Deccan Education Society's
Willingdon College, Sangli
Program Outcomes 2019-20

Name of the Program	Program outcomes
B. A.	• Students will realize the importance of Humanities and Languages. • Taken up independent creative writing or various aspects in literature, social, economic, political and environmental issues. • Develop reading, writing and communication skills of the students.
M. A.	• Emerged as a multifaceted personality who is self-dependent; earning his own bread and butter and also creating opportunities to do so. • Developed a flair for participating in various social and cultural activities voluntarily, in order to spread knowledge, creating awareness about the social evils, blind faith, etc. • Developed scientific outlook not only with respect to science subjects but also in all aspects related to life.
B. Sc.	• To nurture the scientific approach among the students. • To use the basics of science in daily life problems. • To make students aware about the environmental aspects.
M. Sc.	• To apply the knowledge of science in industries and in teaching. • To develop research interests among the students. • To enhance the sustainable development.
BCS	• Students are eligible to do jobs in IT sector. • Students can easily crack aptitude tests of renowned IT companies. • Students can appoint as database developer, software testing developer, technical support and front-end developer.

Principal

Principal,
Willingdon College, Sangli.

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Willingdon College, Sangli

Program Specific outcomes 2019- 20

Name of the Program	Program specific outcomes After successful completion of following programs students are able to:
BCS	• Students are eligible to do jobs in IT sector. • Students can easily crack aptitude tests of renowned IT companies. • Students can appoint as database developer, software testing developer, technical support and front-end developer.
B. Sc. Biotechnology	• Students get opportunity to work in various fields such as Agriculture, Medical, Environmental, Dairy, Pharmaceutical industries, Winery, Marine biotechnology, Bioinformatics as Technicians. • Officers in Quality Control and Quality Assurance, production, Research and Development Departments, Analytical Laboratories, Biofertilizers, Biopesticides etc. and students can set up their own biotech industry.
B.Sc. Botany	• Knowledge and understanding of: • The range of plant diversity in terms of structure, function and environmental relationships. • The evolution of plant diversity. • Plant classification and the flora of Maharashtra. • The role of plants in the functioning of the global ecosystem. • Intellectual skills – able to: • Transfer of appropriate knowledge and methods from one topic to another within the subject. • Plan, conduct and write a report on an independent term project. • Practical skills: Students learn to carry out practical work, in the field and in the laboratory, with minimal risk. • Interpreting plant morphology and anatomy. • Plant identification. • Vegetation analysis techniques. • A range of physiochemical analyses of plant materials in the context of plant physiology and biochemistry. • Analyze data using appropriate statistical methods and computer packages. • Plant pathology to be added for sharing of field and lab data obtained.

	• Transferable skills: • Use of IT (word-processing, use of internet, statistical packages and databases). • Ability to work as part of a team. • Ability to use library resources. • Time management. • Career planning. • Scientific Knowledge: • Apply the knowledge of basic science, life sciences and fundamental process of plants to study and analyze any plant form. • Design/development of solutions: Design solutions from medicinal plants for health problems, disorders and disease of human beings and estimate the phytochemical content of plants which meet the specified needs to appropriate consideration for the public health • Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern instruments and equipments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations. • Environment and sustainability: Understand the impact of the plant diversity in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. • Ethics: Apply ethical principles and commit to environmental ethics and responsibilities and norms of the biodiversity conservation.
B.Sc. Chemistry	• Students should understand the analytical techniques in chemistry. • Students possibly will understand the applications of chemistry self-employment such as in small scale or large scale of some domestic chemicals industries such as phenyl, sanitary acids, liquid soaps, cold creams etc. • Students can acquire basic knowledge separation science and solvent extractions • Improvement in the basic knowledge of preparation of dyes & drugs and their applications in everyday life. • Students acquire the knowledge of extraction some natural drugs, pigments and they are environmentally friendly keeping green approach in mind. • Understand the impact of the chemicals in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.
M.Sc. Chemistry	• Students are able to handle the equipment like NMR,

	IR, UV, HPLC, GC, AAS etc. • Students acquire the knowledge of extraction some natural drugs, pigments and they are environmentally friendly keeping green approach in mind. • Understand the impact of the chemicals in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.
B.Sc. Electronics	• To provide opportunities to the students to acquire sound knowledge of electronics science and technology. • To provide opportunities to students to learn the latest trends in electronics. • To provide opportunities to students to become researchers and developers to satisfy the needs of core electronics industries. • To provide opportunities to students to formulate, analyze, solve real life problems faced in electronics industry. • Understand the current voltage characteristics of semiconductor devices, and various instruments. • The operation of various circuits and analysis and working of device will help them to design the standard application. • Communication Electronics will help to understand and develop the various communication techniques used in the day to day life and some advance communication will explore the new world. • Industrial Electronics will help to understand the devices operation and use in the process control. • To describe architecture of 8051 and ARM7 microcontroller as well as Interface various peripheral. • Learn to design and fabricate the various electronics devices and fault finding as well as repairing. • Every electronics student will get confidence in using the Electrical as well as Electronics devices as he knows the basics of the working of various components used in the system.
B. Sc. Computer Science	• To provide opportunities to the students to acquire computer knowledge of latest software & hardware technology. • To provide opportunity to students to learn the latest trends in Computer Science. • To provide opportunities to the students to develop different software's using computer programming languages. • To provide opportunities to the students to formulate analyze and solve real life problems faced in IT Industry.
B. Sc. Mathematics	• On completion of B.Sc. Degree in Mathematics the

	students are equipped with basic concepts of Mathematics and in addition they are introduced to basics of Analysis and Algebra. with this knowledge they will be able to teach Mathematics up to 10th Standard by augmenting their skills of teaching they can appear for competitive exams for investigator in central and state governments, Statistical officer, Banking, LIC, MPSC, UPSC, etc.
M. Sc. Mathematics	• On completion of this course students can go for research in Mathematics as well as Computer Science, Data mining, Data Analysis and also in R and D departments of various companies and research laboratories of course one can opt for teaching profession. All the competitive examinations listed above are open for M.Sc. Students. Because of the sound logic they can be good software developers.
B. Sc. Microbiology	• Students get opportunity to work in various field as- Agriculture, Medical, Environmental, Dairy, Pharmaceutical industries as Technicians, Officers in Quality Control and Quality Assurance, production, Research and Development Departments, Analytical Laboratories, Biofertilizers, Biopesticides etc.
B. Sc. Physics	• To inculcate the scientific temperament among the student. • To provide opportunities to the students to acquire knowledge of Physics. • To develop analytical thinking about any situation. • To use basic science for the development of mankind.
B. Sc. Statistics	• To motived the students for data analysis data mining and their applications in industries and real-life situations. • Use of R- software. M.S. Excel, to solve problems related to fitting of distribution, random sampling, data analysis & graphical representation of data set-in real-life situations. • Statistics has wide applications in every walk of life. As per the interest of students they are guided to develop their interest in applied fields and also in research. • To enable the students to flourish in society with knowledge of subject and its application.
B. Sc. Zoology	• Apply knowledge about animal identification to study biodiversity with scientific classification, phylogeny and evolutionary relationship of major groups of invertebrate and vertebrate animals. • Correlate physiology, toxicology, endocrinology, medical zoology, biostatics, applied zoology, environmental biology with their life and work. • Carry out laboratory techniques ESR, DNA isolation,

	RBC, WBC count, Hb detection, estimation of protein, sugar, lipid, uric acid etc. • Understood biotechnological techniques, molecular biology, developmental biology, comparative anatomy, enzymology and biochemistry. • Get opportunity in post-graduation, jobs in sericulture, malaria, fisheries, forest, forensic, agricultural entomology departments, dairy industries, pathological laboratories, genetic engineering, bioinformatics etc. • Entrepreneurships in poultry, Emu, Goat farming, sericulture, apiculture, vermiculture, dairy etc.
B. A. English	• Understand minor and major forms of English Literature. • Know the literary theories, ter.ms and concepts in Criticism. • Understand the structure and function of grammatical units. • Use English effectively in formal and informal situations. • Develop linguistic competency
M. A. English	• Get cognizance of the structural, economic, and psychoanalytical perspectives to the literatures produced and also translated into English. • Know the conventions of diverse textual genres (e.g., the fiction, poetry, novel, drama, novel, memoir etc. with the help of texts prescribed. • Think and write creatively and critically and will be able to interpret any piece of writing. • Apply critical frameworks to analyze the linguistic, cultural and historical background of texts written in English.
B. A. Economics	• Understand the nature of Indian Economy, banking and planning system in India. • Distinguishes between micro and macro economics • Acquaintance of research methods in economic analysis • Understand economic relations of India with other countries •
M. A. Economics	• Understand micro and macroeconomic policy. • Knowledge of Indian public finance, Indian agriculture, cooperation. • Acquaintance of resources and ecology. • Acquired knowledge of using statistics to economic analysis. • Understand international trade policies.
B. A. Geography	• It provides opportunity to students to acquire sound knowledge of Geography and recent technology used in Geography.

	• Students understand relationship between man and nature, conservation of ecosystem, unity in diversity; Climatic changes. • Students acquire skill of map reading, cartographic techniques and knowledge of statistical techniques, surveying, GIS for solving real world problem and get opportunity to serve in GIS companies. • Students learn the concept of Physical Geography; Crust and related theory, denudation agents, Human Geography; culture, population and settlement; distribution, soil problems, conservation and management, agriculture systems, Oceanography, Physical, Economical Geography of India.
B. A. Hindi	• छात्रों को रोजगार उपलब्ध कराना तथा हिंदी साहित्य के प्रति रुचि बढ़ाना| • छात्रों को हिंदी में कार्य करने की विचार क्षमता, कल्पनाशीलता विकसित कराना| • हिंदी साहित्य की विविध विधाओं से छात्रों को अवगत कराना|
M. A. Hindi	• छात्रों को मानक हिंदी भाषा से परिचित कराना| • छात्रों को प्रतियोगिता परीक्षा के लिए तैयार कराना| • छात्रों को हिंदी भाषा की उपयोगिता तथा महत्त्व से परिचित कराना|
B. A. History	• To get Past Knowledge of Human history, Religion, Culture. • Preparation for MPSC and UPSC Exams. • To the Students about the opportunity in archaeology department. • To get Knowledge about Maratha history and Indian history and world history.
B. A. Marathi	• To provide opportunities to the students to acquire sound knowledge of Marathi Literature and Language. • To provide opportunity to students to learn the latest trends in Marathi. • To provide opportunities to the students to become researchers and developers to satisfy the needs of the core Marathi Language and Literature. • To provide opportunities to the students to formulate, analyze and solve real life problems faced in Humanities.
M. A. Marathi	• Theories and approaches to language and literature studies. • Marathi Literature: Study of development and genesis of literature. • Study of various branches and types of ancient, medieval and early literature. • Prose literature: Ancient, medieval and modern Genres in Marathi literature, Study of various trends in and

	influences on literary study.
B. A. Sanskrit	• The Program is designed to give general introduction of width and depth of Sanskrit subject to students. • The program helps developing language skills in the Sanskrit subject and adds values to the personality of Student. • It makes students competent to face further entrances for higher education in Sanskrit Language.
M. A. Sanskrit	• The M. A. Program is designed to give all-inclusive insight of the Sanskrit subject to students. • The program deals with Vedic literature, Grammar, Philosophy, Drama, linguistics and Ayurveda • It makes students competent and versatile to face the competitive exams and to expertise confidently in their chosen field of Sanskrit Language.

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Deccan Education Society's
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Department wise Course Outcomes 2019 -20

Department of Computer Science (Optional)

Program Name	Course Name/ paper	Course Outcome By the end of each of the following course, the students will be able to:
B. Sc. I	Paper I and III DSC-11A and DSC-11B Problem solving using computers	• How to design algorithms and flowcharts, basic knowledge of programming and logic development.
	Paper II DSC-12A DBMS	• How to collect data, how to retrieve, modify and delete data, how to avoid duplicate data.
	Paper IV DSC-12B RDBMS:	• Relational Database Management System in that student get create the database using queries and form some operation on that database like crate table, select data from that table, modify table data, and programmers using PLSQL blocks.
	Paper-I Computer Science Practical Paper Based on DSC-11A and DSC-11B DSC-12A and DSC-12B	• Students can get the knowledge about basic computer programming language and database management system.
B. Sc. II	Paper V- DSC-11C PHP	• Hypertext pre-processor, in that you can create dynamic websites, connectivity with my-sql server. • It is server-side scripting language, learn HTML for designing.
	Paper VI DSC-12C C++	• Students get the idea of creating classes and objects the basics of oops. The initialization & declaring the object with constructor and destructor. Inheritance chapter lets to know about reusing classes. Polymorphism is used to run time binding.
	Paper VII DSC-12D Data Structure	• Understand the basic concepts such as Abstract data types, liner and non-liner data. Able to analyses and implement various kinds of searching and sorting techniques.
	Paper VIII DSC-11D Cyber security	• To create awareness about cybercrimes.
	Practical Paper-II Based on DSC-11C	• Students can identify Hypertext pre-processor, in that they can create dynamic websites, connectivity with using My-Sql

		database server. It is server side scripting language, learn HTML for designing
	Practical Paper-III Computer Science Practical Paper Based on DSC-12CandDSC-12D	• Students can develop object-oriented programming approach and enhance to design, implement, and evaluate a computational system to meet desired needs within realistic constraints.
B Sc. III	Paper IX Networking and windows server 2008	• Basics of hardware and networking, sharing resources, LAN connectivity, and how to use windows server 2008.
	Paper X C#	• How to build the software, connectivity with SQL database, programming in console application, designing of windows and web applications.
	Paper XI Linux	• How to use operating system, it is command line interface, how to perform commands on that operating system, printer management commands, and programing that is shell scripts in vi editors.
	Paper XII PHP	• Hypertext pre-processor, in that you can create dynamic websites, connectivity with my-sql server. It is server side scripting language, learn HTML for designing
	Paper XIII Networking and windows server 2008	• Basics of hardware and networking, sharing resources, LAN connectivity, and how to use windows server 2008.
	Paper XIV Java	• Student learn covers software design, introducing object oriented programing design techniques and problem solving.
	Paper XV Linux	• How to use operating system, it is command line interface, how to perform commands on that operating system, printer management commands, and programing that is shell scripts in vi editors
	Paper XVI PHP	• Hypertext pre-processor, in that you can create dynamic websites, connectivity with my-sql server. It is server-side scripting language, learn HTML for designing.
	Practical Paper – IV Based on Paper No. IX, X, XIII and XIV.	• Acquire a good knowledge of the computer network, its architecture and operation; understand and apply the principles and practices of computer networks. • To understand object-oriented programming concepts, and apply them in solving Problems.
	Practical Paper – V Based on	• Students can understand the basic commands of Linux operating system and can write shell scripts

	Paper No. XI, XII, XV and XVI.	• Students can create file systems and directories and operate them; Students will be able to create processes background and fore ground etc.
	Practical Paper – VI Major Project work done by the student.	• Students can learn software designing process using appropriate techniques, skills, and tools necessary for developing computer application (software). • An ability to apply design and development principles in the construction of software systems of varying complexity.

Department of Electronics

Program Name	**Course Name/ paper**	**Course Outcome** **By the end of each of the following course, the students will be able to:**
B. Sc. I	Paper I NETWORK ANALYSIS AND ANALOG ELECTRONICS	• Course Outcomes: By the end of this course, the students will be able to: • Identification of passive and active electronic components. • Analyzing the different passive networking and understanding the network theorems. • Understanding of Two port networks theory for semiconducting devices. • Construction and working of Basic electronic Components such as Diode, Photodiode, Zener Diode, LED etc. Working of the rectifiers and filters in power supplies.
	Paper II DIGITAL INTEGRATED CIRCUITS	• Understanding the concept of digital electronics • Use of various number system in Digital Electronics • Analyzing the digital circuits and Boolean algebra • Combinational logic analyses and design of the circuit • Construction and working of arithmetic circuits • Construction and working of Data processing circuits such as Multiplexer Demultiplexer Encoder and Decoder and applications.
	Paper III NETWORK ANALYSIS AND ANALOG ELECTRONICS	• Describe Working, characteristics and applications of BJT. • Analyze the semiconductor device for the various applications such as amplifier or switch

		• Understanding of the different parameters of the amplifier design • Design aspects and Classifications of the amplifiers. • Need and design aspect of the cascade amplifier • Working and Design of the oscillator for particular frequency • Construction working and Use and application of the Unipolar junction transistor
	Paper IV LINEAR AND DIGITAL INTEGRATED CIRCUITS	• Understanding working of the combinational logic • Understanding of the sequential circuits and working of the same • Working and designing of the different type of counters • Working data conversion techniques ADC and DAC with different technologies • Understanding of the Opamp as the basic building block in analog electronics • Construction and designing of the different Opamp applications • IC-555 construction, working and applications
	Practical Course I - Analog Circuits	• Students understood good laboratory practices, of Basic electronic and analog circuits. • Small analog circuits help to enhance the skills in Electronics.
	Practical Course II – Digital Electronics	• Students acquired laboratory skills and techniques digital circuits. • Industrial digital technique learning helps in design of circuits.
B. Sc. II	DSC 9C Paper V: Communication Electronics	• Understanding the need of electronic communication • Basic building blocks of the communication system • Rules and regulation laid by TRAI • Working of the different modulation techniques • Satellite communication system • Working of the geolocation services like GPS
	DSC 9D Paper VI: Introduction to Microprocessor 8085	• Understand the basic computer organization and working • Working of the different blocks of the 8085 microprocessors

		• Instructions and programming of the 8085 microprocessors • Concept of embedded systems and introduction to microcontroller 8051 • Use and Working of the different registers inside 8051 microcontrollers
	DSC 10C: Paper VII: Digital Modulation and Mobile telephone System	• Working and building blocks Digital modulation techniques like PAM, PWM and PPM • Digital modulation ASK FSK and PSK • Structure Mobile telephony networking • Essential elements for the mobile telephony networking • Concept of 2G, 3G and 4G Mobile Generations
	Paper VIII DSC 10D: 8051 Microcontroller and Embedded System	• Working instruction set of the 8051 microcontrollers • Use of the facilities in 8051 • Interfacing simple devices and developing the program for the same • Writing program using Embedded C • Developing program for small applications
	Practical Course III –	• Group A Experiments to be performed using hardware/ software for analog circuits • Students perform Programs using 8085 Microprocessor.
	Practical Course IV –	• Students learnt the techniques for Experiments using 8051 microcontrollers • Skill enhancement experiments helps in daily life instruments and applications • Industrial visit will also help to motivate the students to develop the skill of design and develop the electronic devices.
B Sc. III	Paper IX Linear Integrated Circuits	• Opamp as building block in analog electronics • Different important parameters in design in the Opamp and different IC of Opamp • Designing and working of the different applications of the Opamp • Designing of the active filters and precision rectifier • Working of the phase lock loops and power supplies.
	Paper X Communication Systems -I	• Understanding the need of electronic communication. • Basic building blocks of the communication system. • Rules and regulation laid by TRAI

		• Working of the different modulation techniques. • Satellite communication system • Working of the TV receiver color and black and white. • Working of different working technologies
	Paper XI 8051 Microcontroller Interfacing and Embedded C	• Working instruction set of the 8051 microcontrollers • Use of the facilities in 8051 • Interfacing simple devices and developing the program for the same • Writing program using Embedded C • Developing program for small applications
	Paper XII Power Electronics Devices and applications	• Importance of power electronics in industrial sector • Construction and working of semiconducting devices used in power electronics • Design and working of controlled and uncontrolled rectifier • Design and working of Single-phase AC controllers
	Paper XIII Industrial Process Control and PLC Programming	• Understanding of basic control theory • Working different control mechanisms in industrial process control • Hardware elements working in a control system • Developing a ladder programs for basic applications
	Paper XIV Communication Systems -II	• Working of telephone communication system and exchange • Working of the ISDN and satellite communication • Digital modulation techniques like ASK FSK PSK • Working of wireless communications and different protocols like Bluetooth, zigbee, RFID etc
	Paper XV-Advanced Microcontroller Architecture PIC	• Working of registers of PIC microcontrollers • Instructions of the 18F series microcontroller • Working of the internal registers • Building a program for small applications
	Paper XVI Electronic Instrumentation	• Understand the basic principle of the different sensors and transducers • Working of different transducers for measurement of physical quantities

		• Design aspect of the signal conditioning circuits for sensors • Understating the working Measuring and recoding elements such as display plotters etc.
	Practical Course I – Sensors and measuring devices skill techniques	• Students acquired measuring devices and sensors. • Measurement of various parameters and its applications in various fields.
	Practical Course II – Communication	• Students learnt techniques various communication Techniques • Use of Digital devices in communication • Learning Experimental communication using the advanced remote devices.
	Practical Course III – Microcontroller Interfacing	• Students developed skills and techniques Interfacing of Microcontroller and its applications. • Industrial applications with 8051 Microcontroller and PIC microcontroller.
	Practical Course IV – Power Electronic Devices	• Students developed skill and techniques for Different power devices and its working. • Students acquired practical skill for determination the characteristics of power devices.

Department of Botany

Program Name	**Course Name/ paper**	**Course Outcome** **By the end of each of the following course, the students will be able to:**
B. Sc. I	Paper I: DSC 13 A: Biodiversity of Microbes, Algae and Fungi	• Understand the diversity among Viruses, Bacteria, Algae, fungi. • Know the systematic, morphology and structure, of Viruses, Bacteria, Algae, fungi. • Understand the useful and harmful activities of Viruses, Bacteria, Algae, fungi. • Understand the morphological diversity of Bryophytes. • Understand the economic importance of the Bryophytes.
	Paper II: DSC14 A: Biodiversity of Archegoniate- Bryophytes, Pteridophytes and Gymnosperms	• Understand the morphological diversity of Bryophytes, Pteridophytes, Gymnosperms. • Know the systematic, morphology and structure, Bryophytes, Pteridophytes, Gymnosperms.

	Paper III: DSC 13B: Plant Ecology	• Understand the ecological factors and adaptations. • To know the different plant communities and succession. • Understand the different ecosystems.
	Paper IV: DSC 14B: Plant Taxonomy	• Understand the different terms in taxonomy, ICBN nomenclature and different families.
	Practical Paper	• Learn the microscopic technique. • To study and get knowledge about parts and working principles of compound and dissecting microscope. • Students are capable to become practical knowledge about micro-preparation and observation of permanent slides of genera. • Laboratory experiments will be helpful to student for better understanding of the scientific principles and skillful implementation of the experiments. • Develop the skill for micro slide preparation and understand the internal structure of algae, fungi, bryophytes, Pteridophytes, Gymnosperms. • Learn the external and internal structure of lower and higher group organisms.
B. Sc. II	Paper V: DSC C13: Embryology of Angiosperms	• Understand the structural organization of flower. • To know the fertilization process, embryo and endosperm development.
	Paper VI: DSC C14: Plant Physiology	• Know importance and scope of plant physiology. • Understand the plants and plant cells in relation to water. • Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways. • Learn about the movement of sap and absorption of water in plant body. • Understand the plant movements.
	Paper VII: DSC D13: Plant Anatomy	• To know the organization of higher plants. • Understand the primary and secondary structure of plant boy.
	Paper VIII DSC D14: Plant Metabolism	• Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration. • Structure and general features of enzymes.

		• Concept of enzyme activity and enzyme inhibition. • Understand the process of Nitrogen metabolism.
B.Sc. II Plant Protection	Paper I: DSC IC 45: Major crops and methods of Integrated Plant Protection	• To study the crops with their morphology, soil, field preparation, varieties, cultural practices, fertilizers, different diseases and economic importance • To know general methods of plant protection such as cultural method, mechanical method, physical method, chemical method and biological method
	Paper II: DSC IC 46: Insect Pests and their Management	• To know about the scientific name, marks of identification, life cycle, nature of damage and management of insect pests. • To study principles of insect pest control and recent trends in pest management.
	Paper III: Introduction to Weeds and Weed Management	• To know definition, classification, reproduction and dispersal of weeds • To study different methods of weed management • To know working of hand refractometer • To know different laboratory techniques
	Paper IV: Crop Diseases, Their Management and Pathophysiological skills.	• To study the crop diseases with their symptoms, pathogen, disease cycle and management • To know management of crop diseases by mechanical and chemical method • To know pathophysiological skills used in different techniques.
	Practical Paper	• Student will enlighten regarding plant habitats and its morphological & anatomical features by micro preparation technique. • Study of morphological and anatomical adaptation in hydrophyte and Xerophyte. • To enable the student for quantitative estimation of water & soil samples from different environment • To gain knowledge of various vegetative and floral characters, taxonomic families and their useful parts of plants. • To gain the knowledge of various meteorological instruments.
B Sc. III	Paper IX: Biology of Non vascular Plants and Paleobotany	• Understand the diversity among Algae. • Know the systematic, morphology and structure, of Algae. • Understand the life cycle pattern of Algae.

		• Understand the useful and harmful activities of Algae. • Understand the Biodiversity of Fungi • Know the Economic Importance of Fungi • Understand the morphological diversity of Bryophytes. • Understand the economic importance of the Bryophytes. • Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes. • Know the scope of Paleobotany, types of fossils, its role in global economy and geological time scale. • Understand the various fossil genera representing different fossil groups.
	Paper X: Genetics and Analytical Techniques in Plant Science	• Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material. • Understand the process of synthesis of proteins and role of genetic code in polypeptide formation. • Know the details of Microscopy- Principles of light microscopy, electron microscopy (TEM and SEM). • Understand & perform Chromatography and cultural techniques in Botany. • Understand the methods used in Micrometry, Microtomy and Microphotography.
	Paper XI: Fundamentals of Plant Physiology and Ecology	• Learn and understand about mineral nutrition in plants. • Understand the growth and developmental processes in plants. • Know about Photosynthesis and Respiration in plants. • Understand the process of translocation of solutes in plants. • Know the nitrogen metabolism and its importance.
	Paper XII: Plant Biochemistry	• Understand the properties of Monosaccharides, Oligosaccharides and Polysaccharides. • They will learn about the Significance of Carbohydrates. • Understand the Properties of saturated fatty acids, and unsaturated fatty acids. • Understand lipid metabolism in plants.

		• Understand the Beta Oxidation, Gluconeogenesis and its role in mobilization of fatty acids during germination. • They will learn about the Significance of lipids. • They will be able to understand Brief outline of biosynthesis of amino acid. • Understand the protein - structure and classification and protein biosynthesis in prokaryotes and eukaryotes. • They will learn about the nucleic acid metabolism.
	Paper XIII: Biology of Vascular Plants	• Understand the diversity of Gymnosperms in India. • Know the evolutionary trends and affinities of living gymnosperms with respect to external and internal features. • Know the conceptual development of taxonomy and systematics • Understand the Phylogeny of angiosperms -A general account of the origin of Angiosperms. • Understand the general range of variations in the group of angiosperms.
	Paper XIV: Microbiology and Plant Pathology	• Understand the concept, principle and types of sterilization methods. • Know the concept and characteristics of antiseptic, disinfectant and their mode of action. • Know the cultivation methods of bacteria, yeast, fungi and virus. • Principle, working and applications of instruments viz, pH meters, spectrophotometer, centrifuge, viscometer, and laminar air flow. • Understand the Microbial Genetics and Recombination in Bacteria.
	Paper XV: Plant breeding, Biostatistics, Ethnobotany and Horticulture	• Understand the science of plant breeding. • To introduce the student with branch of plant breeding for the survival of human being from starvation. • To study the techniques of production of new superior crop verities. • Understand the modern strategies applied in Genetics and Plant Breeding to sequence and analyze genomes • Get the detail knowledge about modern strategies applied in Plant Breeding for

		crop improvement i.e. Mass selection, Pure line Selection and Clonal selection.
	Paper XVI: Molecular Biology and Biotechnology	• Know about the genomic organization or living organisms, study of genes genome, chromosome etc. • Gain knowledge about the mechanism and essential component required for prokaryotic DNA replication. • Understand the fundamentals of Recombinant DNA Technology. • Know about the Genetic Engineering. • Understand the principle and basic protocols for Plant Tissue Culture. • The concept of operon and its structure and regulation.
	Practical Paper - I	• Learn the external and internal structure of lower and higher group organisms. • Learn Algae, fungi, Bryophyte, Pteridophyte, Gymnosperms with respect to vegetative, reproductive structures and classification with reasons • Develop the skill for micro slide preparation and understand the internal structure of algae, fungi and bryophytes, Pteridophyte, Gymnosperms • Expertise in media preparation, sterilization, isolation and identification of Fungi. • Learn plant diseases, causal organisms, and control measures • Students get knowledge in fossil and fossilization.
	Practical Paper - II	• Study of the families with respect to morphological characters using botanical terms, floral formula, floral diagram and classification. • Identification of genus and species with the help of flora, of the plant materials • Students should understand, Study of epidermal tissue system and mechanical tissue system, Secretary tissue system. • Students are capable to become practical knowledgeable in estimation of plant pigments by paper chromatography methods. • The students will understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways, CAM

		pathways • Students should understand the RQ using Ganong's respirometer, • Practically students able to find out the ecological parameters such as plant species distribution, abundance and density in a defined area by quadrat method. • Students will be able to gain knowledge on estimation of dissolved oxygen content, chloride content, carbonate and bicarbonate in water and total dissolved solids and hardness in solid, free CO2, Chloride, total alkalinity.
	Practical Paper - III	• The laboratory courses help the student to understand and learning principles of laboratory • Students are able to learn to solve various genetic problems. Working out problems related to genetics will be helpful to students, to solve the problems in plant biology. • Students are able to learn the Mitosis and Meiosis techniques, abnormalities • To study the principle and working and uses of Microtomy, microphotography, Micrometry techniques. • Students are capable to acquaint practical knowledgeable in qualitative tests in starch, sugars, lipids and proteins. • To acquire knowledge in the preparation of herbarium techniques. • Students will be able to understand the practical difficulties in the isolation of plant genomic DNA.
	Practical Paper - IV	• Students learn about the techniques of emasculation, crossing and bagging. • Statistical methods for biological sciences. • To know about plant tissue culture media preparation. • In plant tissue culture practical, students will be able to learn the laboratory techniques such as washing, storage of glassware, plastic ware, preparation, sterilization and storage of nutrient media. • To understand the economic importance of plants. • To understand Nursery techniques • learn about PPT making and impressive presentation

Department of Chemistry

Program Name	Course Name/ paper	Course Outcome By the end of each of the following course, the students will be able to:
B. Sc. I	Paper I: DSC-3A Inorganic Chemistry	• Basic concepts regarding nature of chemical bonds. • Chemical bonding according to VBT and MOT
	Paper II: DSC-4A Organic Chemistry	• Understanding the stability of compounds on the basis of aromaticity. • Basic knowledge of reactive intermediates.
	Paper III: DSC-3B Physical Chemistry	• Basic concepts of Thermodynamics and Chemical Kinetics. • Entropy and enthalpy of chemical system.
	Paper IV: DSC-4B Analytical Chemistry	• Basic skills of various analytical unit operations.
	Practical course part- I for sem I and II	• Study of eudiometer, viscometer. • Chemical kinetics and reaction rates. • Organic qualitative analysis. • Organic estimations, chromatographic techniques.
B. Sc. II	Paper V: DSC- C3 Physical Chemistry	• Understand functioning and construction of Electrochemical cell. • Knowledge about surface tension, viscosity and refractive index will be gained by the student. Learning and understanding of surface phenomenon. • Learning the various Nuclear phenomena and measurement of nuclear radiations. • Learning and understanding the knowledge about third order reaction and theories of reaction rates.
	Paper VI: DSC- C4 Industrial Chemistry	• Learning and Understanding basic concepts and concentration terms. • Distinguish between classical and industrial chemistry • Distinguish between unit operations and unit processes • Chemical constitution in soap and detergents and its applicability • Concepts of corrosion and electroplating in metals • Basic concepts of industrial operations. • Knowledge about cleansing properties of soap and detergents. • Protection of metals, electroplating.

	Paper VII: DSC- D3 Inorganic Chemistry	• Understanding the basics of coordination chemistry. • Understand the theory of chelation • Study of ‘p’ block and ‘d’ block elemental compounds. • Understand qualitative analysis of inorganic mixtures
	Paper VIII: DSC- D4 Organic Chemistry	• Stereochemical aspects of organic compounds. • Properties and reactivity of carbonyl compounds, amine, diazonium salts. • To impart knowledge about the synthesis, reactivity and applications of carboxylic acids. • Understanding the classification, configuration and structure of carbohydrates.
	Practical course part-II for sem III and IV	• Understand the analytical techniques like gravimetric, titrimetric estimations. • Semi micro qualitative analysis. • Organic qualitative analysis. • Study of conductometer, viscometer, stalagmometer etc.
B Sc. III	Paper IX Physical Chemistry	• Quantum theory and its applicability in chemistry. • Elucidation of structure of chemical compounds by studying the spectroscopic techniques.
	Paper X Inorganic Chemistry	• Detail study of organometallic compounds and semiconductors. • Applicability and hazards of various polymers
	Paper XI Organic Spectroscopy	• Elucidation of structure of various organic compounds by using UV-VIS, IR, NMR and Mass spectroscopic techniques
	Paper XII Industrial Chemistry	• Understanding of different chemical processes in industry.
	Paper XIII Physical Chemistry	• Radioactivity of various elements and its usefulness. • Rate of simultaneous reactions can be studied by chemical kinetics.
	Paper XIV Inorganic Chemistry	• Radioactivity and its applications in various field. • Kinetic and thermodynamic stability of complexes.
	Paper XV Organic Chemistry	• Reaction mechanism and industrial applicability of various name reactions and reagents. • History and chemistry of Natural products

		and its pharmaceutical applications.
	Paper XVI Analytical Chemistry	• Chromatographic techniques for chemical analysis. • Applicability of various instruments like Potentiometer, conductometer, etc.
	Practical course part-III for sem V and VI	• Understand the analytical techniques like gravimetry, titrimetric and inorganic preparations. • separation of binary organic mixtures • Organic qualitative analysis. • Study of conductometer, potentiometer, pH meter, refractometer, viscometer, colorimeter, stalagmometer etc.
	Paper I: CC-101 Inorganic Chemistry	• To study properties of transition metals. • To study the coordination compounds and their applications • Understand the properties and applications of metal carbonyls.
	Paper II: CC-102 Organic Chemistry	• To understand organic reactions mechanisms and basics of stereochemistry. • Students can learn about the concept of aromaticity and aromatic electrophilic and nucleophilic substitution reactions.
	Paper III:CC-103 Physical Chemistry	• Aware with the phenomenon of thermodynamics and macromolecular chemistry. • Students can understand the concepts of reaction kinetics.
	Paper IV: CC-104 Analytical Chemistry	• To study basic analytical concepts and methods of analysis. • Students will aware with instrumentation.
	Practical Course CHP-I	• Understand the basics of ore and alloy analysis. • Study the preparation techniques and quantitative estimations,
	Practical Course CHP-II	• Understand the use of conductivity meter, potentiometer, pH meter. • Study kinetics of reactions.
	Paper V: CC-201 Inorganic Chemistry	• To understand the applications of non-transition elements and their compounds. • Students will understand the concepts of semiconductors and its applications.
	Paper VI: CC-202 Organic Chemistry	• Study of photochemistry and organometallic compounds • Oxidation and reduction reagents and processes.
	Paper VII: CC-203 Physical Chemistry	• Understand the concept of quantum chemistry and electrochemistry.

	Paper VIII: CC-204 Analytical Chemistry	• Structure elucidation using different spectroscopic techniques.
	Practical Course CHP-III	• Understand the basics of ore and alloy analysis. • Study the preparation techniques and quantitative estimations. • Qualitative analysis of binary mixtures.
	Practical Course CHP-IV	• Understand the use of conductivity meter, potentiometer, pH meter, colorimeter. • Study kinetics of reactions and reactions rates.
M.Sc. II SEM I	Paper IX: Organic reaction Mechanism	• Study & implementation of reaction mechanism via various pathways. • Basics of mechanistic path of various reactions. • Understanding of the concepts of pericyclic reactions and free radical reactions.
	Paper X: Advanced Spectroscopic Methods	• Elucidation of structure of various organic compounds by using UV-VIS, IR, NMR and Mass spectroscopic techniques.
	Paper XI: Advanced Synthetic Methods	• Detail study of various catalysts for their synthetic utility & their roll in retrosynthetic approach.
	Paper XII: Drug & heterocycles.	• Study of synthesis of some important drugs. • Synthesis & application of industrially important heterocyclic compounds.
	Practical Course OCHP- V	• Understand the concept of separation, purification and identification of ternary mixtures.
	Practical Course OCHP- VI	• Understand the basics of two step organic preparations.
M.Sc. II SEM II	Paper XIII: Theoretical Organic Chemistry.	• Detail study of Theoretical Organic Chemistry. • Study of green chemical synthesis and sustainable development.
	Paper XIV: Stereochemistry.	• Study of stereo chemical aspects, their effects on organic synthesis & their properties.
	Paper XV: Chemistry of Natural Products.	• Detail study of Chemistry of Natural occurring organic molecules like terpenoids, steroids, hormones, vitamins, lipids, alkaloids.
	Paper XVI: Applied Organic Chemistry.	• Study of agrochemicals, synthetic flavors, dyes & polymers with unit processes involved in their synthesis.
	Practical Course OCHP- VII	• Understand the basics of two or three step organic preparations.
	Practical Course	• Literature survey. Study of reactions,

	OCHP- VIII (Project)	synthesis, mechanism, isolation of natural products. • standardization of reaction conditions, use of new methods etc. • Identification of organic compounds by spectroscopic methods.

Department of Computer Science (Entire)

Program Name	**Course Name/ paper**	**Course Outcome** **By the end of each of the following course, the students will be able to:**
B. Sc. I	Computer Science Paper - I Fundamentals of Computer	• To understand the basic components of computer and working of computer.
	Computer Science Paper - II Programming in C Part - I	• To learn problem solving techniques and design the program for the problem.
	Electronics Paper - I Electronic Devices and Circuits Part - I	• Apply the concepts of basic electronic devices to design various circuits.
	Electronics Paper - II Digital Electronics Part –I	• Learn the basics of gates. • Acquire the basic knowledge of digital logic levels.
	Mathematics Paper – I Discrete Mathematics	• To learn basic concepts of set, relations, graphs and trees • To learn representing discrete objects and relations using abstract mathematical structures.
	Mathematics Paper – II Algebra	• TO develop and apply concepts of expressions, equations and inequalities to investigate and describe relationships and solve problem
	Statistics Paper – I Descriptive Statistics – I	• Classify the data by means of diagrams and graph
	Statistics Paper – II Probability Theory and Discrete Probability Distributions	• To analyze data using statistical tools to construct hypothesis and different test procedures
	Computer Science Paper - III Linux Operating System	• To understand the fundamental concepts of open source operating system linux.
	Computer Science Paper - IV Programming in C Part - II	• To learn file management through programming
	Electronics Paper - III Electronic Devices and Circuits Part - II	• Design and analyze of electronic circuits. • Evaluate frequency response to understand behavior of Electronic circuits.
	Electronics Paper - IV Digital Electronics Part –II	• Construct basic combinational circuits and verify their functionalities.
	Mathematics Paper – III Graph Theory	• Apply theoretical concepts to address network design problems.

	Mathematics Paper – IV Calculus	• Write detailed solutions using appropriate mathematical language. • Generate solutions to unfamiliar problems.
	Statistics Paper – III Descriptive Statistics – II	• Analyze and compare different sets of data.
	Statistics Paper – IV Continuous Probability Distributions and Testing of Hypothesis	• To analyze data using statistical tools to construct hypothesis and different test procedures
B. Sc. II	Computer Science Paper - V Relational Database Management System	• Helps to study purpose of database as well as how to create the databases.
	Computer Science Paper - VI Object Oriented Programming using C++	• It is used to develop real life applications.
	Electronics Paper - V Computer Organization	• Understand how to implement memory chips, boards, modules and caches. • Understand the basics of hardwired and micro-programmed control of the CPU.
	Electronics Paper - VI Computer Instrumentation	• Get knowledge of construction and working principal and applications of analog and digital instruments. • Enhance the ability to solve and analyze engineering problem.
	Mathematics Paper – V Linear Algebra	• Enhance the student's ability to reason mathematically.
	Mathematics Paper – VI Numerical methods	• Able to obtain approximate representative numerical results of the problems.
	Skill Enhancement Course - I Python Programming	• Able to design solutions for complex engineering problems and design system components.
	Computer Science Paper - VIII Data structure	• helps to understand memory structure. •
	Computer Science Paper - IX Cyber security essentials	• To create awareness about cyber-crimes.
	Electronics Paper - VII Microcontroller Architecture and Programming	• Become familiar with the architecture and the instruction set of an Intel microprocessor.
	Electronics Paper - VIII Communication Techniques	• Apply the knowledge of signals and system and evaluate the performance of digital communication system in the presence of noise.
	Mathematics Paper – VII Computational Geometry	• Construct algorithms for simple geometrical problems. • Implement computational geometry algorithms.
	Mathematics Paper – VIII Operation Research	• Gain techniques to make effective business decisions.
	SEC-II Skill Enhancement Course - II HTML	• Able to design web applications.

B Sc. III	IX -Operating system	• Helps to understand the basic components of computer operating systems & interactions among various components.
	X Introduction to VB.net	• Understand working of .Net Framework. • Study importance and applications of exception handling.
	XI Data Communication	• Identify key considerations in selecting various transmission media in networks. • Familiar with switching and routing techniques in networking. • Understand different data communication modes.
	XII Software Engineering	• Helps to understand different phases of software development.
	XIII Introduction to Java Programming	• Implement Object oriented concepts using java • Develop Object oriented software application
	XV Elective-II E-Commerce	• Introduction, goals, components and types of e-commerce.
	XVI Introduction to Linux Operating system	• To understand the fundamental concepts of open source operating system Linux.
	XVII Object Oriented Programming with VB.net	• Demonstrate concept of object-oriented programming using C#
	XVIII Computer Networks	• Understand with switching and routing concepts in networking technologies. • Familiar with network security concepts
	XIX Unified Modeling Language	• Able to analyze, design, verify, validate, implement, and maintain software systems.
	XX Advanced Java Programming	• Develop GUI using Java • Handle Database connectivity using java • Develop dynamic web pages using servlet and JSP • Develop client-server application
	XXII Elective-II Web Technology	• Able to design web applications.

Department of Physics

Program Name	**Course Name/ paper**	**Course Outcome** **By the end of each of the following course, the students will be able to:**
B.Sc. I	Paper I Mechanics I (DSC-1-A)	• Knowledge and applications of vector algebra in Physics. • Understanding of basic ordinary differential equations. • Concept of Newton's laws of motion and their applications. • Basic concept of rotational motion.

	Paper II Mechanics II (DSC-2-A)	• Understand law of Gravitation. • Use of Satellite in Global Positioning System (GPS). • Concept of elasticity and its use in day to day life. • Differentiation of hydrophilic and hydrophobic surfaces.
	Paper III Electricity Magnetism I (DSC-1-B)	• Knowledge and applications of vector calculus in Physics. • Understanding of vector integrals. • Conceptual clarity of electrostatics. • Concept of polarization in dielectrics.
	Paper IV Electricity Magnetism II (DSC-2-B)	• Qualitative analysis of AC circuits. • Magnetism and magnetostatics. • Concept of electromagnetic induction. • Idea of Maxwell's equations of electromagnetic waves.
	Practical Paper	• To enhance the learning abilities through development of simple laboratory experiments. • To develop the practical skills and techniques to tackle the scientific problems.
B. Sc. II	Paper V- Thermal Physics and Statistical Mechanics-I	• Highlight of different velocities of gas molecules. • Knowledge of Maxwell's distribution of gas molecules. • Merits and drawbacks of thermometers. • Basic thermodynamic processes and application to heat engine.
	Paper VI Waves and Optics –I	• Knowledge of superposition of harmonic oscillators. • Theory of coupled oscillations. • Understanding the ultrasonic waves and their applications. • Basics of sound in context of acoustics of buildings.
	Paper VII Thermal Physics and Statistical Mechanics-II	• Conceptual clarity of thermodynamic functions and Clausius-Clapeyron equation. • Understanding the black body radiation spectrum. • Planck's law of radiation.

		• Preliminary knowledge of classical and quantum statistical mechanics.
	Paper VIII Waves and Optics II	• Cardinal points and their graphical representation. • Rayleigh criterion and resolving power of prism and grating. • Qualitative study of polarization of light. • Study of interference for determination of wavelength of light
	Practical Paper	• To enhance the learning abilities through development of simple laboratory experiments. • To develop the practical skills and techniques to tackle the scientific problems.
B Sc. III	Paper IX Mathematical and Statistical Physics	• Curvilinear coordinates and coordinate systems. • Understanding of basic partial differential equations. • Basic concepts in statistical mechanics • Idea of classical and quantum statistical mechanics.
	Paper X Quantum Mechanics	• Study motion of particles in one and three dimensions • Study quantum mechanical behavior of the particle • Differentiation between Classical and Quantum mechanics • Study different operators in quantum mechanics.
	Paper XI Classical Mechanics	• Understanding conservation laws of mechanics of system of particles. • Lagrange's equations and their applications. • Hamilton's principle and techniques of calculus of variation • Understanding the rigid body dynamics.
	Paper XII Atomic & Molecular Spectra	• Optical spectral lines: selection and intensity rules. • Understanding doublet fine structure. • Concept of Raman Effect. • Milky Way Galaxy and Solar system.
	Paper XIII Nuclear and Particle Physics	• Construction and working of different types of nuclear accelerators.

		• Construction and working of different types of nuclear detectors. • Understanding basic nuclear reactions and models. • Introductory elementary particles.
	Paper XIV Energy Studies and Material science	• Knowledge on different types of renewable energy resources. • Study of wind energy and its generation by wind turbine. • Study of solar energy and its generation by solar panel. • Synthesis of nanoparticles.
	Paper XV Electrodynamics and Electromagnetic Waves	• Motion of charged particles in fields. • Understanding the basic laws in electrostatics and magnetostatics. • Deriving the Maxwell's equations of electromagnetic waves. • Propagation of electromagnetic waves in free space.
	Paper XVI Solid State Physics	• Models of different crystal structures • Analysis of X-ray diffraction patterns • Applications of IC-555 as different multi vibrators • Difference between metals, semiconductors and insulators.
	Practical Paper	• To enhance the learning abilities through development of simple laboratory experiments. • To develop the practical skills and techniques to tackle the scientific problems. • Understand the concepts of General Physics and Computer, Optics, Electricity

Department of Statistics

Program Name	**Course Name/ paper**	**Course Outcome** **By the end of each of the following course, the students will be able to:**
	Paper I: DESCRIPTIVE STATISTICS - I	• To compute various measures of central tendencies, dispersion, moments, skewness, kurtosis and to interpret them. • To analyze data pertaining to attributes and to interpret the results.
	Paper II: ELEMENTARY PROBABILITY THEORY	• To distinguish between random and non-random experiments.

B. Sc. I		• To find the probabilities of various events. • To understand concept of conditional probability and independence of events.
	Paper III DESCRIPTIVE STATISTICS –II	• To compute correlation coefficient, interpret its value. • To compute regression coefficient, interpret its value and use in regression analysis. • To compute various index numbers.
	Paper IV: DISCRETE PROBABILITY DISTRIBUTIONS	• To apply discrete probability distributions studied in this course in different situations. • Distinguish between discrete variables and study of their distributions. • Know some standard discrete probability distributions with real life situations. • Understand concept of bivariate distributions and computation of related probabilities.
	Practical Paper I	• Represent statistical data diagrammatically and graphically. • compute various measures of central tendency, dispersion, moments, skewness and kurtosis. • compute correlation coefficient, regression coefficients. • understand Consistency, Association and Independence of Attributes. • Interpret summary Statistics of computer output. • know applications of some standard discrete probability distributions. • compute the index numbers.
B. Sc. II	Paper V: PROBABITITY DISTRIBUTION - I	• To understand concept of discrete and continuous distributions with real life situations. • To distinguish between discrete and continuous distributions. • To find various measures of r.v and probabilities using it's probability distribution. • To know the relations among the different distributions. • To understand the concept of transformation of univariate and bivariate continuous random variable.
	Paper VI: STATISTICAL METHOD –I	• understand the concept of Multiple Linear Regression. • understand the concept of Multiple Correlations and Partial Correlation. • know the concept of sampling theory. • understand the need of vital statistics and concept of mortality and fertility.
	Paper VII: PROBABITITY	• understand the concept of Multiple Linear

	DISTRIBUTION – II	Regression. • understand the concept of Multiple Correlations and Partial Correlation. • know the concept of sampling theory. • understand the need of vital statistics and concept of mortality and fertility. • understand the relations among the different distributions. • understand the Chi-Square, t and F distributions with their applications and inter-relations.
	Paper VIII STATISTICAL METHOD –II	• know the concept and use of time series. • understand the meaning, purpose and use of Statistical Quality Control, construction and working of control charts for variables and attributes • apply the small sample tests and large sample tests in various situations.
	Practical Paper – II	• To compute probabilities of standard probability distributions. • To compute the expected frequency and test the goodness of fit. • To understand how to obtain random sample from standard probability distribution • To sketch of the p. m. f. / p. d. f. for given parameters
	Practical Paper -III	• To fit plane of Multiple regression and compute Multiple and Partial correlation coefficients. • To draw random samples by various sampling methods • To construct various control charts. • To understand the applications of Poisson, Geometric and Negative Binomial distributions.
B Sc. III	Paper IX Probability Distribution I	• Gain the knowledge of important univariate distributions such as Laplace, Cauchy, Lognormal, Weibull, Logistic, Pareto, Power Series Distribution. • Gain the knowledge of Multinomial and Bivariate Normal Distribution. • Get the knowledge of Truncated Distributions. • Information of various measures of these probability distributions. • Acumen to apply standard continuous probability distributions to different situations. • Get the knowledge of probability.
	Paper X Statistical Inference - I	• gain knowledge about important inferential aspect of point estimation. • understand the concept of random sample from

		a distribution, sampling distribution of a statistic standard error of important estimates such as mean and proportions. • get knowledge of various important properties of estimator, • get knowledge about inference of parameters of standard discrete and continuous distributions, concept of Fisher information and CR inequality, knowledge of different methods of estimation.
	Paper XI Design of experiments	• get knowledge of basic terms used in design of experiments. • understand the concept of one-way and two-way analysis of variance, knowledge of various designs of experiments such as CRD, RBD, LSD and factorial experiments. • Get knowledge about use of using an appropriate experimental design to analyze the experimental data.
	Paper XII Operations Research	• Appreciate Concept of Linear programming problem. • get knowledge of solving LPP by graphical and Simplex method, knowledge of Transportation, Assignment and Sequencing problems. • understand the concept of queuing theory. • get knowledge of simulation technique and Monte Carlo technique of simulation.
	Paper XIII Probability Theory. II	• get knowledge about order statistics and associated distributions • Understand the concept of convergence and Chebyshev 'sine quality and its uses • understand the concept of law large numbers and central limit theorem and its uses. • get knowledge of Stochastic processes, Markov chain, Queing theory, Calculation of transition probabilities and their interpretation.
	Paper XIV: Statistical Inference II	• understand the concept of interval estimation. • Get knowledge of interval estimation of mean, variance and population proportion, population median. • understand important aspect of test of hypothesis and associated concept. • understand concept about parametric and non-parametric methods and knowledge of some important parametric as well as non–parametric tests.
	Paper XV Sampling Theory	• get basic knowledge of complete enumeration and sample, sampling frame sampling distribution, sampling and non-sampling errors,

		principal steps in sample surveys, sample size determination, limitations of sampling etc. • understand the concept of various sampling methods such as simple random sampling, stratified random sampling, systematic sampling and cluster sampling. • Get an idea of conducting sample surveys and selecting appropriate sampling techniques. • know comparison of various sampling techniques. • get knowledge of ratio and regression estimators.
	Paper XVI Quality Management and Data Mining.	• get knowledge of quality tools used in Quality management, Data preparation for knowledge discovery: Data understanding and data cleaning tools, Data transformation, Data Discretization, Data Visualization. • understand Data Mining Process: CRISP and SEEMA; • Supervised and unsupervised learning techniques:
	Practical Paper IV	• compute the expected frequency and test the goodness of fit for truncated Binomial, Poisson distribution • understand how to obtain random sample from Laplace, Log Normal, Cauchy, Weibull, Exponential and Normal distribution by inverse C.D.F Method. • carry out ANOVA for CRD and LSD using R-software. • draw random samples and fitting of standard distributions using R-software. • compute probabilities of Type I and Type II error, MP and UMP test using R-software. • understand the applications of Multinomial and Bivariate Normal distributions.
	Paper V	• estimate parameters of standard distributions by using different methods of estimation. • carry out nonparametric tests for testing hypotheses • carry out SPRT for discrete and continuous standard distributions.
	Paper VI	• Upon completion of this course the students will be able to • analyze CRD, RBD, LSD and factorial experiments. • apply missing plot technique for RBD and LSD. • carry out ANOCOVA in CRD and RBD. • draw random sample by using different methods

		Simple random sampling, Stratified sampling, Systematic sampling and Cluster sampling. • determine sample size to be drawn.
	Paper VII	• solve LPP by Simplex method. • solve assignment and transformation problem. • simulate from different distributions. • To draw EWMA chart CUSUM charts. • To determine six sigma limits. • apply acceptance sampling techniques. • apply data mining techniques for classification and clustering.

Department of Microbiology

Program Name	**Course Name/ paper**	**Course Outcome** **By the end of each of the following course, the students will be able to:**
B. Sc.- I	Paper I - Introduction to Microbiology	• Understanding of the subject & techniques – History and scope of Microbiology, Bacterial nomenclature, Different staining procedures and Microscopy.
	Paper II - Microbial Diversity	• Microbial types & Control of microorganism, nutrition and Nutritional Classification of microorganisms, Types of culture media and cultivation of microorganism.
	Paper III - Bacteriology	• Cell structure & organization, Isolation, cultivation, concept of pure culture and preservation of microorganisms.
	Paper IV - Microbial Biochemistry	• Understanding of different biomolecules & concept of metabolism and energetic.
	Practical Course I- Introduction to Microbiology & Microbial diversity	• Students understood good laboratory practices, Biosafety in laboratory and acquired laboratory skills. • Students observed bacteria and their parts /components by different staining techniques. • Students prepared and sterilized various culture media.
	Practical Course II – Bacteriology & Microbial Biochemistry	• Students acquired laboratory skills and techniques for isolation, enumeration and cultivation of bacteria from different environments. • Students performed various biochemical tests for identification of bacteria. • Students got knowledge of test to determine bacteriological quality of milk.
B. Sc.- II	Paper V- Microbial Physiology & Metabolism	• Study of cell structure growth types, phases & metabolism. Transport across membrane &

		electron transport chain.
	Paper VI – Applied Microbiology	• Students studied Microbiology of Air, Water & Milk, municipal water purification, Fermenter & Types of Fermentations, Screening Techniques.
	Paper VII – Microbial Genetics and Molecular Biology	• Students learnt concepts of Genetic Code, Mutation, Gene transfer, DNA repair, Lac operon.
	Paper VIII – Basics in Medical Microbiology and Immunology	• Understanding of Types of Diseases and Immunity, Immune response, antigen-antibody reaction.
	Practical Course III –	• Students demonstrated spore, flagella and nucleus of microorganisms. • Students prepared different biochemical test media and used them to perform various biochemical tests. • Students demonstrated effect of different environmental factors on growth of bacteria.
	Practical Course IV –	• Students learnt the techniques for bacteriological analysis of water. • Students used techniques for primary screening of antibiotic and amylase producers. • Students studied bacterial growth phases. • Students learnt the techniques for isolation of lac negative mutants and identification of pathogens. • Students studied serological techniques and blood group determination.
B. Sc.- III	Paper IX – Virology	• Students got knowledge of General types and properties of viruses, isolation, cultivation, purification and enumeration of viruses. Role of viruses in oncogenesis.
	Paper X – Immunology & Serology	• Learning of cell of immune system & their functioning, types of immune responses, new diagnostic techniques & allergic reactions.
	Paper XI – Food & Industrial Microbiology	• Concept of food poisoning and infections, probiotics, preservation of industrial microbes, industrial productions of products, strain improvements, Microbiological assays, Bio methanation, recovery of industrial products
	Paper XII – Agricultural Microbiology	• Study of elemental cycles, Biopesticides • Biofertilizer, compost & manure, Plant pathology, Biodegradations.
	Paper XIII – Microbiology Genetics	• Understanding of relation of gene and life, gene organization, function, regulation and expression, Techniques in Molecular Biology and their applications, Transposones, r – DNA technology

	Paper XIV – Microbial Biochemistry	• Students learnt enzymes allosteric enzymes, ribozymes, isozymes, enzymes kinetics, enzyme regulation and immobilization, extraction & purification of enzymes, synthesis of macromolecules, bioluminescence, metabolic pathways, assimilation of elements,
	Paper XV – Environmental Microbiology	• General characters of industrial wastes, Biosafety, Eutrophication, EIA, Treatment and disposal of waste, Environmental monitoring, bioremediation, bioleaching,
	Paper XVI – Clinical Microbiology	• Study of various bacterial, protozoal, viral and fungal human diseases, Chemotherapy, gene therapy, Immuno prophylaxis.
	Practical Course I – Virology & Microbial Genetics	• Students acquired techniques for isolation of coliphages, mutants and chromosomal DNA. • Students demonstrated effect of UV light on bacteria. • Students got knowledge of carcinogenicity testing and bacterial gene transfer. • Students carried out electrophoretic separation of DNA.
	Practical Course II – Food & Industrial Microbiology	• Students learnt techniques of assay of amylase, vitamin – B12 and penicillin. • Students performs microbial testing of water and tomato sauce. • Students produced wine, citric acid and amylase. • Students isolated lactics and examined milk by DMC.
	Practical Course III – Agricultural & Environmental Microbiology	• Students developed skills and techniques for isolation of Azotobacter, Rhizobium, Xanthomonas, PSB. • Students got knowledge of practical methods and skills for determination of BOD and COD of wastes., estimation of organic carbon, calcium and magnesium content of soil.
	Practical Course IV – Immunology & Clinical Microbiology	• Students developed skill and techniques for isolation of different pathogens. • Students acquired practical skill for determination of MIC of streptomycin, sensitivity of pathogens to antibiotics. • Students acquired practical skills and techniques • for blood cell count, Widal test, ELISA, Hb. determination and urine analysis.

Department of Biotechnology

Program Name	Course Name/ paper	Course Outcome By the end of each of the following course, the students will be able to:
B. Sc.- I	Paper I - Basics of biotechnology I	• Basic understanding of the subject and techniques
	Paper II - Basics of biotechnology II	• Basic understanding of the subject and instruments
	Paper III - Basics of Cell biology and Microbiology	• Study of cell structure and microbial morphology and types
	Paper IV - Basics of Microbiology	• Study of nutrition, control and identification of microorganisms
	Practical Course I - Laboratory exercises in Cell Biology & Microbiology	• Students understood good laboratory practices, Biosafety in laboratory and acquired laboratory skills. • Students observed bacteria and their parts /components by different staining techniques. • Students prepared and sterilized various culture media. • Students acquired laboratory skills and techniques for isolation, enumeration and cultivation of bacteria from different environments.
	Practical Course II – Laboratory exercises in Biochemistry	• Students prepared buffers, molar and normal solutions • Students estimated glucose, DNA, RNA & Reducing sugar by various methods. • Students isolated starch and casein from potato and milk. • Students studied Lambert – Beer's law.
B. Sc.- II	Paper V- Biophysics and Enzyme technology	• Basic understanding of enzyme, enzyme kinetics, immobilization and instrumentation
	Paper VI – Molecular biology	• Understanding of central dogma of life, modes of gene transfer and DNA repair mechanisms
	Paper VII – Immunology	• Learning of cells of immune system and functioning and hypersensitivity
	Paper VIII – r-DNA technology	• Basics understanding of r-DNA technology and techniques. (PCR, blotting, DNA sequencing, gene silencing)
	Practical Course I – Laboratory exercises in Enzymology and Molecular Biology	• Students demonstrated effect of temp., pH, inhibiter and activator on amylase. • Students Isolated Lac negative mutants. • Students estimated amylase and studied UV survival curve. • Students fractionated mitochondria and nucleus.
	Practical Course II- Laboratory exercises in Immunology and r-DNA	• Students performed Dot ELISA, radial immune diffusion, Ligation, Restriction Digestion, Widal Test and RPR Test.

	technology	• Students isolated plasmid and chromosomal DNA. • Students performed agarose gel electrophoresis and DNA sequencing from autoradiogram.
B. Sc.- III	Paper IX – Biochemical techniques	• Study of advanced techniques. (chromatography, electrophoresis, tracer techniques, centrifugation, cell disruption, precipitation, dialysis)
	Paper X – Animal cell culture	• Basic understanding of animal cell, techniques and applications
	Paper XI – Bioprocess engineering	• Basic understanding of concept of fermentation, requirements and downstream processing
	Paper XII – Fermentation technology	• Study of production, recovery and fermentation economics of industrial products
	Paper XIII – Plant biotechnology	• Basic understanding of plant cell culture, techniques and applications
	Paper XIV – Environmental biotechnology	• Learning of environmental pollution, waste management and biofertilizers
	Paper XV – Cell metabolism and Virology	• Study of metabolic pathways and virology
	Paper XVI – Gene biotechnology and Bioinformatics	• Understanding of techniques in gene biotechnology and bioinformatics
	Practical Course I – Techniques in Plant and Environmental Biotechnology	• Students prepared stock solutions and media for plant tissue culture. • Students performed various techniques like callus culture, suspension culture, anther culture, initiation of micropropagation and rute differentiation. • Students determined BOD & COD of sewage. • Students isolated Azotobacter Rhizobium, PSB & Xanthomonas.
	Practical Course II – Techniques in Microbial, Biochemical technology and Bioinformatics	• Students performed bioassay of penicillin, Vitamin B12 and xanthan gum. • Students produced and estimated ethanol content. • Students produced and estimated amylase content. • Students isolated vitamin B12 requiring mutants and E. coli phages. • Students determine molecular weight of DNA. • Students purified proteins by various methods.

		• Students performed bioinformatics experiments.
	Practical Course III – Project report	• Students completed research project on selected topics, prepared a report and submitted at the time of examination.
	Practical Course IV – Entrepreneurship	• Students completed Entrepreneurship on selected • Industry prepared a report and submitted at the time of examination.

Department of Zoology

Program Name	**Course Name/ paper**	**Course Outcome** **By the end of each of the following course, the students will be able to:**
B. Sc. I	Paper I Animal Diversity-I	• Study distinguishing identification characters of non –chordate animals.
	Paper II Physiology	• Understanding structure, physiology and biochemistry of tissues and organs.
	Paper III Cell biology and Evolutionary biology	• Study Cell organelles with their structure and function, difference between plant and animal cells. • Understanding origin, evolutionary theories and evolutionary evidence.
	Paper IV Genetics	• Study Mendelian principles, linkage, crossing over and mutations.
	Practical I and II	• Identify Non-Chordate Animals and classify them up to Order level with basis of systematics. • To study the physiological experiments like ABO blood group and Haemin crystals.
B. Sc. II	Paper V Animal diversity-II	• Understanding of distinguishing identification characters of chordates. • Identification of venomous and non-venomous snakes and origin of mammals.
	Paper VI Biochemistry	• Study of nucleic acid, metabolism of macromolecules. • Classification and kinetics of enzymes.
	Paper VII Reproductive biology	• Understanding male and female reproductive organs, hormonal regulation. • Reproductive and modern contraceptive technologies.
	Paper VIII Applied Zoology	• Acquiring knowledge of different types of associations in animals • Awareness about epidemiology of diseases, disease causing agents and their control measures

B. Sc. III		• Importance of insects, poultry farming.
	Practical I and II	• Identify Non-Chordate Animals and classify them upto Order level with basis of systematic. • Get familiar with qualitative and quantitative biochemical tests. • Knowledge of Reproductive Surgical Techniques. • Apply control measures to reduce the impact of insect pests on human and plants. • To develop skill of animal handling.
	Paper IX Comparative anatomy of vertebrates	• Comparative study of systems in vertebrates. • Integuments and its derivatives.
	Paper X Molecular Cell Biology and Animal Biotechnology	• Study DNA replication, damage and repair. • Tools and techniques in biology
	Paper XI Biotechniques and Biostatistics	• To study stem cell culture and various culture techniques. • Able to apply statistics and calculus for biological data.
	Paper XII Aquatic Biology	• To study various aquatic biomes • Understand nutrient cycles. • Knowledge of endocrine glands, hormonal receptors and mechanism.
	Paper XIII Developmental Biology of Vertebrates	• Understand gametogenesis and development process of chick, Amphioxus and insects. • Types of placenta and fetal membranes.
	Paper XIV Immunology	• Able to understand basic properties of antigens and antibodies. • To study Hybridoma technology.
	Paper XV Applied Zoology	• To study techniques of Aquaculture. • To get knowledge of Animal Husbandry.
	Paper- XVI Insect Vectors and Histology	• Able to apply knowledge of various disease-causing agents and their control measures. • To study histology of mammalian organs.
	Practical I, II, III and IV	• Understand developmental stages in developing embryo. • Comparative study of various systems in different classes of Vertebrate Animals. • Ability to perform routine blood analysis. • Apply knowledge in various fields like apiculture, prawn culture, goat farming, etc. • To develop skill of micro technique.

		• To study various histochemical techniques. • Carry out various biotechniques. • To study various instruments used in limnology and their significance. • To perform ecological experiments.

Department of Mathematics

Program Name	Course Name/ paper	Course Outcome Upon successful completion of this course, the student will be able to:
B.Sc. I	Paper I	• Understand De Moivre's Theorem and its applications • define hyperbolic functions and its properties • carry out successive differentiation and its applications. • understand concept of partial differentiation with some properties and applications to maxima and minima.
	Paper II	• Understand MVT and its applications to Taylor series. • workout Examples on in determinant form. • understand the epsilon - delta definition of limit. • appreciate properties of continuous function.
	Paper III	• Solve examples on exact and those reducible to exact. • solve first order higher degree equations • solve linear differential equation with constant coefficients.
	Paper IV	• Understand the concept of second order differential equations and methods of solving them. • solve total differential equation and ordinary differential equations. • formulate partial differential equations and some simple methods of solving them.
	Core Course Practical in Mathematics I (CCPM - I)	• on Leibnitz's theorem, Euler's theorem and De Moivre's Theorem • on Maxima and Minima of functions of two variables, tracing of curves in polar form. • On Radius of curvature for Cartesian curve, parametric and polar curve. • On Lagrange's Mean Value theorem, Cauchy's Mean Value theorem, Hospital Rule: • On Differential equations.

B.Sc. II	Paper V	• understand types of functions and how to identify them. • use mathematical induction to prove various properties. • understand the basic ideas of Real Analysis. prove order properties of real numbers, completeness property and the Archimedean property.
	Paper VI	• understand properties of matrices • solve System of linear homogeneous equations and linear non-homogeneous • equations. • find Eigen values and Eigen vectors. • construct permutation group and relate it to other groups. • classify the various types of groups and subgroups.
	Paper VII	• understand sequence and subsequence. • prove The Bolzano-Weierstrass Theorem. • derive Cauchy Convergence Criterion. • find convergence of series. apply Leibnitz Test.
	Paper VIII	• prove Lagrange's theorem. • derive Fermat's theorem. • understand properties of normal subgroups, factor group. • define homomorphism and isomorphism's in group and rings. • derive basic properties of rings and subrings.
	Core Course Practical in Mathematics (CCPM – II)	• Eigen values, Eigen vectors and Cayley Hamilton theorem • Types of functions and Mathematical induction • Limit of a sequence, Comparison test, Cauchy's root test, D' Alembert's ratio test and Rabbi's test. • Group, Cyclic subgroup, Permutation group and Homomorphism and Kernel.

B.Sc. III	Paper IX Real Analysis	• Basic concepts of sets and functions and its properties. • Sequences and Series of real numbers and its properties. • The integration of bounded function on a closed and bounded interval • Some of the families and properties of Riemann integrable functions • The applications of the fundamental theorems of integration • Extension of Riemann integral to the improper integrals when either the interval of integration is infinite or the integrand has infinite limits at a finite number of points on the interval of integration
	Paper X Modern Algebra	• Define group subgroup and relevant theorems • Basic concepts of group and rings with examples • Identify whether the given set with the compositions form Ring, Integral domain or field. • Understand the difference between the concepts Group and Ring. • Apply fundamental theorem, Isomorphism theorems of groups to prove these theorems for Ring.
	Paper XI Partial Differential Equations	• Introduce linear partial differential equations of order one and method of solving them. • introduce non-linear partial differential equations of order one and method of solving them. • introduce linear homogeneous partial differential equations with constant coefficients and method of solving them. • introduce linear homogeneous partial differential equations with constant coefficients and method of solving them.
	Paper XII Numerical Methods-I	• solve non-linear equations • System of linear equations exact method. • System of linear equations iterative method. • Compute eigen values and eigen vectors of matrices
	Paper XIII Metric Spaces	• acquire the knowledge of notion of metric space, open sets and closed sets. • demonstrate the properties of continuous functions on metric spaces, • apply the notion of metric space to continuous functions on metric spaces. • understand the basic concepts of connectedness, completeness and compactness of metric spaces

		• appreciate a process of abstraction of limits and continuity to metric spaces.
	Paper XIV Linear Algebra	• understand notion of vector space, subspace, basis. • understand concept of linear transformation and its application to real life situation. • work out algebra of linear transformations. • appreciate connection between linear transformation and matrices. • work out eigen values, eigen vectors and its connection with real life situation.
	Paper XV Complex Analysis	• learn basic concepts of functions of complex variable. • be introduced to concept of analytic functions. • learn concept of complex integration and basic results thereof. • be introduced to concept of sequence and series of complex variable. • learn to apply concept of residues to evaluate certain real integrals.
	Paper XVI Numerical Methods-II	• understand and solve method of interpolation with equal intervals. • understand and solve method of interpolation with unequal intervals. • apply methods numerical differentiation and integration. • solve ordinary differential equation using numerical methods
	Core Course Practical in Mathematics (CCPM – III)	• Basic concepts in scilab programming. • Looping structures in Scilab programming. • Using Scilab as a calculator. • Using Scilab to solve linear equations by Gauss Elimination, Gauss Jordan methods. • Using Scilab to solve linear differential equations by Euler, Euler modified, Runge Kutta 2nd and 4th order methods.
Program Name	**Course Name/ paper**	**Course Outcome**
M. Sc. I	Advanced Calculus	• Analyze convergence of sequence and series of function and check differentiability of functions of several variables
	Linear Algebra	• To introduce basic notions in linear algebra and use the results in developing advanced mathematics.

	Complex Analysis	• To familiarize fundamental concepts of complex analysis such as analytic functions, conformal maps, Taylor and Laurent series, Singularity.
	Classical Mechanics	• Discuss the motion of system of particles using Lagrangian and Hamiltonian. • Solve extremization problems and discuss motion of rigid body.
	Ordinary Differential Equations	• To introduce basic notions in differential equations and use the results in developing advanced mathematics.
	Functional Analysis	• To familiarize fundamental topics, principles and methods of functional analysis.
	Algebra	• To study group theory and ring theory in some details, discuss module structure over a ring.
	General Topology	• To introduce the fundamental concepts in topological spaces • Continuous functions on topological spaces, compact and connected sets in topological spaces, separation and countability axioms and product spaces
	Numerical Analysis	• Discuss the methods to solve the linear and non-linear equations, find numerical integration and analysis error in computation. • Solve differential equation using various numerical methods.
	Partial Differential Equations	• Classify partial differential equations and transform into canonical form. Solve linear partial differential equations of both 1st and 2nd order, • solve boundary value problem for Laplace equation, Heat equation, The wave equation by separation of variables in Cartesian, polar, Spherical and cylindrical co-ordinates.
M.Sc. II	Real Analysis	• generalize the concept of length of interval. • analyze the properties of Lebesgue measurable sets. • demonstrate the measurable functions and their properties. • understand the concept of Lebesgue integration of measurable functions. • characterize Riemann and Lebesgue

		integrability. • prove completeness of *L*Spaces.
	Advanced Discrete Mathematics	• To determine the basis and degree of a field over its subfield. • construct splitting field for the given polynomial over the given field • find primitive nth roots of unity and nth cyclotomic polynomial. • make use of Fundamental Theorem of Galois Theory and Fundamental Theorem of Algebra to solve problems in Algebra. • apply Galois Theory to constructions with straight edge and compass.
	Number Theory	• To learn more advanced properties of primes and pseudo prime. • apply Mobius Inversion formula to number theoretic functions, explore basic idea of cryptography • understand concept of primitive roots and index of an integer relative to a given primitive root • derive Quadratic reciprocity law and its apply to solve quadratic congruences.
	Operation Research-I	• To identify Convex set and Convex functions. • Construct linear integer programming models and discuss the solution techniques. • Formulate the nonlinear programming models. • Propose the best strategy using decision making methods, solve multi –level decision problems using dynamic programming method.
	Fuzzy Mathematics	• To acquire the knowledge of notion of crisp sets and fuzzy sets. • understand the basic concepts of crisp set and fuzzy set. • develop the skill of operation on fuzzy sets and fuzzy arithmetic. • demonstrate the techniques of fuzzy sets and fuzzy numbers. • apply the notion of fuzzy set, fuzzy number in various problems.
	Integral Equations	• classify the linear integral equations and demonstrate the techniques of converting the initial and boundary value problem to integral equations and vice versa. • develop the technique to solve the Fredholm integral equations with separable kernel.

		• develop and demonstrate the technique of solving integral equations by successive approximations, using Laplace and Fourier transforms. • to analyse the properties of symmetric kernel. • to prove Hilbert Schmidt Theorem and solve the integral equation by applying it.
	Advanced Discrete Mathematics	• To classify the graphs and apply to real world problems, simplify the graphs using matrix, study Binomial theorem. • use to solve various combinatorial problems, simplify the Boolean identities and apply to switching circuit
	Algebraic Number Theory	• To deal with algebraic numbers, algebraic integers and its applications, concept of lattices and geometric representation of algebraic numbers. • understand the concept of fractional ideals, late Finitely generated abelian groups and modules.
	Operation Research-II	• To decide policy for replacement, calculate economic lot size, derive Poission distribution theorem and compute attributes of distribution model, construct Shannon Fano codes, identify optimal path by using CPM and PERT
	Fuzzy Mathematics-II	• To acquire the concept of fuzzy relations, understand the basic concepts of fuzzy logic and fuzzy algebra. • develop the skills of solving fuzzy relation equations and to construct approximate

Department of Marathi

Program Name	Course Name/ paper	Course Outcome By the end of each of the following course, the students will be able to:
B.A. I	Paper I Compulsory Generic elective (CGE -1) Course A	• Basic understanding of the Language and Literature • Basics knowledge of the poet, Author and culture of Marathi literature. • To make student eligible for the competitive Examination • Develop personality of the student. • To create a social, cultural and National integrated student.
	Paper I Compulsory Generic elective (CGE -2) : Course B	• Basic understanding of the Language and Literature • Basics knowledge of the Poet, Author and Culture of Marathi literature. • To make student eligible for the competitive Examination • Develop personality of the student. • To create a Social, Cultural and National integrated student.
	Paper I Discipline Specific Core (DSC-A1) : Course- I	• Basic understanding of the Marathi Movies, Social Media. • Basic understanding of the Language and Literature. • Basics knowledge of the Poet, Author and Culture of Marathi literature. • To make student eligible for the competitive Examination. • Develop personality of the student. • To create a social, cultural and National integrated student.
	Paper I Discipline Specific Core (DSC-A13) : Course- II	• Basic understanding of the Social Media and New Media. • To develop newspaper writing skills. • Basic understanding of the Language and Literature. • Basics knowledge of the Poet, Author and Culture of Marathi literature. • To make student eligible for the competitive Examination. • Develop personality of the student. • To create a social, cultural and National integrated student.

B.A. II	Paper III Discipline Specific Core (DSC-C1) : Paper No III kay denjar wara sutalay- Jayant Pawar ani Bhashik Kaushalye	• Emergence and History of the Drama. • Literary and aesthetic values of the Dram: structure, formats and type of the drama. • To learn form of Drama. • Understanding of the Dramatist with reference to modern literature. • To create a modern Dramatist and writer. • To generate value oriented, fellow feeling, Ethical balanced human being. • To develop communication skill.
	Paper IV Discipline Specific Core (DSC-C2) : Paper No IV kavya gandh ani Marathi Bhashik Kaushalye	• Imparting new trends in Modern Poetry. • Understanding of Poets with reference modern literature. • Evolution new Poets and Writers. • Create Ethical person and human being. • To develop communication skill
	Paper V Discipline Specific Core (DSC-C25) : Paper No V Autobiography: mati, pankh aani aakash Ani Marathi Bhashik Kaushlye	• Understand of literature form of Autobiography. • Understand of type of literature and difference between biography and autobiography. • Understand life style of the different states and countries. • To generate value oriented, fellow feeling Ethical balanced human being. • To develop writing skill (diary, autobiography, Migration description.)
	Paper VI Discipline Specific Core (DSC-C26) : Paper No VI Novel : Jugad –Kiran Gurav and Bhashik Kaushlye – Vuttant lekhan	• Understanding Novel. • Understanding of types of literature. • To create a social, cultural and National integrated student. • To develop writing skill. • To study features and characteristic of Novel. • To develop news writing skills.
B.A. III	Semester V Paper VII Kavyashatra	• To understand the origin and nature. • To understand figures of speech. • An introduction of an ancient poetry.
	Semester V Paper VIII Bhasha vidnyan aani Marathi bhasha	• To introduce to modern linguistics. • To understand the correlation between linguistics and Marathi language. • To teach origin, nature and function of language. • Give information of the transformation of sound. • To develop student's interest in Marathi Language.
	Semester V Paper IX	• To introduce Marathi medieval literature, its

	Marathi vangmayacha itihas	tradition and history. • To introduce various forms of medieval literature. • To introduce the source of inspiration for medieval literature. • To introduce cultural background of the medieval literature. • To elaborate the bond between sets and literary work of medieval literature.
	Semester V Paper X Marathi bhasha upayojan ani sarjan	• To explain formal and informal communication. • To develop different sector's language skills and capacity. • To develop four fundamental skills. That is i.e. Listening, Reading, Writing, Speaking. • To develop sound vocabulary. • With respect of the implementation of language.
	Semester V Paper XI Vangmay pravahanche Adhyayan	• To introduced different tends in Marathi literature. • To explain the inspiration, nature, characteristic development of rural literary trends. • To make them understand the different trends with reference to the prescribed literary works.
	Semester VI Paper XII Kavyashatra	• To explain the nature and types of sound vocabulary. • To explain the rasa therapy.
	Semester VI Paper XIII Bhasha vidyan ani Marathi bhasha	• To inform the reason and the types of transformation of meaning. • To develop student's interest regarding Marathi language.
	Semester VI Paper XIV Marathi vangmayacha itihas	• To introduce the tradition and history of medieval Marathi literature. • To introduce types of medieval Marathi literature.
	Semester VI Paper XV Marathi bhasha upayojan ani sarjan	• To explain formal and informal communication. • To develop different sector's language skills and capacity. • To develop four fundamental skills. That is i.e. Listening, Reading, Writing, Speaking. • To develop sound vocabulary. • With respect of the implementation of language.
	Semester VI Paper XVI Vangmay pravahanche	• To introduced different tends in Marathi literature.

	Adhyayan	• To explain the inspiration, nature, characteristic development of rural literary trends. • To make them understand the different trends with reference to the prescribed literary works.
Program Name	**Course Name/ paper**	**Course Outcome**
M.A. I	SEM I Paper 1 Bhashik awishkarachi rupe	• To understand the nature of language invention. • To understand the creative nature of Language. • To understand the relation between language and literature. • To understand the bond between language and types of literature.
	SEM I Paper 2.1 Vishesh sahityakrutincha abhyas	• How to make use of writer's study strategy. • To understand writer's literary personality and writer and his/her contemporary.
	SEM I Paper 3 Aadhunik Marathi vangmayacha itihas	• To understand the background of Maharashtrian social, political, cultural life before independence and its correlation with the literature.
	SEM I Paper 4.3 Aadhunik bhashavidhnyan	• To study the nature of language communication and to study linguist concepts of language. • To introduce modern linguistics with reference to Marathi language • To examine transformation of language. .
	SEM II Paper 5 Sahity prakarancha sukshm vichar	• To understand the concepts of literary works. • To study the nature of narration with respect of deferent literary work.
	SEM II Paper 6.1 Vishesh sahitykruticha abhyas	• How to make use of writer's study strategy. • To understand writer's literary personality and writer and his/her contemporary.
	SEM II Paper 7 Aadhunik Marathi vangmayacha itihas	• To understand the background of Maharashtrian social, political, cultural life before independence and its correlation with the literature: 1950 to 2000
	SEM II Paper 8.3 Aadhunik Bhasha vidhnyan	• To examine the influence of other language on Marathi. • To exercise grammatical practices with respect of Marathi language.
M.A. II	SEM III Paper 9 Samaj Bhasha Vidhnyan	• To understand the nature of dialect. • To understand the correlation between

		Society, Culture and Language. • To understand the scope of dialect.
	SEM III Paper 10.1 Vangmayin Sanskruti	• To understand the literary cuture. • To understand the correlation between Society and Culture.
	SEM III Paper 11 Samiksha siddhant aani upyojan	• To understand the nature of criticism and implementation of criticism. • To study selective literary work of art with respect of practical implementation of criticism.
	SEM III Paper 12.3 Boli Abhyas	• To understand the correlation between Language, Dialect and Society. • To understand the importance of the study of Dialect.
	SEM IV Paper 13 Samaj Bhashavidhnyan	• To understand the nature of dialect. • To understand the correlation between Society, Culture and Language. • To understand the scope of dialect.
	SEM IV Paper 14.1 Vangmayin Sankruti	• To understand the literary cuture. • To understand the correlation between Society and Culture. • To study the nature of literary culture. • To think on how literary culture is responsible for awakening of the Society.
	SEM IV Paper 15 Marathi Samikshechi Vatachal	• To understand the nature and traditions of Marathi criticism. • To introduce prominent critical thinking in the development of Marathi criticism.
	SEM IV Paper 16.3 Boli Abhyas	• To understand the correlation between Language, Dialect and Society. • To understand the importance of the study of Dialect. • To understand geographical impact on dialect. • To do the research on Kolhapuri Dialect.

Department of Economics

Course	Sem	Paper and number	Outcomes By the end of each of the following course, the students will be able to:
B.A. I	I	Paper I Indian Economy – I	• Know the basic problems of Indian Economy
	II	Paper II Indian Economy – II	• Know sector wise development of Indian economy
	III	Paper III Macro Economics – I	• Understand complex economic problems
		Paper IV Banks and Financial -I	• To sustain Economic development with the help of banks. • To help the citizens of India to overcome from economic crises. • To help to maintain foreign currency reserve for foreign trade • Understand Indian financial system
	IV	Paper V Macro Economics – II	• Students can understand the various ways for increasing national income • Variables and fluctuations in economy
		Paper VI Banks and Financial Institutions -II	• Understand Indian financial system
	V	Paper VII Micro Economics	• Understand basic economic problems
		Paper VIII Research Methodology in Economics (Part-I)	• Understand the basic concepts and methodology of research in economics • Importance of research in the development
		Paper IX History of Economic Thoughts (Part-I)	• Know the economic thought of International as well as Indian economists
		Paper X Economics of Development and Planning	• To help to formulate economic policies. • To regulate Indian economic development through laws & models.
		Paper XI International Economics (Part-I)	• Understand various concepts of international trade
	VI	Paper XII Market and Pricing	• Understand the factor pricing
		Paper XIII Research Methodology in Economics (Part -II)	• To develop research interest among the students in economics.
		Paper XIV History of Economic Thoughts (Part-II)	• Know the economic thought of International as well as Indian economists
		Paper XV Economics of Development	• To help to formulate economic policies. • To regulate Indian economic development

			through laws & models.
		Paper XVI International Economics (Part-II)	• Understand international trade and trade policies.
M. A.	Sem I	Paper I Micro Economic Analysis	• Analysis micro economic policy and its theories.
		Paper II Monetary Economics	• To adjust the money supply in the country as per requirement. • To suggest the monetary policy suitable to India & formulate the economic policy as per monetary situation in the country.
		Paper III Agricultural economics	• Understand agricultural problems.
		Paper IV Principles and Practice of co-operation	• To understand co-operative movement and development in India.
	Sem II	Paper V Public Economics	• Understand Indian public finance.
		Paper VI Economics of Resource and Ecology	• To aware students regarding the resources that required for the economical increase • To understand the ecology of economics.
		Paper VII Financial Institutions and Markets	• Understand Indian financial system and markets.
		Paper VIII Agriculture Development in India	• Understand agricultural development in India in five-year plan.
	Sem III	Paper IX Statistics in Economic Analysis	• Knowledge of statistics in economic analysis.
		Paper X Macro-Economic Analysis	• Developments in empirical analysis • Analysis of macro-economic variables
		Paper XI Demography	• To know World and Indian demographic profile and related issues
		Paper XII Labor Economics	• To formulate labor policies for labor development. • To provide social security & welfare services to labor.
	Sem IV	Paper XIII International Economics	• Understand trade related theories and policies.
		Paper XIV Economics of Growth and Development	• Understanding of social and sectorial aspects of developments. • Inclusive growth in the process of developments.
		Paper XV Advanced Banking	• To sustain Economic development with the help of banks. • To adjust the money supply in the country as per requirement. • To suggest the monetary policy suitable to India & formulate the economic policy.
		Paper XVI Co-operative Thoughts and Administration	• Knowledge of co-operative thoughts of various thinkers and co-operative administration.

Department of Geography

Class	Semester	Paper Name & Number	Outcomes By the end of each of the following course, the students will be able to:
B. A.	I	Paper I Physical Geography	• To inculcate branches of physical geography, importance. • Students understand composition and structure of atmosphere, insolation, pressure belts and distribution of temperature. • Students learn interior structure of earth, causes and effects of volcanos and earthquakes, continental drift theory. • Students to understand concept of weathering and denudation agents, erosional and depositional landforms.
	II	Paper II Human Geography	• To inculcate the concepts of human geography, branches of human geography and its importance. • Students understand causes and effects of population growth theory, distribution and problems of migrants. • Students recognize types and patterns of rural settlements, functions of settlements and urbanization. • Students learn about agriculture and its problem.
B.A.-II	III	Paper III Soil Geography	• Students should know soil geography which is the fundamental branch of Physical Geography. • To familiarize the students with the basics and fundamental concepts of soil geography. • With this study, students understand soil is key resource for the development of any country. • Students are aware about process of soil formation and development as well as soil properties. • Students should know classification, characteristics and distribution of soils. • Students should know the concepts related to soil degradation and erosion, causes and controlling factors of soil erosion, conservation of soils. • Students should know the concept, need and methods soil of management.
		Paper IV Resource Geography	• Students should know the concept and classification of Resources. • Students understand major resources (water, forest, energy and human) with their distribution, utilization and problems. • Students aware the sustainable resource development.

			• Students should know cartographic techniques.
	IV	Paper V Oceanography	• Students should know oceanography is the fundamental branch of Physical Geography. • To familiarize the students with the basic and fundamental concepts of oceanography. • With this study, students understand marine is key resource for the development of any country. • Students should know physical and chemical properties of oceans. • Students should know types of oceanic currents and currents of Atlantic, Pacific and Indian oceans. • Students should know hypsographic curve, wind rose, iso-salinity lines and isotherms.
		Paper VI Agriculture Geography	• Students should know Agriculture Geography is the fundamental branch of Human Geography. • To familiarize the students with the basic and fundamental concepts of Agriculture Geography. • With this study, students understand Major Agricultural Systems. • Students should know Methods of Agricultural Regionalization. • Students should know line and bar graph, pie charts.
B.A.-III	V	Paper VII Physical Geography of India	• Students learn about location of India, • Physiographic divisions of India. • Students learn climate and rivers system. • Students studed distribution of Soil, Vegetation with map.
		Paper VIII Economic Geography	• Students get knowledge about resources and economic activities. • Students learn manufacturing industries and World organization of trades. • Students study industrial location theory of Weber and Losh
		Paper IX Research Methodology	• Students learn the concept of research, approaches and types of research. • Students inculcate steps in research design and importance of research design. • Students study types of data, types of data collection, research techniques, and processing. • Students learn research writing style and, citation.
B.A.-III	VI	Paper X Economic Geography of India	• Students get knowledge of Indian resources, 2 Students studied agriculture major crop green revolution and agricultural problem • Students studied agro based and mineral based Industries.

		Paper XI Urban Geography	• Students understand the urbanization process, world urbanization, problems of urbanization. • Students studied structure and morphology of urban center. • Students go through urban problem and urban planning.
		Paper XII Political Geography	• Students learn the major concepts of political geography. • Students inculcate element of political geography. • Students learn geostrategic views of Makinder and Spykman and geopolitical issues.
	Annual Pattern	Paper XIII Map work and map interpretation	• Students get knowledge of skill types of maps. • Students learn scale, map reading of toposheet, whether maps. • Students acquire skills of calculation slopes and gradient. • students learn presentation of statistical data, projection, cartographic techniques.
		Paper XIV Advanced tools, techniques and fieldworks	• Students opportunity to get knowledge use of computer for geography. • Students acquire knowledge of Remote sensing and GIS, GPS statistical techniques, surveying and project.

Department of History

Program Name	**Course Name/ paper**	**Course Outcome** **By the end of each of the following course, the students will be able to:**
B.A.-I	Paper I –Rise of Maratha Power (1600 -1707)	• Understand the background and foundation of Maratha swarajya. • Aware about visit to Agra of Shivaji Maharaj and escape from Agra. • Feel proud of Shivaji Maharaj Coronation. • Know importance of Maratha war of independence.
	Paper – II Polity, Society and Economy under the Marathas (1600 - 1707)	• To give information about the history of modern Maharashtra. • aware about sources of Maratha swarajya. • Understand the administration in Shivaji Maharaj times. • Know the structure of society and status of religion.
B.A.- II	Paper- III History of Modern Maharashtra (1900-1960)	• Understand the beginnings and growth of nationalist consciousness in Maharashtra. • Explain the contribution of Maharashtra to the national movement. • Give an account of various movements of the peasants, workers, women and backward classes.

		• Know the background and events which led to the formation of separate state of Maharashtra.
	Paper IV: History of India (1757-1857)	• Acquaint himself with significant events leading to establishment of the rule of East India Company. • Know the colonial policy adopted by the company to consolidate its rule in India. • Understand the structural changes initiated by colonial rule in Indian economy. • Explain the various revolts against rule of the East India Company.
	Paper- V History of Modern Maharashtra (1960-2000)	• Acquaint himself with the contribution of eminent leaders of Maharashtra. • Know about the economic transformation of Maharashtra. • Understand the salient features of changes in society. • Explain the growth of education.
	Paper- VI: History of Freedom Struggle (1858-1947)	• Understand the events which lead to the growth of nationalism in India. • Acquaint himself with major events of the freedom struggle under the leadership of Mahatma Gandhi. • Explain the contribution of Revolutionaries, Left Movement and Indian National Army. • Know the concept of Communalism and the causes and effects of the partition of India.
B.A.- III	Paper No. VII History of Ancient India (From Prehistory to 3rd c. BC)	• Aware about Indian reach heritage. • Explain the civilization of Indus valley. • Know the concept of Jainism and its contribution in development of Indian society.
	Paper No. VIII Political History of Medieval India (1206 to 1707 A.D.)	• Know the sources of medieval Indian history. • Understand the role of Sultans in building as a nation. • Acquaint himself with work and administration of Mughal Empire. • Know the Provincial Rulers and their policy.
	Paper No. IX India Since Independence –I	• Know the contribution of Major National leaders in congress Party. • Understand the role of congress party in development of the nation. • Explain the Agricultural development after independence. • To give information about the industrial development in India.
	Paper No. X History of the Marathas (1707-1818)	• To give knowledge of the Expansion of Maratha Empire through all over India and decline of Maratha Empire.
	Paper No. XI	• To give knowledge of process of History writing.

	Introduction to Historiography	• Understand the concept and kinds of History, • Know the different tools and sources of writing history. • know the acquisition of historical data.
	Paper No. XII History of Ancient India (From 3 c. BC to 7th c. AD)	• Know the Major kings and their achievements in the Sata vahanas and Kushanas Kingdom. • Understand the developments of art and culture in the Gupta and Vakataka period. • know the Chalukya, Pallavas, and vardhanas contribution in Indian culture. • know the meaning and nature of Archaeology, Iconography, Epigraphy, Numismatics.
	Paper No. XIII Socio-Economic and Cultural History of Medieval India (1206 to 1707 A. D.)	• Acquaint himself about Agricultural and rural economy in the medieval India. • Understand the different types of industries and trades in medieval India. • Know the prosperous religious movement and its contribution in the Indian society, • Feel proud about rich development in architecture, music, painting and dance of India.
	Paper No. XIV India Since independence-II	• Know the foreign policy of India. • Understand the Problems occurring after independence. • Acquaint himself with Environmental movements, women movements and movements of depressed classes. • Understand the concept of Globalization, Liberalization and Privatization.
	Paper No. XV Modern Maharashtra (1960 to 2000)	• Understand the Formation of Maharashtra and work of the Sanyukta Maharashtra movement • Know the Changes in Agriculture, industry and trade in the modern Maharashtra. • Understand the Social movement with special reference to western Maharashtra. • Acquaint himself with reach culture and heritage of Maharashtra.
	Paper No. XVI Applications of History	• Understand the Application of history in different fields. • Know the concept of Tourism and different tourist places in India. • understand the importance of Conservation and Preservation of historical documents. • Know the career opportunities in the history.

Department of English

Program Name	Title of Course/ Paper	Course Outcome By the end of each of the following course, the students will be able to:
B A Part I Optional English	Paper I: Modern Indian Writing in English Translation	• At the end of the course graduates will/ will be able: • Get acquainted with translated Modern Indian literature in English. • Get introduced to short story as a form of literature with reference to the texts prescribed. • To develop literary competency.
	Paper II: Modern Indian Writing in English Translation	• At the end of the course graduates will/ will be able: • Get acquainted with translated Modern Indian literature in English. • Get introduced to short story as a form of literature with reference to the texts prescribed. • To develop literary competency.
B A Part II Optional English	Paper IV: Partition Literature	• To create an awareness of the partition scenario among the students • To explain the hidden human dimensions of the partition to the students • To elaborate on the impact of partition on society
	Paper VII: Partition Literature	• To create an awareness of the partition scenario among the students • To explain the hidden human dimensions of the partition to the students • To elaborate on the impact of partition on society
B A Part III Special English	Paper VII: Literary Criticism and Critical Appreciation	• Get introduced to the major trends in literary criticism • To familiarize with the major critical concepts • To study the original contributions to literary criticism • To acquaint with the various literary movements • To write critical appreciation of poetry •
B A Part III Special English	Paper XII: Literary Criticism and Critical Appreciation	• Get introduced to the major trends in literary criticism • To familiarize with the major critical concepts • To study the original contributions to

		literary criticism • To acquaint with the various literary movements • To write critical appreciation of poetry •
	Paper VIII: Understanding Poetry	• Will be engaged and curious readers of poetry • Introduced to poetry form various cultures and traditions • To understand that poetry gives intellectual, moral and linguistic pleasures
	Paper XIII: Understanding Poetry	• Will be engaged and curious readers of poetry • Introduced to poetry form various cultures and traditions • To understand that poetry gives intellectual, moral and linguistic pleasures
	Paper IX: Understanding Drama	• Study the drama as a genre. • Analyze the characteristics of drama. • Identify various themes of drama.
	Paper XIV: Understanding Drama	• Study the drama as a genre. • Analyze the characteristics of drama. • Identify various themes of drama.
	Paper X: Understanding Novel	• Study the history, origin of the novel as a genre. • Study various types of novels. • Identify various components of novel.
	Paper XV: Understanding Novel	• Review the history and origin of the Indian English novel as a genre. • Study campus novel and trans fiction. • Identify various components of novel.
	Paper XV: The structure of Modern English	• Get acquainted with the nature, scope and branches of English. • Get introduced major concepts in Modern English • Acquire and modify the knowledge of sounds in English. • To develop linguistic competency
	Paper XVI: The structure of Modern English	• Get acquainted with the nature, scope and branches of English. • Get introduced major concepts in Modern English • Acquire and modify the knowledge of sounds in English. • To develop linguistic competency
M. A.I English	C1: Poetry in English	• At the end of the course graduating

	up to 19th Century	seniors will/ will be able: • To get the knowledge of various themes of Poetry in English. • To interpret poems with the help of critical thinking.
	C2: Fiction in English up to 19thCentury	• To get the knowledge of various themes of fiction in English. • To analyze various techniques of narration and writing.
	C3: Introduction to Modern Linguistics	• To get competence of linguistics. • To utilize the knowledge of grammar, morphology, stylistics etc. • To review Indian and western schools of linguistics.
	E1: American Literature	• To understand various trends and traditions of American Literature. • To get a better comprehension of literary, societal, cultural, biographical and historical background of the greatest writings in American Literature
	C4: Poetry in English: Modern and Postmodern	• To understand various themes and aspects of modern and postmodern poetry. • To understand poetry as a genre of literature.
	C5: Poetry in English: Modern and Postmodern	• To understand various themes and aspects of modern and postmodern poetry. • To understand poetry as a genre of literature.
	C6: Sociolinguistics and Stylistics	• To identify different aspects like dialect, register, jargon, functional usage of English etc. • To get acquainted with stylistic devices in use. • To make use of Stylistics in their day to day usage of English.
	E1: American Literature	• To understand various trends and traditions of American Literature • To get a better comprehension of literary, societal, cultural, biographical and historical background of the greatest writings in American Literature.
	C7: Drama in English up to 19th Century	• Know about the distinct literary characteristics of drama, emphasizing the changing approaches to theater as well as the social, cultural, and philosophical implications in the plays.

	C8: Critical Theory-I	• To understand various approaches towards literary work of art. • To apply critical frameworks to analyze the literary work in social, structural and psychological contexts.
M. A. II English	E3: American Literature- Modern	• To get a better comprehension of literary, societal, cultural, biographical and historical background of the greatest writings in Modern American Literature.
	E4: American Literature-Post modern	• To get a better comprehension of literary, societal, cultural, biographical and historical background of the greatest writings in Postmodern American Literature.
	C9: Drama in English: Modern and Postmodern	• Know about the distinct literary characteristics of drama, emphasizing the modern and postmodern approaches to theater as well as the social, cultural, and philosophical implications in the plays.
	C10: Critical Theories	• To understand various approaches towards literary work of art. • To apply critical frameworks to analyze the literary work in various contexts.
	E5: American Literature-Hemingway	• To understand various themes and traditions in the select works of Ernest Hemingway
	E6: American literature-Women writers	• To understand the approaches of women writers, feminism and other trends in the writings of women.
B.A. PART1	Paper –A ENGLISH FOR COMMUNICATION (COMPULSORY)	• At the end of the course graduates will be able: • Acquaint various communication skills. • Inculcate human values among the students through poems and prose. •
	Paper –B ENGLISH FOR COMMUNICATION (COMPULSORY)	• Improve the language competence. • Able to use English for general purposes.

B.A PART 2	Paper –C ENGLISH FOR COMMUNICATION (COMPULSORY)	• Improve the language competence. • Able to use English for general purposes. •
	Paper –D ENGLISH FOR COMMUNICATION (COMPULSORY)	• Acquaint various communication skills. • Inculcate human values among the students through poems and prose.
B.A.PART 3	PAPER AECC 5 -	• Communicate in English, in oral and

	ENGLISH FOR COMMUNICATION (COMPULSORY)	written modes in their day to day lives as well as at workplaces. • Learn group behavior and team work. • Face job interviews confidently and efficiently.
	PAPER AECC 6 - ENGLISH FOR COMMUNICATION (COMPULSORY)	• Acquire professional skills required in media writing. • Acquire human values and develop cultured outlook. • Learn to appreciate and enjoy reading poetry and prose passages.
B.SC.PART1	PAPER A - ENGLISH FOR COMMUNICATION (COMPULSORY)	• At the end of the course graduates will be able: • Acquaint and equip with communication skills. • Inculcate human values among the students through poems and prose.
B.SC.PART 3	PAPER B - ENGLISH FOR COMMUNICATION (COMPULSORY)	• Improve the language competence of the students. • Improve the media communication skills.
	Paper AECC C ENGLISH FOR COMMUNICATION (COMPULSORY)	• Communicate in English, in oral and written modes in their day to day lives as well as at workplaces. • Learn group behavior and team work. • Face job interviews confidently and efficiently.
	Paper AECC D ENGLISH FOR COMMUNICATION (COMPULSORY)	• Acquire professional skills required in media writing. • Acquire human values and develop cultured outlook. • Learn to appreciate and enjoy reading poetry and prose passages.

B.C.S.PART 1	Paper AECC A ENGLISH FOR COMMUNICATION (COMPULSORY)	• At the end of the course graduates will be able: • Acquaint and equip with communication skills. • Inculcate human values among the students through poems and prose.
	Paper AECC B ENGLISH FOR COMMUNICATION (COMPULSORY)	• Improve the language competence of the students. • Improve the media communication skills.

Department of Hindi

Program Name	Course	Outcomes By the end of each of the following course, the students will be able to:
B.A.I	अनिवार्य हिंदी	
	सत्र I	हिंदी भाषा तथा व्याकरण का अध्ययन कराना।
	सत्र II	हिंदी के विविध रुपों का परिचय कराना।
	ऐच्छिक हिंदी सत्र I	छात्रों की हिंदी साहित्य के प्रति रूचि बढ़ाना तथा छात्रों को साहित्य की विविध विधाओं से परिचित कराना।
	सत्र II	छात्रों को हिंदी के प्रतिनिधि गद्यकारों एवं कवियों से परिचित कराना।
B.A. II	सत्र III	
	प्रश्नपत्रIII अस्मितामूलक विमर्श और हिंदी गद्य साहित्य	कथा साहित्य का स्वरूप, तत्त्व और साहित्य का अध्ययन कराना।
	प्रश्नपत्रIV हिंदी संत काव्य तथा राष्ट्रीय काव्यधारा	छात्रों की हिंदी साहित्य के प्रति रूचि बढ़ाना तथा छात्रों को साहित्य की विविध विधाओं से परिचित कराना।
	सत्र IV	
	प्रश्नपत्र V रोजगार परक हिंदी	छात्रों को हिंदी में कार्य करने की विचार क्षमता, कल्पनाशीलता एवं रुचि विकसित करना।
	प्रश्नपत्र VI अस्मितामूलक विमर्श और हिंदी पद्य साहित्य	छात्रों को हिंदी कवियों से परिचित कराना।
B.A.III	सत्र V	
	प्रश्नपत्रVII विधा विशेष का अध्यन	उपन्यास और आत्मकथा के तात्विक स्वरूप का परिचय देना।
	सत्र VI	पाठ्यक्रम में निर्धारित उपन्यास एवं आत्मकथन की
	प्रश्नपत्र XII विधा विशेष का अध्यन	प्रासंगिकता से अवगत कराना।
	सत्र V	
	प्रश्नपत्र VIII साहित्यशास्त्र	साहित्य की मर्म ग्राहिणी क्षमता का विकास कराना।
	सत्र VI	
	प्रश्नपत्र XIII साहित्यशास्त्र	साहित्य समीक्षा की दृष्टि विकसित कराना।

	सत्र V	
	प्रश्नपत्रIX हिंदी साहित्य का इतिहास (सन 2000 इ.स.तक)	हिंदी साहित्य के इतिहास से छात्रों को अवगत कराना।
	सत्र VI	
	प्रश्नपत्रXIV हिंदी साहित्य का इतिहास (सन 2000 इ.स.तक)	हिंदी साहित्य के इतिहास से छात्रों को अवगत कराना।
	सत्र V	
	प्रश्नपत्रX प्रयोजन मूलक हिंदी	प्रयोजनमूलक हिंदी के विविध रुपों से अवगत कराना।
	सत्र VI	
	प्रश्नपत्रXV प्रयोजन मूलक हिंदी	प्रयोजनमूलक हिंदी के विविध रुपों से अवगत कराना।
	सत्र V	
	प्रश्नपत्रXI भाषाविज्ञान और हिंदी भाषा	भाषा के विविध रूपों का परिचय कराना।
	सत्र VI प्रश्नपत्रXVI भाषाविज्ञान और हिंदी भाषा	मानक हिंदी वर्तनी और व्याकरण से छात्रो को परिचित कराना।
M.A. I	सत्र I	
	प्रश्नपत्र I- प्राचीन तथा निर्गुण भक्तिकाव्य	प्राचीन तथा मध्ययुगीन कवियों एवं उनकी कृतियों से परिचित कराना।
	सत्र II	
	प्रश्नपत्र V- सगुण भक्तिकाव्य एवं रीतिकाव्य	युगीन परिवेश तथा काव्य प्रवृत्तियों से परिचित कराना।
	सत्र I	
	प्रश्नपत्र II- हिंदी साहित्य का इतिहास	साहित्य इतिहास के लेखन की आवश्यकता तथा महत्त्व से परिचित कराना।
	सत्र II	
	प्रश्नपत्र VI- हिंदी साहित्य का इतिहास	आधुनिक कालीन हिंदी के युगीन परिवेश का अध्ययन कराना।
	सत्र I	
	प्रश्नपत्र III- भाषाविज्ञान- I	भाषा के स्वरूप तथा भाषा के विभिन्न रुपों से परिचित कराना।
	सत्र II	
	प्रश्नपत्र VII- भाषाविज्ञान- II	भाषा विज्ञान के विविध शाखाओं से परिचित कराना ।

	सत्र I	
	प्रश्नपत्र IV वैयकल्पिक प्रश्नपत्र अनुवाद प्राद्यौगिकी -I	अनुवाद का सैध्दांतिक परिचय कराना।
	सत्र II	
	प्रश्नपत्र VIII वैयकल्पिक प्रश्नपत्र अनुवाद प्राद्यौगिकी -II	अनुवाद की उपयोगिता तथा महत्त्व से परिचित कराना।

M.A. II	सत्र III	
	प्रश्नपत्र IX- आधुनिक हिंदी कविता-I	छात्रों को आधुनिक हिंदी कविता की प्रवृत्तियों से परिचित कराना।
	सत्र IV	
	प्रश्नपत्र XIII- आधुनिक हिंदी कविता-II	छात्रों को नई कविता के गद्य-पद्यात्मक काव्यशैलीसे परिचित कराना।
	सत्र III	
	प्रश्नपत्र X- भारतीय काव्यवशास्त्र तथा हिंदी अलोचना	छात्रों को भारतीय तथा पाश्चात्य काव्यशास्त्र से परिचित कराना।
	सत्र IV	
	प्रश्नपत्र XIV- पाश्चात्य काव्यशास्त्र	पाश्चात्य काव्यशास्त्र के विविध सिध्दांतों से परिचित कराना।
	सत्र III	
	प्रश्नपत्र XI- प्रयोजनमूलक हिंदी	छात्रों को प्रयोजनमूलक हिंदी की संकल्पना, स्वरूप, एवं उपयोगिता से अवगत कराना।
	सत्र IV	
	प्रश्नपत्र XV प्रयोजनमूलक हिंदी	संगणकीय हिंदी के सामान्य स्वरूप से ज्ञात कराना।
	सत्र III	
	प्रश्नपत्र XII ब) अनुवाद प्राद्यौगिकी -III अनुवाद प्राद्यौगिकी -I	अनुवाद का एक स्वतंत्र साहित्य विधा के रूप में महत्त्व जानना।
	सत्र II	
	प्रश्नपत्र VIII वैयकल्पिक प्रश्नपत्र अनुवाद प्राद्यौगिकी -II	अनुवाद की उपयोगिता तथा महत्त्व से परिचित कराना।
	प्रश्नपत्र IX प्रश्नपत्र - XVI अनुवाद प्राद्यौगिकी -IV	अनुवाद का स्वतंत्रविधा के रुप में महत्त्व जानना।

Department of Sanskrit

Program Name	Title of Course/ Paper	Course Outcome By the end of each of the following course, the students will be able to:
B.A. I	Paper I	• Students will learn Kalidasa's work which is appreciated by renowned poets. • Students will learn morals of Raghu as a successful leader through the selected portion. • Students will come to know the moral characters to be possessed by successful leader. • Students will perform practical exercises to improve language skills. • Basic reading, speaking and creative writing ability amongst the students will be enhanced. • Students will learn Kiratarjuniyam as a composition of Bharavi. • Students will learn the text dealing with the role of messenger. • Students will learn implementation of communication skills with precision in description and power of convincing interpretations as required for good messenger and effective communicator on large.
	Paper II	• Students will learn the origin and development of Drama as a creative and communicative literary expression • Students will learn one poet in detail with his work and biography. • One work of concerned poet will be studied by students in detail. • Students will learn characteristics of Drama standardized so far in Sanskrit literature.
B.A. II	Paper III	• Students will learn drama named Swapna-vasava-dattam as one creative expression of poet.
	Paper IV	• Students will learn Indian Vedantic Philosophical base through text of Bhagvadgeeta.
	Paper V	• Students will learn basics of Paninian Sanskrit Grammer.
	Paper VI	• Students will be introduced to Morals through Niti Shatakam Text

B.A. III	Paper VII	• Students will get acquainted with culture of ancient India through hymns of Vedas.
	Paper VIII	• Students will learn abstract of all Upanishads in one text of Vedantasar.
	Paper IX	• Students will learn logic of ancient India.
	Paper X	• Students will get acquainted with power of words, figure of speech. • Creative writing ability will be enhanced.
	Paper XI	• Students will learn archaeology. • Will learn the skill of reading manuscripts.
	Paper XII	• Students will learn Bhrahmana and upanishadic texts
	Paper XIII	• Students will come to know about Smriti texts.
	Paper XIV	• Students will come to know our culture and heritage through the knowledge of Vedic historical text
	Paper XV	• Students will learn practical views towards life through the composition of Pt. Jagannath
	Paper XVI	• Students will learn basic grammar of Paninian style.
M A COURSE OUTCOMES MA Part I	Paper I: Veda Vangmaya	• Students will become well versed with knowledge of Vedic compositions. • Students will be able to tackle the portion of Vedas in UGC-NET Examination
	Paper II: Vyakarana Parichaya	• Students will know the basic reasons and need to learn Sanskrit language grammar • They will be familiarized with Philosophical approach towards Sanskrit language. • Students will be competent to deal with questions based on this syllabus in UGC-NET Examination
	Paper III: Arthasamgraha	• After studying this text students will understand the concept of Dharma in rituals of YADNYA • They will come to know the methodology of performance of Yadnic rituals • They will learn how the critical arguments are carried out in Shastra literature of Sanskrit • Students will have enough knowledge to deal with this portion in UGC-NET Examination
	Paper IV: Natak: Mudrarakshasa	• Students.will come to know how the politics is rendered through the piece of literature with the example of this drama

		• Students will learn the lingual and diplomatic skills in script writing of such kind of political drama • This will help students towards completion of their UGC-NET preparations.
	Paper V: Vaidic Vangmaya:	• The students will be acquainted with fundamentals and structure of six Vedangas • With further progression in this knowledge students can attain the ability to decode Vedas • Students will be competent to deal with questions based on this syllabus in UGC-NET Examination.
	Paper VI: Bhasha Vidnyana	• Linguistics is growing science of language. Sanskrit students will learn ancient linguistics. • They will develop analytical approach to study the language. • They will understand origin and development of language. • Students will have enough knowledge to deal with this portion in UGC-NET Examination.
	Paper VII: Samkhya	• Students will be introduced to ancient philosophy of Indian philosophy stream. • Samkhya and Yoga are two branches of Knowledge. Samkhya is theory and Yoga is practical. • Students will learn Indian philosophy and basic principles of Samkhya. • Students will be competent to deal with questions based on this syllabus in UGC-NET Examination.
	Paper VIII: History of Ayurveda	• Students will learn Ayurveda as a science of ancient Indian medicines. • Students will get acquainted with basics of Health and diet • Students will learn simple Ayurvedic formulations routinely used as home remedies.
M. A. II	Paper IX	• Students will learn different views of Sanskrit poets.
	Paper X	• Study of an epic will be introduced to students through this paper.
	Paper XI	• Students will learn Vedanta Philosophy through this paper.
	Paper XII	• Students will learn philosophy of Yoga through Patanjala Yoga Darshan.
	Paper XIII	• Students will learn about history of Sanskrit

		literature.
	Paper XIV	• Students will learn about drama as an example of Sanskrit literature.
	Paper XV	• Students will learn two atheistic philosophy.
	Paper XVI	• Students will learn about good health and Yoga.

Department of Environmental Science

Program Name	Course Name/ paper	Course Outcome
B. Sc. II B.A. II B.C.S. II	Environmental Studies	• After theoretical knowledge, through project work, students are interacting with various local environmental problems and also with control measures taken for the protection of the environment. Students are working on variety of numerous project topics which are survey based and strictly follow research method. Thus, students are enriched with many skills which are very useful in solving environmental problems and in conservation of the natural resources, which in turn will balance socio-economic conditions of the area. • As a result, student's evaluation ability for identification of environmental problem is well developing. After identification of the problem, in the form of methodology students are working out a plan for data collection, are giving actual visit to study area, interacting with various sections of the society, are analyzing and concluding the situation. • While doing project work all the students are referring many reference books, research papers, opinions of subject experts, NGO's, and local people. They are also analyzing reports of local civic bodies and news from local newspapers. • In near future, all the students will be working towards the resolution of environmental problems and definitely will achieve sustainable development goals. • By achieving above said objectives, at individual level students are becoming more self-confident. Thus, they can tackle any situation and can find proper solutions to any problems. Thus, they will be exhibiting set of values and will also become good administrators and researchers.

Willingdon College Sangli

Principal
Principal,
Willingdon College, Sangli.