Course Outcome for B.E. Biotechnology

Class	Semester	Name of the Subject	CO	COURSE OUTCOME
FE	I	Chemistry	824101.1	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.
			824101.2	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques
			824101.3	Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.
			824101.4	Rationalise bulk properties & processes using thermodynamic considerations
			824101.5	List major chemical reactions that are used in the synthesis of molecules.
FE	I	Engineering Graphics	824104.1	Introduction to engineering design and its place in society
			824104.2	Exposure to the visual aspects of engineering design
			824104.3	Exposure to engineering graphics standards
			824104.4	Exposure to solid modeling.
FE	I	English	824103.1	To acquire basic proficiency in English including reading and listening
			824103.2	To demonstrate proficiency in the use of written English, including proper spelling, Grammar and punctuation.
			824103.3	To enhance their ability to use spoken words in interpersonal communication, small group interactions and public speaking Comprehension, writing and speaking skills.
			824103.4	Become accomplished technical communicators.
FE	I	Mathematics - I	824102.1	Apply differential and integral calculus. Apart from some other applications they will have a basic understanding of Beta and Gamma functions.
			824102.2	The fallouts of Rolle’s Theorem that is fundamental to application of analysis to Engineering problems.
			824102.3	The tool of Fourier series for learning advanced Engineering Mathematics.
			824102.4	To deal with functions of several variables that are essential in most branches of Engineering.The essential tool of matrices and linear algebra in a comprehensive manner.

Class	Semester	Name of the Subject	CO	COURSE OUTCOME
FE	I	Chemistry Lab	824106.1	Upon successful completion of lab Course, student will be able to: The chemistry laboratory course will consist of experiments illustrating the principles of chemistry relevant to the study of science and engineering. The students will learn to:
			824106.2	Estimate rate constants of reactions from concentration of reactants/products as a function of time
			824106.3	Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc
			824106.4	Synthesize a small drug molecule and analyse a salt sample .
FE	I	Engineering Graphics Lab	824108.1	Introduction to engineering design and its place in society
			824108.2	Exposure to the visual aspects of engineering design
			824108.3	Exposure to engineering graphics standards
			824108.4	Exposure to solid modeling.
FE	I	English Lab	824107.1	Students will be sensitized towards recognition of English sound pattern.
			824107.2	The fluency in speech will be enhanced.
FE	I	Workshop Practices	824105.1	Students will be able to fabricatecomponents with their own hands.
			824105.2	Get practical knowledge of the dimensional accuracies and dimensional tolerances possible
			824105.3	with different manufacturing processes.
			824105.4	Assemble different components, they will be able to produce small devices oftheir interest.
FE	II	Physics	824201.1	To study Bragg’s Law and introduced to the principles of lasers, types of lasers and applications
			824201.2	Various terms related to properties of materials such as, permeability, polarization, etc.
			824201.3	Some of the basic laws related to quantum mechanics as well as magnetic and dielectric
			824201.4	properties of materials
			824201.5	Simple quantum mechanics calculations
			824201.6	Nanotechnology and their industrial applications.

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FE	II	Mathematics-II	824202.1	Use mathematical tools needed in evaluating multiple integrals and their usage.
			824202.2	Apply effective mathematical tools for the solutions of differential equations that model physical processes.
			824202.3	Use tools of differentiation and integration of functions of a complex variable that are used in various techniques dealing engineering problems.
FE	II	Basic Electrical & Electronics Engineering	824203.1	Students will be able to demonstrate knowledge of circuit analysis using various basic laws and theorems of electrical circuits
			824203.2	Students will be able to demonstrate and understand definition and relationship of various AC circuits.
			824203.3	Understand working principle of PN junction diode, Zener diode and their applications.
			824203.4	Describe different configuration of Bipolar Junction Transistor.
			824203.5	Describe different configurations of FET
			824203.6	Understand operating principle Power Electronics Devices
			824203.7	Describe use of the Basic gate and Universal gate
FE	II	Programming for Problem Solving	824204.1	To formulate simple algorithms for arithmetic and logical problems
			824204.2	Understand the fundamentals of C programming.
			824204.3	To test and execute the programs and correct syntax and logical errors
			824204.4	Choose the loops and decision making statements to solve the problem.
			824204.5	To decompose a problem into functions and synthesize a complete program using divide and conquer approach
			824204.6	To use arrays, pointers and structures to formulate algorithms and programs
FE	II	Physics Lab	824205.1	To study Bragg’s Law and introduced to the principles of lasers, types of lasers and applications
			824205.2	Various terms related to properties of materials such as, permeability, polarization, etc.
			824205.3	Some of the basic laws related to quantum mechanics as well as magnetic and dielectric
			824205.4	properties of materials

Class	Semester	Name of the Subject	CO	COURSE OUTCOME
			824205.5	Simple quantum mechanics calculations
			824205.6	Nanotechnology and their industrial applications.
FE	II	Basic Electrical and Electronics Engineering Lab.	824206.1	Identify electrical and electronics components/equipments.
			824206.2	Simplify D.C. network using Superposition Theorem.
			824206.3	Simplify D.C. network using Thevenin's Theorem.
			824206.4	Learn diode V-I Characteristic
			824206.5	Understand BJJ as a switch
			824206.6	Understand LED, JFET, SCR V-I characteristics
FE	II	Programming for Problem Solving Lab	824207.1	Understand the fundamentals of C programming.
			824207.2	Choose the loops and decision making statements to solve the problem.
			824207.3	Use functions to solve the given problem.
			824207.4	Implement different Operations on arrays.
			824207.5	Understand strings and structures.
			824207.6	Understand the usage of pointers.
SE	III	Microbiology	824304.1	Apply their knowledge in research related to the use of microbes for human welfare like food production, pigment production, pharmaceutical products etc.
			824304.2	format;
			824304.3	Analyze and simplify the complex issues in microbiology.
			824304.4	Interpret the mode of action of antibiotics and therapeutic agents.
			824304.5	Describe the concepts of microbial growth kinetics and continuous cultures.
SE	III	Biology	824301.1	Describe the concepts of modern cell theories and identify the differences in eukaryotic and prokaryotic cells.
			824301.2	Explain the major groups of animal and plant kingdom

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			824301.3	Demonstrate the advanced techniques in plant and animal tissue culturing, and able to calculate the growth rate of cells through culturing
			824301.4	Classify the microorganisms through different isolation techniques and illustrate microbial culture techniques
			824301.5	Illustrate mechanism involved in rDNA technology and apply the different aspects of Biotechnology
SE	III	Bioprocess Calculations	824302.1	Differentiate between different units and dimensions and solve relevant proble
			824302.2	Have the ability to identify, formulate and solve engineering problems
			824302.3	Have gained fundamental skills in solving material balance problems with and without bioreactions
			824302.4	Have gained fundamental skills in solving energy balance problems with and without bioreactions.
			824302.5	Understand humidity, humid heat, humid volume, dry-bulb temperature, wet-bulb temperature, psychometric chart & steam table
SE	III	Unit Operations	824303.1	Understand the following terms in relation to fluid mechanics: viscosity, density, specific gravity, and surface tension. Measure the properties listed above for any given fluids.
			824303.2	Apply their knowledge to minimize head losses and evaluate flow through a pipe system by using different types of flow meters.
			824303.3	Understand the principles of manometer to calculate pressure of the fluids
			824303.4	Understand the handling of solid and size reduction of solid
			824303.5	Identify the separation technique
SE	III	Bioprocess Industrial Economics & Management	824305.1	Apply the basic knowledge of economics in order to design the bioprocesses at low cost
			824305.2	Apply knowledge of marketability to communicate effectively about various bioprocesses of products.
			824305.3	Apply the knowledge to set up a bioprocess Industry in all respect

Class	Semester	Name of the Subject	CO	COURSE OUTCOME
			824305.4	Estimate the cost of final product
			824305.5	Calculate the profitability and losses during the product formation
SE	III	Unit Operations Lab	324306.1	Determine properties of Fluids and Solid .
			324306.2	Identify the problem and solve the problem .
			324306.3	Determine the coefficient of Venturi meter, Orifice meter.
			324306.4	Apply the knowledge to estimate minor losses in pipes.
			324306.5	Determine the friction factor for given pipe.
SE	III	Microbiology Lab		Use the microscope effectively and observe and identify the characteristics of microorganisms.
			324307.2	Stain the microbes for better visualization and characterization of cells and cell organelles
			324307.3	Identify and examine the microorganisms from the food sample and environment.
			324307.4	Enumerate the microbes by various methods including viable cell count, haemo-cytometer and turbidity measurement.
			324307.5	Prepare the media and cultivate the microorganisms by different methods.
SE	III	Good Manufacturing practises Lab	324308.1	Follow fundamental compliance requirements for current GMP.
			324308.2	Apply compliance protocols in all efforts aimed at generating regulated data for evaluation by the US FDA and regulatory agencies overseas.
			324308.3	Demonstrate their understanding good practices in production.
			324308.4	Demonstrate the packaging techniques of bioproducts
			324308.5	Explain the role and functions of various preservative components.
SE	IV	Process Heat Transfer	824402.1	Demonstrate general applications of heat transfer modes as conduction, convection and radiation in biochemical process industry.
			824402.2	Design a process , system and to conduct the experiments.
			824402.3	Demonstrate working and principle of all types of evaporators which are used in industries

Class	Semester	Name of the Subject	CO	COURSE OUTCOME
			824402.4	Know working and principles of all types of Heat Exchanger equipments which are widely used in biochemical, fermentation and pharmaceutical industries.
			824402.5	Design of heat exchange equipments.
SE	IV	Immunology	824403.1	Understand the basic principles of modern immunology and an introduction to methods used in immunological research
			824403.2	Describe the cells, molecules and pathways involved in the induction and regulation of innate and adaptive immune responses and how regulatory responses can be exploited therapeutically
			824403.3	Demonstrate an understanding of how vaccines work and of the requirements for developing new safe and effective injectibles and mucosal vaccines.
			824403.4	Integrate information on the role of the immune system in asthma and chronic obstructive pulmonary disease and the use of this information to develop new therapies for these conditions.
			824403.5	Explain the role of applied immunology parameters.
SE	IV	Biochemistry	824404.1	Identify the classes of biomolecules and their role in the biological system.
			824404.2	Explain the functions and properties of biomolecules
			824404.3	Explain the synthesis of biomolecules in biological system and how it directly relate the energy generation in body.
			824404.4	Separate biomolecules from the source by biochemical techniques and its application for human welfare
			824404.5	To demonstrate and explain concept of enzymes & membrane transport
				Average
SE	IV	Intellectual Property Rights & Entrepreneurship	824405.1	Choose which type of IPR they should apply for.
			824405.2	Adopt environment friendly approach industrially.
			824405.3	Understand entrepreneurial aspects.
			824405.4	Understand the basics of marketing management.

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			824405.5	Apply project Management Techniques to real life industrial problems
SE	IV	Biostatistics	424401.1	Will be able to use Probability distributions effectively. Also will be able to know a given set of data will follow which distribution.
			424401.2	Will be able to calculate the mean and variance of a probability distribution.
			424401.3	Can use sampling for performing any real experiment which is otherwise very expensive
			424401.4	Will be able to use t-test, F-test and chi square test etc. for Goodness of fit to test hypothesis.
			424401.5	Able to apply Randomization to avoid confounding the variable under investigation with other uncontrollable variables.
SE	IV	Process Heat Transfer Lab	424406.1	Demonstrate general applications and use of heat exchange equipments in industries.
			424406.2	Control the different parameters which are required for various processes industries.
			424406.3	Analyze and interpret the data of various processes.
			424406.4	Determine rate of heat transfer through various modes of heat transfer.
			424406.5	Design heat exchange equipment.
SE	IV	Immunology Lab	424407.1	Apply the basic fundamentals in antigen antibody reaction for designing the experiment.
			424407.2	Perform the analytical techniques in immunology in the industry.
			424407.3	Describe various types of antigen and antibody reactions at in vitro conditions.
			424407.4	Perform Immunoelectrophoresis.
			424407.5	Demonstrate the various immunodiffusion techniques.
SE	IV	Biochemistry Lab	424408.1	Estimate the amount of different biomolecules like carbohydrates, proteins, nucleic acids from various sources.
			424408.2	Understand the basic principle of isoelectric precipitation.

Class	Semester	Name of the Subject	CO	COURSE OUTCOME
			424408.3	Apply the basic properties of biomolecules for their separation from mixture.
			424408.4	Extract the lipids from various biological sources.
			424408.5	Understand the basic principles of thin layer chromatography and gel electrophoresis.
SE	IV	Lab Environmental Biotechnology	424409.1	Communicate their understanding of environmental science to a lay audience.
			424409.2	Demonstrate through presentation an understanding of the global character of environmental problems and ways of solving them, including collaborative efforts spanning local to global scale.
			424409.3	Use the techniques, skill and modern engineering tools necessary for engineering practice.
			424409.4	Apply the knowledge of engineering principles to living entities for societal welfare.
			424409.5	Work in multidisciplinary stream.
TE	V	Enzyme Engineering	824503.1	Classify enzymes on the basis of their working mechanism.
			824503.2	Calculate the enzyme kinetics and activity by performing various assays.
			824503.3	Characterize the enzymes by using modern equipments.
			824503.4	Immobilize enzyme by various immobilization techniques for better stability and activity as well as to reduce their losses during use.
			824503.5	Apply molecular mechanism of various enzymes in different metabolic pathways.
TE	V	Reaction Engineering	824502.1	Determine the rate and order of reaction from experimental data.
			824502.2	Analyze and interpret the kinetics of reactions.
			824502.3	Apply the fundamentals of chemical reaction engineering to design different types of reactors.
			824502.4	Explain heterogeneous system with its applications.
			824502.5	Use the various types of reactors for different types of homogeneous and heterogeneous reactions
TE	V	Molecular Biology	824501.1	Describe basic molecular and genetic concepts and principles.

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			824501.2	Communicate the fundamental concepts of molecular biology both in written and in oral format.
			824501.3	Demonstrate nucleic acid replication and its types.
			824501.4	Critically evaluate data, develop and design experiments to address a novel problem in the form of project.
			824501.5	Demonstrate advanced knowledge in a specialized field of molecular biology
TE	V	Professional Elective Course –I Food Biotechnology	824541.1	Find out the different microorganism responsible for food spoilage.
			824541.2	Distinguish different constituents of the food and their role in body.
			824541.3	Use their knowledge to preserve the food.
			824541.4	Apply their knowledge of unit operation in food industry.
			824541.5	Use the techniques, skill and modern engineering tools necessary for engineering practice.
TE	V	Open Elective Course – I Biofuel and Alcohol Technology	824551.1	Understand Biofuel and biomass production.
			824551.2	Critically appraise logistical issues associated with implementing large scale biofuel and biomass energy production.
			824551.3	Perform technical, economic and environmental comparisons of various energy systems.
			824551.4	Implement the various methods of fermentations processes.
			824551.5	Illustrate the alcohol recycling & biochemistry of alcohol.
TE	V	Lab Molecular Biology	524506.1	Isolate the genetic material e.g. DNA & RNA from different cells.
			524506.2	Calculate molecular weight by using DNA marker with agarose gel electrophoresis
			524506.3	Extract of chromosomal DNA from onion cells
			524506.4	Determine the melting temperature (Tm) and base composition of DNA from thermal denaturation characteristics.
			524506.5	Quantify Nucleic acids.

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TE	V	Lab Reaction Engineering	524507.1	Understand the kinetic study of various chemical and biochemical reactions used in process industries
			524507.2	To design various types of Reactors.
			524507.3	Demonstrate an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
			524507.4	Demonstrate the understanding of professional and ethical responsibilities.
			524507.5	Understand the environmental issues and to provide solutions for green and clean technologies
TE	V	Lab Pharmaceutical Biotechnology	524508.1	Isolate the microbes by air microbiology: solid and liquid impingement methods.
			524508.2	Apply the use coliform count of water by MPN technique.
			524508.3	Identify the sterility as per IP.
			524508.4	Explain the functions of selective media: McConkey Agar, Cetrimide Agar, Vogel Johnson, Salt mannitol agar.
			524508.5	Study various immunology and biochemical test.
TE	V	Minor Project (Stage–I)	524509.1	Demonstrate a sound technical knowledge of their selected project topic.
			524509.2	Undertake problem identification, formulation and solution.
			524509.3	Design engineering solutions to complex problems utilizing a systems approach.
			524509.4	Conduct an engineering project.
			524509.5	Demonstrate the knowledge, skills and attitudes of a professional engineer.
TE	VI	Genetic Engineering	824601.1	Apply the knowledge of rDNA technology for the construction of novel gene for the better use with wide functionality.
			824601.2	Use various vector systems to study functionality of inserted gene.
			824601.3	Demonstrate various techniques in gene sequencing.
			824601.4	Apply the knowledge of genetics for human welfare in disease diagnosis, in criminal cases as well as pharmaceuticals for drug designing and development.

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			824601.5	Explain mechanism of molecular markers that are used in genetic engineering study.
TE	VI	Mass Transfer	824602.1	Demonstrate the knowledge of various mass transfer operations and its application in process industries.
			824602.3	Explain & apply knowledge of different separation techniques in downstream processing.
			824602.2	Apply appropriate criteria for selection among alternative separation technologies.
			824602.4	Increase yield and purity of various products in process industries by applying knowledge.
			824602.5	Ability to analyze and design mass transfer equipments.
TE	VI	Professional Elective Course - II Plant Biotechnology	824641.1	Understand the bioethical issues related to plant Biotechnology.
			824641.2	Apply the advanced techniques in plant tissue culturing for making the modified varieties of plants.
			824641.3	Develop the disease and pest resistant plants.
			824641.4	Produce the value added products which are having commercial value by applying the protocols of fermentation technology.
			824641.5	Explore the options for plant biotechnology in higher study.
TE	VI	Open Elective Course - II Bioprocess Instrumentation and Analysis	824654.1	Get familiar with various standards and calibration methods used in Instrumentation and Instrumental Analysis.
			824654.2	Get knowledge of basic principles behind the working of different analytical instruments and its application in industries.
			824654.3	Use suitable measurement technique for process industries.
			824654.4	Control system for monitoring of various parameters in bioprocess industries and to maintain safety.
			824654.5	Get insights of flame photometry and microscopy.

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TE	VI	Bioprocess Engineering	824603.1	Apply knowledge of chemical and mechanical engineering for design of biological system in biotech industries.
			824603.2	Design and conduct experiments on different bioreactors and to analyze and interpret data for optimization of process.
			824603.3	Design various bioprocess equipment to meet desired needs of mankind within realistic constrain like social, ethical, health and safety.
			824603.4	Get the knowledge of properties of materials and its view in designing bioprocess equipment within the standards prescribed by regulating authority in India and world.
			824603.5	Integrate knowledge of bioscience, biochemical engineering, in commercial context to solve a substantial range of bio- processing and biological engineering problems and issues for production of value added products for societal development.
TE	VI	Lab Genetic Engineering	624606.1	Use restriction digestion enzyme for various applications of DNA study
			624606.2	Use ligation enzyme to join different DNA to form new product
			624606.3	Prepare plasmid for various applications
			624606.4	Use DNA fingerprinting method by RFLP for various applications.
			624606.5	Map the genomic DNA
TE	VI	Lab Mass Transfer	624607.1	Recognize types of diffusion and the mechanism of diffusion.
			624607.2	Demonstrate an ability to solve the mass transfer problems by calculating the Mass Transfer Coefficient.
			624607.3	Use practical considerations for designing and operation of mass transfer operations / equipments.
			624607.4	Identify, formulate, design and provide the solution to various chemical engineering problems.
			624607.5	Understand the environmental issues and to provide solutions for green and clean technologies
TE	VI	Lab Bioprocess Engineering	624608.1	Understand the basic design of the fermenter.

Class	Semester	Name of the Subject	CO	COURSE OUTCOME
			624608.2	Apply the knowledge to study kinetics of the process.
			624608.3	Apply the knowledge of sensors and various sterilization techniques involved in the process.
			624608.4	Perform various fermentation processes
			624608.5	Perform immobilization of various bioproducts
TE	VI	Minor Project	624609.1	Demonstrate a sound technical knowledge of their selected project topic.
			624609.2	Undertake problem identification, formulation and solution.
			624609.3	Design engineering solutions to complex problems utilizing a systems approach
			624609.4	Conduct an engineering project
			624609.5	Demonstrate the knowledge, skills and attitudes of a professional engineer.
BE	VII	Bioinformatics	724701.1	To understand the theoretical basis behind bioinformatics.
			724701.2	Search databases accessible on the WWW for literature relating to molecular biology and biotechnology.
			724701.3	Manipulate DNA and protein sequences using stand-alone PC programs and programs available on the WWW. Find homologues, analyze sequences, construct and interpret evolutionary trees.
			724701.4	View and interpret these biomelecules structures.
			724701.5	Understand homology modeling and computational drug design.
BE	VII	Professional Elective Course - III Crop Improvement	724721.1	Students would be able to do transformation of crop plants to increase crop productivity.
			724721.2	Apply molecular markers for MAS in breeding.
			724721.3	Explain and demonstrate the different molecular markers.
			724721.4	Describe the metabolic systems in plants.
			724721.5	Study the Biochemistry involved in plant cells.

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BE	VII	Professional Elective Course - IV Analytical Methods in Biotechnology	724731.1	Interpret electromagnetic spectrums.
			724731.2	Handle various spectroscopic techniques.
			724731.3	Perform various elctroanalytical methods.
			724731.4	Handle various types of microscopes.
			724731.5	Determine structures of biomolecules
BE	VII	Open Elective Course - III Bioprocess Optimization and Plant Design	724741.1	Optimize various bioprocesses
			724741.2	Conduct technical feasibility survey
			724741.3	Utilize Statistical and Non statistical approach for Bioprocess optimization
			724741.4	Apply various optimization techniques in the design of fermenter.
			724741.5	Evaluate of heat load for any fermentation process
BE	VII	Lab Bioinformatics	724705.1	Apply practical knowledge for information retrieval.
			724705.2	Apply the basic knowledge for developing and using tools for sequence analysis of biomolecules.
			724705.3	Apply the basic knowledge for developing and using tools for structure analysis of biomolecules.
			724705.4	Carry out sequence alignment and analysis.
			724705.5	Explore the options for Bioinformatics in higher study
BE	VII	Lab Plant Tissue Culture	724706.1	Apply the basics of the lab design
			724706.2	Utilize various sterilization techniques
			724706.3	Apply the knowledge of various PTC techniques
			724706.4	Produce the synthetic seeds

Class	Semester	Name of the Subject	CO	COURSE OUTCOME
			724706.5	Understand the genetic engineering approaches related to the course
BE	VII	Project (Stage - I)	724707.1	Demonstrate a sound technical knowledge of their selected project topic.
			724707.2	Undertake problem identification, formulation and solution.
			724707.3	Design engineering solutions to complex problems utilizing a systems approach.
			724707.4	Conduct an engineering project
			724707.5	Demonstrate the knowledge, skills and attitudes of a professional engineer.
BE	VIII	Bioprocess Industries	824801.1	Apply knowledge of chemical and mechanical engineering for design of biological system in biotech industries.
			824801.2	Get the knowledge of properties of materials and its view in designing bioprocess equipment within the standards prescribed by regulating authority in India and world.
			824801.3	Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.
			824801.4	Work in an industrial or research position within the bioprocess or related fields.
			824801.5	Demonstrate the technology behind Biotransformation
BE	VIII	Professional Elective Course - V Molecular Biology of Cancer	824821.1	Understand the types of cancer.
			824821.2	Understand the metabolism of carcinogenesis.
			824821.3	Study the about the different types of Oncogenes.
			824821.4	Understand various techniques for detection of cancer.
			824821.5	Apply the knowledge of various types of cancer therapy.
BE	VIII	Professional Elective Course - VI Industrial Biotechnology	824833.1	Get familiarize with various enzymes used in industry.
			824833.2	Gain the knowledge regarding Primary and Secondary metabolites.

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			824833.3	Apply their knowledge to effectively manage hazardous waste.
			824833.4	Apply various strategies of bioremediation.
			824833.5	Adopt eco friendly approaches and renewable energy alternatives to minimize the pollution.
BE	VIII	Open Elective Course - IV Agricultural Biotechnology	824843.1	Formulate various types of medias required in plant tissue culture.
			824843.2	Breed various crop varieties.
			824843.3	Develop transgenic varieties of crops.
			824843.4	Performs tissue culturing of various plants.
			824843.5	Apply Advanced technologies available for crop improvement
BE	VIII	Lab Downstream Processing	824806.1	Isolate the biomolecules/bioproducts from the fermentation broths.
			824806.2	Recover the intracellular products from the microbial cells by applying the cell disruption techniques.
			824806.3	Precipitate the soluble bioproducts from the fermentation broths such as proteins and enzymes.
			824806.4	Identify the recovered product quantitatively and qualitatively by applying the analytical techniques on them.
			824806.5	Study and estimate the concentration of the recover bioproducts.
BE	VIII	Lab Bioprocess Industries	824805.1	Demonstrate a detailed knowledge of growth kinetics.
			824805.2	Study the effect of substrate and product concentration on biomass yield for baker‘s yeast production Interpret the significance of Biotechnology in production.
			824805.3	Demonstrate a detailed knowledge of therapeutic agents of microbial origin and their production.
			824805.4	Demonstrate knowledge of plant tissue culture systems and artificial seed production.
			824805.5	Produce single cell protein by fermentation.

Class	Semester	Name of the Subject	CO	COURSE OUTCOME
BE	VIII	Project (Stage-II)	824807.1	Demonstrate a sound technical knowledge of their selected project topic.
			824807.2	Undertake problem identification, formulation and solution.
			824807.3	Design engineering solutions to complex problems utilizing a systems approach.
			824807.4	Conduct an engineering project
			824807.5	Demonstrate the knowledge, skills and attitudes of a professional engineer