This course will aim at creating awareness about the evolution and growth of the discipline. To make students learn about basic principles of Public Personnel Administration. and to give clarity of basic concepts.

**Learning Outcome:**At the end of the course the students shall;

- To explain the basic concepts of Public Personnel Administration.
- To know the methods of recruitment of Public Servants.
- Understand the Rights and Duties of Employee.

## II SEMESTER

**OE-1: INDIAN POLITY: ISSUES AND CONCERNS (THEORY): 3 Credits 45 Hrs.**

**Course Outcome:**To make the students aware on different issues that exists in Indian polity. Through this paper student need to understand the emerging issues and their causes to the Indian Democracy.

**Learning Outcome:**After completing this course student will be able to;

- Understand the reasons behind the causes of these issues and also the constitutional provisions that existed.
- Familiarize with the debates that emerged.
- Be able to suggest the measures to control such issues.

**OE-2: INTERNATIONAL RELATIONS (THEORY): 3 Credits 45 Hrs.**

**Course Outcome:**This course aims to introduce the students to basic concepts, Institutions and Issues of Global Politics. This course also exposes them to the Understanding OF Power Politics of Regional and Global level.

**Learning Outcome:**After completing this course student will be able to;

- Understand and reflect on basic concepts, Institutions and Issues of International Relations Global Politics.
- Develop and deepen the sense of Cosmopolitanism
- To acquire General knowledge for Competitive exam.

**OE-3: MANAGEMENT OF NGO'S (THEORY): 3 Credits 45 Hrs.**

**Course Objectives:**To acquire specific knowledge on NGO management. To understand the basic concepts and principles involved in managing NGOs. To understand the

Project Management Dimensions, Planning and its implementation. To enhance skills and techniques for Resource Mobilization.

**Learning Outcome:**After completing this course student will be able to;

- Learn the functions of NGO management along with its legal structure.
- Understand about Project management Dimensions, Planning and its implementation.
- Acquire the Skills and techniques of project evaluation / Resource Mobilization.

**OE-4: STATE ADMINISTRATION (THEORY): 3 Credits 45 Hrs.**

**Course Objectives:**This course will aim at creating awareness about the evolution and growth of the discipline. To make students learn about basic ideas of State Administration. And to give clarity of basic concepts.

**Learning Outcome:**After completing this course student will be able to;

- To explain the basic concepts of stateadministration.
- To know the working of stateadministration.
- To know the role played by different authorities in state administration.

**Open Elective Papers of Physical Education for B.Sc. (Basic/Hons.),  
BCA (Basic/Hons.), BBA (Basic/Hons.), and B.Sc.  
(Basic/Hons.)/Integrated M.Sc. (Five Years)Degree in Molecular  
Biology Programmes**

**Choice Based Credit System (CBCS) With Multiple Entries  
And Exit Options under New Education Policy (NEP) – 2020  
(2021-22 Batch Onwards)**

**Details of Course of Study: I and II Semesters**

Sem.	Open Elective Papers (L+T+P)	Teaching hours/ week	Credits	Internal Assessment Marks (C1 + C2)	Semester End Examination Marks (C3)
I	OE-1: Self Defence (1+0+2)	1 + 4	3	40	60
	OE-2: Sports Event Management (2+0+2)	2 + 2	3	40	60
	OE-3: Yoga and Fitness (1+0+2)	1 + 4	3	40	60
II	OE-4: Adventurous Sports (3+0+0)	1 + 4	3	40	60
	OE-5: Physical Fitness for	1 + 4	3	40	60

	Careers (3+0+0)				
	OE-6: Sports and Recreation (3+0+0)	1 + 4	3	40	60

### **Skill Enhancement Course (SEC)- PHYSICAL EDUCATION, YOGA, SPORTS**

#### **Choice Based Credit System (CBCS) With Multiple Entries And Exit Options under New Education Policy (NEP) – 2020 (2021-22 Batch Onwards)**

#### **Details of Course of Study: I and II Semesters**

<b>Sem.</b>	<b>Skill Enhancement Course (Value Based) Paper (L+T+P)</b>	<b>Teaching hours/ week</b>	<b>Credits</b>	<b>Internal Assessment Marks (C1 + C2)</b>
<b>I</b>	SEC-1: Physical Education and Yoga(0+0+2)	2	1	25
	SEC-2: Health and Wellness(1+0+1)	1+1	1	25
<b>II</b>	SEC-3: Physical Education and Sports(0+0+2)	2	1	25

#### **Outcome:**

All the above courses help in over all development of students.

Both mental and physical health status of students will be improved, this will help in the over all development.