



Koneru Lakshmaiah Education Foundation

(Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

Accredited by NAAC as 'A' Grade University Approved by AICTE ISO 9001-2015 Certified

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DEPARTMENT OF BIOTECHNOLOGY

B.TECH-BT

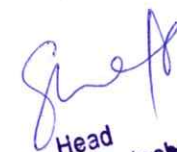
ACADEMIC YEAR: 2018-2019

| S No | Course Code | Course Title | CO NO. | Description of the Course Outcome |
|------|-------------|-----------------------------------|--------|---|
| 1 | 18UC1101 | INTEGRATED PROFESSIONAL SKILLS | C01 | Understand the concepts of grammar to improve communication, reading, and writing skills |
| | | | C02 | Demonstrate required knowledge over Dos and Don'ts of speaking in the corporate context. Demonstrate ability to face formal situations / interactions. |
| | | | C03 | Understand the varieties of reading and comprehend the tone and style of the author. Skim and scan effectively and appreciate rhetorical devices |
| | | | C04 | Apply the concepts of writing to draft corporate letters, emails, and memos |
| 2 | 18UC1182 | ENGLISH PROFICIENCY | C01 | Demonstrating different interpersonal skills for employability |
| | | | C02 | Distinguishing business essential skills |
| | | | C03 | Classifying social media and corporate communication skills |
| | | | C04 | Applying analytical thinking skills |
| 3 | 18UC2103 | PROFESSIONAL COMMUNICATION SKILLS | C01 | Developing critical and analytical reading skills |
| | | | C02 | Discovering different interpersonal skills to develop people skills |
| | | | C03 | To enhance the problem-solving skills of the students through the concepts of Simple Equations, Ratio, Proportion & Variation, Percentages, Profit & Loss, Averages, Allegations, Simple & Compound Interest. |
| | | | C04 | Apply diagrammatic representation of the given data to find the possible outcomes in the topics of Deductions, Cubes, Venn Diagrams and Arrangements |
| | | | C05 | To apply deductive logic to solve questions in Connectives, Blood relations, Ranking and time sequence, Symbols and notations. Apply principles of reflection and rotation to solve picture puzzles. |

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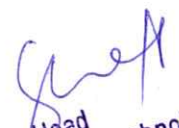
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| 4 | 18UC2184 | CORPORATE COMMUNICATION SKILLS | CO1 | To distinguish product and process and quote them in speaking and writing activities |
| | | | CO2 | To apply interpersonal skills |
| | | | CO3 | To enhance the problem-solving skills of the students through the concepts of Numbers, Time & Work, Time & Distance, Permutations & Combinations, Probability which will enable them to improve their problem solving abilities which in turn improve their programming skills. |
| | | | CO4 | To apply known facts to find the unknowns in the topics Clocks, Calendars, Binary Logic. Identify the rule set by analyzing the given observations in the topics Series, Analogy, Odd Man, Coding-Decoding |
| 5 | 18UC3005 | APTITUDE BUILDER | CO1 | To discuss and interpret English language skills necessary for placements |
| | | | CO2 | To demonstrate skills to get selected in interviews and retain job |
| | | | CO3 | To enhance the problem-solving skills of the students through the concepts of Menstruation, Quadratic Equations & Inequalities, Progressions, Logarithms, Data Interpretation, Data Sufficiency which will enable them to improve their problem- solving abilities which in turn improve their programming skills. |
| | | | CO4 | To apply deductive logic to solve questions in Connectives, Blood relations, Ranking and time sequence, Symbols and notations. Apply principles of reflection and rotation to solve picture puzzles. |
| 6 | 18UC0007 | INDIAN HERITAE AND CULTURE | CO1 | To familiarize with various aspects of the culture and heritage of India through ages |
| | | | CO2 | To acquaint with the contributions of Indians in the areas of languages and literature, religion and philosophy |
| | | | CO3 | To understand the Social structure and the spread of Indian culture abroad |
| | | | CO4 | To know the development of Science and Technology in India through ages and to appreciate the contributions of some of the great Indian scientists |




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| 7 | 18UC0008 | INDIAN CONSTITUTION | CO1 | To understand Constitutional development after Independence |
| | | | CO2 | To learn the fundamental features of the Indian Constitution |
| | | | CO3 | To get a brief idea of the powers and functions of Union and State Governments |
| | | | CO4 | To understand the basics of working of Indian Judiciary and the Election Commission |
| 8 | 18UC0009 | ECOLOGY AND ENVIRONMENT | CO1 | Understand the importance of Environmental education and conservation of natural resources. |
| | | | CO2 | Understand the importance of ecosystems and biodiversity |
| | | | CO3 | Apply the environmental science knowledge on solid waste management, disaster management and EIA process |
| | | | CO4 | Understand the importance of Environmental education and conservation of natural resources |
| 9 | 18UC0010 | UNIVERSAL HUMAN VALUES & PROFESSIONAL ETHICS | CO1 | Understand and identify the basic aspiration of human beings |
| | | | CO2 | Envisage the roadmap to fulfill the basic aspiration of human beings. |
| | | | CO3 | Analyze the profession and his role in this existence. |
| 10 | 18UC0011 | ENTREPRENEURSHIP | CO1 | Analyze the business environment in order to identify business opportunities, |
| | | | CO2 | Identify the elements of success of entrepreneurial ventures |
| | | | CO3 | Consider the legal and financial conditions for starting a business venture |
| | | | CO4 | Evaluate the effectiveness of different entrepreneurial strategies |


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| 11 | 18MT1101 | MATHEMATICS FOR COMPUTING | CO1 | Model a system of equations for real world applications in engineering, physical and biological sciences, computer science, finance, economics and solve them through matrix algebra |
| | | | CO2 | Model basic and computational techniques on discrete structures like relations, orders, functions & FSM, Lattices, and propositional & predicate logic Model real world structures and their related |
| | | | CO3 | Applications using advanced discrete structures like graphs and trees. Model the given Statistical data for real world |
| | | | CO4 | Applications in Engineering science, Economics and Management. |
| | | | CO5 | Demonstrate the Aptitude and Reasoning skills (Tests in skilling hours) |
| 12 | 18SC1102 | INTRODUCTION TO DESIGN | CO1 | Be able to understand elements and principles of design |
| | | | CO2 | Able to grasp stage model of action cycle |
| | | | CO3 | Be able to understand design laws and their importance in design field |
| | | | CO4 | To comprehend various rules of composition of design |
| | | | CO5 | To gain hands-on experience of fundamentals of design |
| 13 | 18MT2102 | MATHEMATICS FOR ENGINEERS | CO1 | Apply differential and integral calculus to find maxima & minima of functions, evaluate the integrals and solve the differential equations. |
| | | | CO2 | Demonstrate the Fourier series and Laplace transforms. |
| | | | CO3 | Describe probability, Random Variables |
| | | | CO4 | Explain complex variables, analytic functions and introduction to stochastic process and Algebraic structures. |


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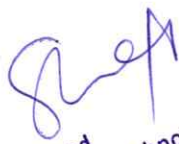
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| 14 | 18PH1010 | MECHANICS | C01 | Apply the concept of forces, governing static equations and analyze planer system of forces. |
| | | | C02 | Use analytical techniques for analyzing forces in statically determinate structures. |
| | | | C03 | Understanding the concepts of planar and non- planar system of parallel forces and analyzing them. Estimate moment of inertia of lamina and material bodies |
| | | | C04 | Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems |
| 15 | 18SC1183 | USER CENTRIC DESIGN TECHNIQUES | C01 | Understand the different roles and responsibilities in phases of User centered Design |
| | | | C02 | Identify user pain points and opportunity areas through empathy and collaborative design |
| | | | C03 | To be able to design a better User Experience using UCD and 6D process |
| 16 | 18SC2104 | DESIGN THINKING AND INNOVATION | C01 | Understand the basics of design thinking and its implications in product or service development |
| | | | C02 | Understand and Analyze the requirements of a typical problem |
| | | | C03 | Plan the necessary activities towards solving the problem through ideation and prototyping |
| | | | C04 | evaluate the solution and refine them based on the customer feedback |
| 17 | 18PH1807 | MATERIALS FOR MECHANICAL ENGINEERING APPLICATIONS | C01 | Understand crystal structures and also to find lattice parameters using different XRD techniques |
| | | | C02 | Understand different heat treatment processes and also understand the properties of smart materials |
| | | | C03 | Understand different types of semiconducting materials and ceramic materials |
| | | | C04 | Understand different types of composite materials and nano materials and its applications |

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| 18 | 18SC1101 | COMPUTATIONAL THINKING FOR DESIGN | CO1 | Design Basic and Complex Building Blocks for real world problems using structured programming paradigm. |
| | | | CO2 | Translate computational thinking into Logic Design for Solving real world problems. |
| | | | CO3 | Apply and Analyse CRUD operations on Basic Data Structures using Asymptotic Notations. |
| | | | CO4 | Apply and Analyse CRUD operations on Linear Data Structures using Asymptotic Notations. |
| | | | CO5 | Apply the structured programming paradigm with logic building skills on Basic and Linear Data Structures for solving real world problems. |
| 19 | 18ME1103 | DESIGN TOOLS WORKSHOP -I | CO1 | Practice design thinking by developing artistic skills, Visualize and complete his/her innovative design by final drafting using 3D modeling |
| | | | CO2 | Understand the concept of web page, web browser, web server, and able to create Static webpages |
| | | | CO3 | Understand the concept of report writing using a markup language Latex |
| | | | CO4 | Understand the concept of data visualization and creating data visualization dashboards, Understand the basic concept of VR/AR. |
| 20 | 18SC1182 | DATA STRUCTURES | CO1 | Apply measures of efficiency to algorithms and Compare various linear data structures like Stack ADT, Queue ADT, Linked lists. |
| | | | CO2 | Analyze and compare linear data structures and analyze different searching and hashing techniques |
| | | | CO3 | Analyze and compare various non – linear data structures like Trees and Graphs |
| | | | CO4 | Analyze and compare various sorting algorithms, to select from a range of possible options, to provide justification for that selection, and to implement the algorithm in a particular context. |
| | | | CO5 | Execute lab experiments and develop a small project along with his/her team members. |

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| 21 | 18SC1189 | DESIGN TOOLS WORKSHOP -II | CO1 | Practice the design ideology by artistic skill |
| | | | CO2 | Visualize the design ideology by using VR technology |
| | | | CO3 | Visualize the design ideology by incorporating VR technique |
| | | | CO4 | Visualize and present his design idea by applying AR technique |
| 22 | 18BT1181 | CELL BIOLOGY | CO 1 | Acquire the knowledge of cell and Nuclear Organization |
| | | | CO 2 | Compare Cell division and cell cycle |
| | | | CO 3 | Acquire the knowledge of tissues and Receptors |
| | | | CO 4 | Understand membrane Structure |
| 23 | 18ES2101 | PROCESS ENGINEERING PRINCIPLES | CO1 | Describe the engineering calculations in Bioprocess Technology principles. |
| | | | CO2 | Employ the basic principles of ideal gas law for measuring no. of moles of various solutions |
| | | | CO3 | Employ the basic principles of material balance of a various reaction systems and Estimate the chemical and microbial kinetic parameters for better biomass and product formation e |
| | | | CO4 | Employ the basic principles of Energy balance of a various reaction systems and Estimate the chemical and microbial kinetic parameters for better biomass and product formation |


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| 24 | 18ES2103 | BIOCHEMICAL THERMODYNAMICS | CO 1 | Acquire the knowledge of terminology and zeroth, first laws of thermodynamics. |
| | | | CO 2 | Determine entropy changes and apply second law of thermodynamics. |
| | | | CO 3 | Compute thermodynamic properties for fluids. |
| | | | CO 4 | Apply chemical engineering thermodynamics to phase and reaction equilibria and design thermodynamic models for microbial growth. |
| 25 | 18ES2102 | TRANSPORT PROCESS IN BIOLOGICAL SYSTEMS | CO 1 | Apply principles of momentum transfer in biological systems |
| | | | CO 2 | Apply principles of Heat Transfer in Biological systems |
| | | | CO 3 | apply principles of Mass Transfer in Biological systems |
| | | | CO 4 | Apply separation and purification unit operations in biological products |
| | | | CO5 | Apply unit operations of momentum, heat and mass transfer in bio processing. |
| 26 | 18CY1101 | ENGINEERING CHEMISTRY | CO 1 | Describe some important design considerations in choosing a battery for a specific application. |
| | | | CO 2 | Predict potential complications from combining various chemicals or metals in an engineering setting |
| | | | CO 3 | Examine water quality and select appropriate purification technique for intended problem |
| | | | CO 4 | Explain the role of chemical kinetics in the formation and destruction of ozone in the atmosphere and predict the connection between molecular behaviour and observable physical properties. |
| | | | CO 5 | An ability to analyze & generate experimental skills |


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| 27 | 18PH1001 | ENGINEERING PHYSICS | C01 | Understands structure of crystalline solids, kinds of crystal imperfections and appreciates structure-property relationship in crystals. |
| | | | C02 | Understands the deformation of materials in response to action of load, for identification of materials having specific engineering applications. |
| | | | C03 | Understands the motion of electrons in microscopic level |
| | | | C04 | Understand the properties of light and engineering applications of lasers |
| | | | C05 | Apply the knowledge on structure and properties of materials while executing related experiments and develop some inter disciplinary projects |
| 28 | 18MT1811 | BIOSTATISTICS | C01 | Interpret numerical data through various graphs and determination of various constants of the data |
| | | | C02 | Measure and estimate the degree of linear relationship between two variables |
| | | | C03 | Identify the suitable probability distribution to the given experimental data and calculation of various characteristics of the respective probability distributions |
| | | | C04 | Draw the statistical inference of the given data through various tests of statistical hypothesis, viz., tests for means (single and two), analysis of variance |
| 29 | 18BT2105 | BIOCHEMISTRY | C01 | Understand the functions and properties of bio molecules (carbohydrates, nucleic acids, proteins, lipids) in biological systems. |
| | | | C02 | Understand the organization and biochemical reactions of bio molecules |
| | | | C03 | Understand the importance of various metabolic pathways |
| | | | C04 | Understand the importance of various biosignaling in biological systems |
| | | | C05 | Perform techniques used in biochemistry to address biochemical problems |


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| 30 | 18BT2106 | MICROBIOLOGY | CO 1 | Acquire the knowledge about chronological development, classification, cell structure, characteristics and diseases of microorganisms |
| | | | CO 2 | Construction of growth curve, identification of various factors affecting growth and outline about microbial growth estimation methods |
| | | | CO 3 | Compare various media, isolation, identification and sterilization methods of microorganisms |
| | | | CO 4 | Demonstrate various methods of microbiology such as sterilization, isolation, identification and characterization. |
| | | | CO5 | Apply various straining techniques for isolation of microbes from different sources. |
| 31 | 18BT2107 | BIOANALYTICAL TECHNIQUES | CO1 | Understand the basic principles of different bio analytical methods |
| | | | CO2 | Knowledge about techniques related to electrophoresis & spectroscopy |
| | | | CO3 | An understanding of use of Radioisotopes in biological sciences and its ethical issues |
| | | | CO4 | An ability to perform centrifugation, chromatography, electrophoresis & spectroscopy techniques |
| | | | CO5 | Analyze the methods for assay of bio molecules |
| 32 | 18BT2108 | MOLECULAR BIOLOGY | CO1 | Understand the genome organization & replication |
| | | | CO2 | Compare DNA transcription and translation mechanisms |
| | | | CO3 | Understand the gene regulation mechanisms |
| | | | CO4 | Apply the gene expression in bacteria |


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| 33 | 18BT2109 | IMMUNOLOGY | CO1 | Understand the various defense mechanism of body system |
| | | | CO2 | Compare different types of Ag-Ab reactions |
| | | | CO3 | Differentiate the role of B and T cells |
| | | | CO4 | Development of ELISA method for Ag-Ab reactions |
| | | | CO5 | Apply the various techniques for the vaccine production |
| 34 | 18BT3110 | BIOINFORMATICS | CO 1 | Acquire the theoretical basis of bioinformatics and understand the access and analyze the biological information from databases. |
| | | | CO 2 | Manipulate the DNA/protein sequences using standalone pc programs and with the help of the worldwide web. |
| | | | CO 3 | Apply multiple sequence alignment tools on gene and protein sequences to find homologs, construct and interpret the evolutionary trees. |
| | | | CO 4 | Use genome informatics tools and model protein three-dimensional structure of proteins. |
| | | | CO5 | Choose the sequences from the databases and apply sequence alignment, tree construction tools to infer their relations. |
| 35 | 18BT3111 | GENETIC ENGINEERING | CO1 | Understand the process of gene cloning |
| | | | CO2 | Apply the role of vectors in cloning process |
| | | | CO3 | Analyze various types of PCR |
| | | | CO4 | Compare various gene technology methods |
| | | | CO5 | Analyze cloning methods using recombinant molecules |

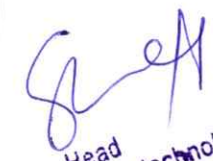
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| 36 | 18BT3112 | FERMENTATION TECHNOLOGY | C01 | Acquire the knowledge of fermentation process basics |
| | | | C02 | Understand the knowledge of medium optimization |
| | | | C03 | Acquire the knowledge of medium sterilization. |
| | | | C04 | Understand the principles of aeration and agitation |
| | | | C05 | Demonstrate fermentation processes to produce value added proteins and other biological substances for human, animal therapeutic use, food production processing and bio fuels. |
| 37 | 18BT3113 | BIOCHEMICAL REACTION ENGINEERING | C01 | Acquire the knowledge of reaction engineering basics and batch reaction system. |
| | | | C02 | Understand different bioreactor systems to analyze microbial growth and product formation. |
| | | | C03 | Compare various multiphase bioreactors |
| | | | C04 | Analyze biochemical processes for various biochemical parameters on microbial growth. |
| | | | C05 | Demonstrate processes to produce value added proteins and other biological substances for human, animal therapeutic use, food production processing and bio fuels. |
| 38 | 18BT3181 | PLANT AND ANIMAL BIOTECHNOLOGY | C0 1 | Acquire the knowledge of plant tissue culture and understand the principles and methods of plant genetic transformation. |
| | | | C0 2 | Apply concepts of genetic engineering and genome editing to molecular farming in plants |
| | | | C0 3 | Acquire the comprehension of animal cell culture principle and application and scale up of animal cell culture |
| | | | C0 4 | Apply the concepts of Transgenic Animals, Recombinant DNA Technology, and Tissue Engineering in Animal Biotechnology |
| | | | C0 5 | Apply tissue culture and genetic transformation in plant and cell culture techniques in animal cells |




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| 39 | 18BT3182 | DOWNSTREAM PROCESSING | CO1 | Acquire the knowledge of primary separation and recovery processes |
| | | | CO2 | Apply the principles of solid removal unit operations and product enrichment operations |
| | | | CO3 | Apply the principles of aqueous two-phase extraction process and product purification methods |
| | | | CO4 | Analyze the methods of alternative separation, product polishing and formulations |
| | | | CO5 | Evaluate the bioseparation methods for recovery, isolation and purification of various bioproducts |
| 40 | 18BT3051 | MOLECULAR GENETICS | CO 1 | Acquire the knowledge of Genome Organization & Types of Sequences and Recombination |
| | | | CO 2 | Describe about Gene Expression Regulation |
| | | | CO 3 | Compare X chromosome & Mt DNA analysis in Forensics |
| | | | CO4 | Compare Y Chromosome & Mt DNA analysis in Forensics |
| 41 | 18BT3052 | TRANSGENIC TECHNOLOGY | CO 1 | Acquire the knowledge of vehicles for transgenic technology and transgenic plants |
| | | | CO 2 | Describe transgenic animals and silencing technology |
| | | | CO 3 | Develop gene therapy |
| | | | CO4 | Develop knockouts strategies |

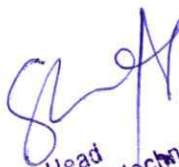


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| 42 | 18BT3053 | MOLECLAR EXPRESSION TECHNOLOGY | CO 1 | Acquire the knowledge of gene expression and Prokaryotic system- |
| | | | CO 2 | Describe mammalian system |
| | | | CO 3 | Develop various strategies of Protein purification system |
| | | | CO 4 | Develop various strategies of Protein stability |
| 43 | 18BT3054 | GENOMICS AND PROTEOMICS | CO 1 | Acquire the knowledge of Genomes |
| | | | CO 2 | Compare micro array analysis |
| | | | CO3 | Develop protein networks |
| | | | CO 4 | Develop mapping strategies |
| 44 | 18BT3055 | MOLECULAR MARKERS AND DIAGNOSTICS | CO1 | Acquire the Diagnosis of Viral & Bacterial diseases analysis |
| | | | CO2 | Understand Biochemical Disorders |
| | | | CO3 | Understand Immunodiagnostics and applications |
| | | | CO4 | Apply DNA based Diagnostics |
| 45 | 18BT3056 | GENE AND ENVIRONMENT | CO 1 | Acquire the knowledge of genes and its impact on environment |
| | | | CO 2 | Describe about environmental factors that damage DNA |
| | | | CO 3 | Compare detoxification and antioxidant defences |
| | | | CO4 | Compare stress genes from organisms |


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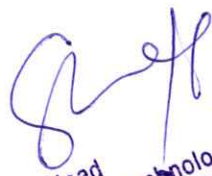
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| 46 | 18BT3057 | MOLECULAR GENETICS | CO 1 | Acquire the knowledge of Genome Organization & Types of Sequences and Recombination |
| | | | CO 2 | Describe about Gene Expression Regulation |
| | | | CO 3 | Compare X chromosome & Mt DNA analysis in Forensics |
| | | | CO 4 | Compare Y Chromosome & Mt DNA analysis in Forensics |
| 47 | 18BT3058 | DNA FORENSICS | CO 1 | Students will demonstrate an understanding of the principles and techniques used in DNA analysis for forensic purposes. |
| | | | CO 2 | Students will develop the skills to interpret DNA evidence collected from crime scenes or other forensic contexts. |
| | | | CO 3 | Students will gain an understanding of the legal and ethical considerations involved in DNA forensics |
| | | | CO 4 | Students will develop critical thinking and problem-solving skills through hands-on exercises and case studies in DNA forensics |
| 48 | 18BT3061 | MICROBIAL TECHNOLOGY | CO 1 | Acquire the knowledge of microbial technology |
| | | | CO 2 | Screen out medium and strain development |
| | | | CO 3 | Develop various strategies to produce Primary and secondary Metabolites |
| | | | CO 4 | Design various strategies to produce Enzymes, recombinant Proteins, and other special bio products. |
| 49 | 18BT3062 | PHARMACEUTICAL BIOTECHNOLOGY | CO 1 | Acquire the knowledge of Fundamentals of pharmaceutical Practice |
| | | | CO 2 | Asses the drug metabolism and pharmacokinetics and formulate pharmaceutical dosage & blood, plasma products |
| | | | CO 3 | Compare various Pharmaceutical products |
| | | | CO 4 | Develop various strategies of manufacturing processes |


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| 50 | 18BT3063 | METABOLIC ENGINEERING | CO 1 | Acquire the knowledge of Introduction of Metabolic Engineering |
| | | | CO 2 | Acquire the knowledge of Genetic improvement of strains |
| | | | CO 3 | Analyze metabolic pathways |
| | | | CO 4 | Develop experimental determination strategies of of Flux |
| 51 | 18BT3064 | BIORESOURCETECHNOLOGY | CO1 | Acquire the knowledge of Bioresources |
| | | | CO2 | Understand the knowledge of Biogas production |
| | | | CO3 | Describe the methods for Bioethanol and Biobutanol production |
| | | | CO4 | Describe the methods for Biodiesel production |
| 52 | 18BT3065 | BIOPROCESS ECONOMICS AND PLANT DESIGN | CO 1 | Understand basics of economic evaluation |
| | | | CO 2 | Acquire the knowledge of Bioprocess Economics |
| | | | CO 3 | Develop various strategies of process design |
| | | | CO 4 | Design various strategies of Basic considerations in equipment design and Basic Design Problems |
| 53 | 18BT3066 | ENZYME ENGINEERING | CO1 | Acquire the knowledge of terminology and classification of enzymes. |
| | | | CO2 | Understand the mechanisms of enzyme catalysis and action. |
| | | | CO3 | Evaluate the kinetics of enzyme parameters. |
| | | | CO4 | Understand the various industrial enzymes and their applications. |


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| 54 | 18BT3067 | BIOPROCESS VALIDATION AND cGMP | CO1 | Acquire the knowledge of terminology and classification of enzymes. |
| | | | CO2 | Understand the mechanisms of enzyme catalysis and action. |
| | | | CO3 | Evaluate the kinetics of enzyme parameters. |
| | | | CO4 | Understand the various industrial enzymes and their applications. |
| 55 | 18BT3068 | FOOD TECHNOLOGY | CO1 | Acquire the knowledge of food associated microbes |
| | | | CO2 | Describe food processing |
| | | | CO3 | Develop various strategies involved in preservation and storage |
| | | | CO4 | Conclude various principles involved in food microbiology |
| 56 | 18BT3072 | BIOMEDICAL INFORMATICS | CO 1 | Acquire the knowledge of web programming with Javascript |
| | | | CO 2 | Understand genomics role in informatics |
| | | | CO 3 | Analyze biochemical pathways |
| | | | CO 4 | Develop virtual Physiological Human; geometric models of proteins |
| 57 | 18BT3073 | PERL AND BIOPERL PROGRAMMING | CO 1 | Acquire the knowledge of an Introduction to Perl & Variables and Data Types |
| | | | CO 2 | Acquire the knowledge of Arrays and Hashes |
| | | | CO 3 | Describe Control Structures & String Manipulation and Input and Output- Program Parameters |
| | | | CO 4 | Develop various strategies involved in Bioperl |


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| 58 | 18BT3074 | MOLECULAR MODELLING AND DRUG DESIGN | CO 1 | Acquire the knowledge of Introduction to Molecular Modeling |
| | | | CO 2 | Describe the Basic concepts of Protein Modeling and Protein structure Determination |
| | | | CO 3 | Develop Molecular Dynamics and Simulations |
| | | | CO 4 | Design and construct Molecular modeling strategies in Drug Designing |
| 59 | 18BT3075 | STRUCTURAL BIOLOGY | CO 1 | Acquire the knowledge of Structural biology of Nucleic Acids |
| | | | CO 2 | Describe the Protein dynamics |
| | | | CO 3 | Compare various techniques for structural biology |
| | | | CO 4 | Conclude the principles involved in structure predictions and structural elucidation |
| 60 | 18BT3076 | SYSTEMS BIOLOGY | CO1 | Understand the network properties |
| | | | CO2 | Analyze regulatory network through systems biology software |
| | | | CO3 | Analyze Algorithms for biochemical network construction |
| | | | CO4 | Analyze Microarrays |
| 61 | 18BT3077 | APPLIED BIOINFORMATICS | CO 1 | Acquire the knowledge of genomics |
| | | | CO 2 | Describe the Protein dynamics |
| | | | CO 3 | Compare various techniques for applied bioinformatics |
| | | | CO 4 | Conclude the applications of system biology |


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| 62 | 18BT3078 | PYTHON AND R PROGRAMMING | CO1 | Understand the basics of Python and R programming |
| | | | CO2 | Analyze Biological sequence analysis with python |
| | | | CO3 | Analyze biological data statistics |
| | | | CO4 | Analyze gene expression with R |
| 63 | 18BT3079 | DATABASE MANAGEMENT SYSTEMS | CO 1 | Acquire knowledge on database systems |
| | | | CO 2 | Apply SQL in relational model |
| | | | CO 3 | Compare data storage devices |
| | | | CO 4 | Analyze current trends in data types |
| 64 | 18BT3081 | STEM CELL TECHNOLOGY | CO1 | Acquire the knowledge of stem cell technology |
| | | | CO2 | Understand stem cell characterization and tissue engineering |
| | | | CO3 | Illustrate various strategies involved in regulation and stem cell. |
| | | | CO4 | Apply various principles involved in stem cell therapies. |
| 65 | 18BT3082 | HEALTHCARE BIOTECHNOLOGY | CO1 | Acquire the knowledge of simple proteins and therapeutic agents |
| | | | CO2 | Acquire the knowledge of Human diseases |
| | | | CO3 | Describe the various vaccines used |
| | | | CO4 | Understand the applications of genetic engineering in healthcare |


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| 66 | 18BT3083 | CANCER BIOLOGY | CO 1 | Acquire the knowledge of cancer |
| | | | CO 2 | Understand about various agents in carcinogenesis |
| | | | CO 3 | Apply molecular biology in various cancer cells |
| | | | CO 4 | Apply the role of immune cells in Cancer |
| 67 | 18BT3084 | NEURO BIOLOGY | CO 1 | Understand the basic concepts of neuroscience |
| | | | CO 2 | Understand Neurotransmitters and Receptors |
| | | | CO 3 | Compare and contrast vestibular system |
| | | | CO 4 | Develop various strategies of nervous system and its Neuronal modulation |
| 68 | 18BT3085 | BIOELECTRONICS AND BIOSENSORS | CO 1 | Understand concepts of biosensors |
| | | | CO 2 | Compare transducers in biosensors |
| | | | CO 3 | Apply bioelectronics in imaging process |
| | | | CO 4 | Develop various strategies for design for biophotonic computer |
| 69 | 18BT3086 | TISSUE ENGINEERING | CO1 | Remember the knowledge of Tissue Engineering and Cell-Based Therapies |
| | | | CO2 | Recall the knowledge of Tissue culture basics |
| | | | CO3 | Understand 3D organization and angiogenesis |
| | | | CO4 | Apply the role of Stem Cells in treating tissue defects using case studies |


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| 70 | 18BT3087 | VIROLOGY | CO 1 | Acquire the knowledge of viruses |
| | | | CO 2 | Acquire the knowledge of techniques in virology |
| | | | CO 3 | Analyze structure of viruses |
| | | | CO 4 | Compare plant and animal viruses |
| 71 | 18BT3088 | NANOBIOTECHNOLOGY | CO 1 | Understand concepts of nanotechnology |
| | | | CO 2 | Compare biopolymer and Lipo polymer strategies |
| | | | CO 3 | Develop various strategies of nucleic acid based nonmaterial's |
| | | | CO 4 | Conclude various principles involved in Biocompatible material's |
| 72 | 18BT40A1 | IPR & PATENT LAWS | CO 1 | Acquire the knowledge of intellectual property rights |
| | | | CO 2 | Describe the principles and regulatory affairs |
| | | | CO 3 | Develop documentation ,Protocols and Case Studies on patents |
| | | | CO 4 | Compare various Case Studies on Patents |

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