PRIST
DEEMED TO BE
UNIVERSITY
NAAC ACCREDITED
THANJAVUR – 613 403 - TAMILNADU

SCHOOL OF ARTS AND SCIENCE

DEPARTMENT OF BIOTECHNOLOGY

B.Sc. BIOTECHNOLOGY

CURRICULUM

REGULATION-2017

Head of the Department
Department of Biotechnology
School of Arts & Science
Prist Deemed to be University, Thanjavur

Dean of Arts & Science
PRIST Deemed to be University
Thanjavur - 613 403, Tamilnadu.

B.Sc., Graduate Attributes

Research, inquiry and analytical thinking abilities.

Capability and motivation for intellectual development.

Ethical, social and professional understanding.

Communication in intra and inter disciplinary

Teamwork, collaborative and management skills in scientific research

Information literacy in respective discipline

B.Sc., Program Educational Objectives PEO

PEO 1 : To obtain detailed information about the fundamentals of Biotechnology, allied subjects and life skills.

PEO 2 : To provide information about the molecular methods which involved in cellular processes of living systems such as microbes to higher order organisms for applied aspects. To address the emerging need for skilled scientific manpower with research ethics involving organisms.

PEO 3 : To impart the basics and current molecular tools in the areas of Molecular Diagnostics, Fermentation Technology, Plant, Animal & Environmental Biotechnology are included to train the students for man power development and also sensitize them to scope for research. The practical subjects will provide information about the careers in the industry and applied research where biological system is employed.

PEO 4 : To make the graduates of Biotechnology to learn and to adopt in a competitive world of technology update and contribute to all forms of life

PEO5- To enable them to excute a research objective through experimentation

B.Sc., Programme Specific Outcome (PSO)

PSO1- Graduates will exhibit contemporary knowledge in Biotechnology and students will be eligible for doing jobs in pharmaceutical and biotechnological Industry.

PSO2-An expert in biotechnology and allied fields (medical, microbial, agricultural, environmental, plant and animal) for utilizing the practical skill to address biotechnological challenges.

PSO3- Graduates will be able to work individually as well as in team to survive in multidisciplinary environment.

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PSO4- If students will engage themselves in the process of effective learning, it will give opportunities to utilize acquired knowledge for the catering the needs of science and technology as well as for the betterment of human mankind.

PSO5-Graduates will be able to understand the potentials, and impact of biotechnological innovations on environment and their implementation for finding sustainable solution to issues pertaining to environment, health sector, agriculture, etc.

B.Sc., Program Outcome PO

PO1-Understand the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life

PO2-Understanding and better knowledge of the causes, types and control methods for environmental pollution by the students.

PO3-The student will be able to discuss the mechanisms associated with gene expression system in prokaryotes and eukaryotes.

PO4-Developed various communication skills such as reading, listening, speaking etc.,

PO5-Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments

PO6-Ethics: Convey and practice social, environmental and biological ethics.

PO7-To get knowledge about research tools and learn to do review literature. Ability to carryout independent literature survey corresponding to the specific publications type and asses basic research tool

B.Sc., Biotechnology (C)

C1- Fundamentals of Biological System

C2- Fundamentals of Biological System Lab

C3- Biological Chemistry

C4- Biological Chemistry Lab

C5-Cell Biology and Genetics

C6- Cell Biology and Genetics Lab

C7- Microbiology

C8- Microbiology Lab

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C9- Research LED Seminar

C10-Plant Physiology

C11-Plant Physiology Lab

C12- Immunology

C13- Immunology Lab

C14- Research Methodology

C15- Animal Physiology

C16- Animal Physiology Lab

C17- Bioinformatics and Biostatistics

C18- Bioinformatics and Biostatistics Lab

C19- Development Biology

C20- Cell and Tissue Culture

C21- Enzyme and Enzyme Technology

C22- Development Biology, Tissue Culture Lab

C23- Enzyme and Enzyme Technology Lab

C24-Discipline Specific Elective

C25- Plant and animal Biotechnology

C26- Applied Biotechnology

C27- Plant, Animal and Applied Biotechnology Lab

C28- Environmental Biotechnology Lab

C29- Discipline Specific Elective

C30-Package lab- I-VI

C31- Communicative English LabI-VI

B.sc., Curriculum Mapping

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Programme Educational objectives Vs Programme Outcome

Programme Outcome PO Programme specific outcome PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
PSO1	*	*		*	*	*	*
PSO2			*		*	*	*
PSO3	*	*	*		*		
PSO4	*	*	*			*	*
PSO5	*		*	*	*		*

B.Sc Biotechnology Curriculum Mapping

Programme Outcome Vs Course Outcome

Programme Outcome- PO Courses Outcome- CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	*	*	*	*	*	*	*
CO2	*	*	*	*	*	*	*
CO3	*	*	*	*	*	*	*
CO4	*	*	*	*	*	*	*
CO5	*	*	*	*	*	*	*
CO6	*	*	*	*	*	*	*
CO7				*	*	*	*
CO8	*	*	*	*	*	*	*

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CO9				*	*	*	*
CO10	*	*	*	*	*	*	*
CO11			*	*	*	*	*
CO12	*	*	*	*	*	*	*
CO13	*	*	*	*	*	*	*
CO14	*	*	*	*	*	*	*
CO15	*	*	*	*	*	*	*
CO16	*	*	*	*	*	*	*
CO17	*	*	*	*	*	*	*
CO18	*	*	*	*	*	*	*
CO19	*	*	*	*	*	*	*
CO20				*	*	*	*
CO21	*	*	*	*	*	*	*
CO22				*	*	*	*
CO23	*	*	*	*	*	*	*
CO24			*	*	*	*	*
CO25	*	*	*	*	*	*	*
CO26	*	*	*	*	*	*	*
CO27	*	*	*	*	*	*	*
CO28	*	*	*	*	*	*	*
CO29	*	*	*	*	*	*	*
CO30	*	*	*	*	*	*	*
CO31	*	*	*	*	*	*	*

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School of Arts and Science
Department of Biotechnology
17UGBTGEC
2017 Regulation
Program Outcomes and Course outcomes of
B.Sc., Mapping of COs and Pos

Semester	Course Code	Title of the Course	Cos	POS						
				PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7
I	17110AEC11	Language-I (Tamil-I)	Learn the changes that have occurred in literature since the classical period.	1	2	1	0	1	2	1
			Make use of vocabulary systematically.	1	2	1	1	1	2	0
			Understand how to lead one's life realizing the modernity and its environment/atmosphere.	1	2	1	0	1	2	1
I	17111AEC11	Advanced English-I	Develop vocabulary	1	2	0	1	1	2	2
			Learn to edit and do proof reading	1	2	1	1	0	2	1
			Read and comprehend literature	1	2	0	0	1	0	0
I	17111AEC12	English-I	Read and comprehend literature	1	2	1	1	0	2	2
			Appreciate poetry and prose	1	2	0	1	1	0	0

			Familiarize students with fiction.	1	3	1	1	1	2	1
I	17117AEC13	Fundamentals of Biological system	Understand the physical, chemical, and mathematical basis of biology	3	1	1	0	0	0	2
			Appreciate the different scales of biological systems	2	0	0	2	0	2	0
			To understand the Basics in life sciences, evolution and organization of life, living and non-living things	2	1	3	0	3	0	3
			To understand the basics of biomolecules, carbohydrates, proteins, lipids and Nucleic acids	3	1	0	2	3	0	2
I	17117AEC14L	Fundamentals of Biological system Lab	The learners will acquire knowledge on the structure and functions relationship of biological system and as well their roll in various biological process	2	1	1	1	3	2	3
			To know the cellular organization of life, cell theory- cell organization-cell organelles- plant and animal cell	2	0	1	1	0	1	2
			To understanding the basic fundamentals of Biological System	2	1	1	1	1	1	3
I	117115AEC15	Biological Chemistry	The learners will acquire knowledge on the structure and functions relationship of proteins nucleic acid carbohydrates and as well their roll in various biological process	2	0	1	1	1	2	3
			They study the influence and role of structure in reactivity of biomolecules	3	1	1	1	1	0	3
			Through this course the students are exposed to importance of biological macromolecules	2	0	1	1	1	0	3

I	17115AEC16L	Biological Chemistry Lab	Students will use current biochemical and molecular techniques to plan and carry out experiments.	2	1	2	1	1	0	3
			Biochemistry Majors will gain proficiency in basic laboratory techniques in both chemistry and biology, and be able to apply the scientific method to the processes of experimentation and hypothesis testing	3	0	1	0	1	0	3
			At the end of the course, the students have a thorough understanding on the role of biomolecules and their functions	0	1	2	1	1	3	3
I	17120SEC01A	Skill Based Elective-I	Recognize when to use each of the Microsoft Office programs to create professional and academic documents.	0	0	1	0	0	2	3
			Use Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards.	2	1	2	1	1	0	3
			Apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.	2	2	0	0	1	2	3
I	17111SEC01L	Communicative English Lab-I	Learn grammar.	2	2	1	0	1	2	3
			Enrich vocabulary	2	3	1	1	2	2	3
			Understand the process of communication	2	2	1	1	0	2	2
			Develop listening skill	2	2	0	0	0	0	0
I	171INDCONS	Indian Constitution	Democratic values and citizenship Training and gained	2	3	0	0	1	0	0
			Awareness on fundamental Rights are established	2	2	1	0	1	1	0
			The functions of union Government and State Government are learnt	2	1	1	1	0	2	1

			The Power and functions of the Judiciary learnt thoroughly	2	0	1	1	1	1	1
			Appreciation of Democratic Parliamentary Rule is learnt	2	0	0	3	1	1	1
	17110AEC21	Language-II (Tamil-II)	Know what devotion really is.	2	1	2	2	1	1	1
			Know the fruitfulness obtained through devotion	1	1	2	2	1	2	1
II			Perceive the progress achieved in the society through devotion.	1	2	0	1	2	2	1
	17111AEC21	Advanced English-II	Develop technological skills.	1	2	1	0	2	2	0
			Able to write in a variety of formats	2	2	1	1	0	2	2
II			Read biographies and develop personality	1	2	0	1	1	2	2
	17111AEC22	English-II	Appreciate different forms of literature	0	2	0	1	0	2	0
			Acquire language skills through literature	2	2	1	1	1	2	1
II			Broadens the horizon of knowledge	1	2	1	1	0	2	1
	17117AEC23	Cell Biology and Genetics	This paper will enable the students to learn the basics and lay strong foundation in understanding the composition of cells, how cells works is fundamental to living systems.	1	2	0	0	2	2	0
			The course outcome is to train the students in understanding genetics and relate modern DNA technology for disease diagnostics and therapy	1	2	0	0	0	2	0
			Students will be taught Mendelian genetics, their principles and gene interaction.	3	0	0	0	2	2	1
II			This gives them a strong foundation on the basic unit of life.	3	0	1	1	2	2	0

II	17117AEC24L	Cell Biology and Genetics lab	Able to isolate the DNA, identify and distinguish different blood cells, to solve simple genetic problems and analyze Human karyotype	3	1	1	1	1	1	1
			The course teaches the students about genes at molecular level	2	1	0	1	1	0	1
			They learn about DNA, RNA and their replication, mutations, DNA repair mechanism	0	1	1	1	2	1	1
II	17116AEC25	Microbiology	This fundamental paper discusses the importance of microorganisms	3	1	1	1	1	3	1
			The course throws light on types of microorganisms in and around humans	2	0	0	1	2	2	1
			At the end of the course, the student has understanding on the metabolism and mechanism of microbial life	3	0	1	0	0	2	1
			Gain knowledge about metabolism.	2	0	0	1	1	1	1
II	17116AEC26L	Microbiology lab	Develop basic skill in aseptic techniques	2	1	1	0	1	2	1
			Understand various accessories for microbiology practicals	3	1	1	1	1	2	1
			Perform various staining techniques	2	1	1	1	1	1	1
			Cultivate bacteria with different cultivation technique	2	0	1	1	1	2	2
II	17117RLC27	Research LED Seminar	Exposure to various research domains	2	0	1	0	1	2	2
			Acquaintance with languages of research	3	0	1	1	0	0	2
			Development of research aptitude	3	1	1	1	1	1	1

II	17120SEC02A	Skill Based Elective – II	Identify the names and functions of the PowerPoint interface.	3	1	0	0	0	2	2
			Create, edit, save, and print presentations.	2	2	0	1	2	2	2
			Format presentations.	2	2	0	0	2	2	3
			Add a graphic to a presentation.	2	2	0	0	1	2	3
			Create and manipulate a simple slideshow with outlines and notes.	2	2	0	0	1	2	3
			Create slide presentations that include text, graphics, animation, and transitions.	3	3	0	0	1	2	2
II	17111SEC02L	Communicative English Lab-II	Learn grammar.	3	3	1	1	2	2	3
			Use a variety of reading strategies	1	1	0	2	2	2	2
			Enhance the skill of making grammatically correct sentences.	0	0	0	0	0	2	0
III	17110AEC31	Language-III (Tamil-III)	Achieve one's goal by following the ancestral path	1	2	0	1	2	2	1
			Learn to lead life of perfection by realizing the uncertainty in the life	1	2	1	0	1	2	1
			Attain happiness through honesty	1	2	0	1	2	2	2
III	17111AEC31	Advanced English-III	Understand phonetics.	1	2	1	0	1	2	2
			Develop writing skill	2	2	0	2	2	2	1
			Able to develop creative writing	0	0	0	0	0	0	0
III	17111AEC32	English-III	Enable to appreciate different types of prose	2	2	1	1	1	2	2

			Develop the conversational skills through one-act plays	1	2	0	1	1	2	1
			Enhance the skill of making grammatically correct sentences.	0	3	0	0	0	2	0
III	17117AEC33	Plant Physiology	Impart an insight into the various plant water relations	1	3	0	0	0	2	0
			Learning about the mineral nutrition in plants	3	0	1	1	1	2	2
			Understand the mechanism of various metabolic processes in plants	2	0	1	1	1	3	2
			Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.	2	1	1	1	1	3	2
III	17117AEC34L	Plant physiology Lab	Equip students with skills and techniques related to plant physiology so that they can design their own experiments	3	0	1	1	1	2	2
			Learn about the movement of sap and absorption of water in plant body.	3	1	0	0	1	1	3
			Understand the plant movements	2	1	1	0	1	1	2
III	17117AEC35	Immunology	The students may understanding the immune system, its components and various techniques used in bio manipulation.	2	0	1	1	1	1	2
			This course gives an overview on the immune system including organs, cells and receptors	2	2	1	1	1	2	2
			The students learns about molecular basis of antigen recognition, hypersensitivity reaction, antigen-antibody reactions	2	2	1	0	1	2	2

			The course develops in the student an appreciation for principles of immunology and its applications in treating human diseases	2	2	0	0	1	2	2
III	17117AEC36L	Immunology Lab	Identify the structure, function, and characteristics of immunoglobulins.	2	2	0	1	1	1	2
			Explain the principles of and perform serological tests.	2	1	1	1	1	1	1
			It's a paper which accomplishes the learning of techniques involved in understanding the immunological aspects of physiology and biological samples	1	1	0	0	1	1	1
III	17117RMC37	Research Methodology	Understanding research questions and tools	3	2	1	0	1	3	1
			Experience in scientific writings	3	2	2	1		3	1
			Practice in various aspects of scientific publications	3	2	1	1	1	3	3
			Inculcation of research ethics	3	2	0	1	1	2	2
III	17120SEC03A	Skill based Elective-III	Indicate the names and functions of the Excel interface components.	1	3	1	1	2	2	3
			Enter and edit data.	2	3	0	0	1	2	3
			Format data and cells.	2	3	0	0	2	2	1
			Construct formulas, including the use of built-in functions, and relative and absolute references.	2	3	1	0	1	2	2
			Create and modify charts.	2	2	0	0	2	2	2
			Preview and print worksheets	2	2	0	0	1	2	1
III	17111SEC03L	Communicative	Learn grammar.	2	2	0	1	1	2	0

		English Lab-III	Enhance their fluency in English	2	2	1	0	1	2	0
			Develop speaking and writing skills	2	2	0	1	0	2	0
			Develop individual perspectives that demonstrate critical thinking skills	0	2	0	0	1	1	0
IV	17110AEC41	Language-IV (Tamil-IV)	Realize how the ancient people changed their lifestyle according to the ages	2	3	1	0	1	1	1
			Learn how to change one's lifestyle according to the needs of the future	2	3	0	0	1	1	2
			Accept the modern trends and its uses	2	3	1	0	1	1	1
IV	17111AEC41	Advanced English-IV	Develop writing skill.	2	3	0	0	2	2	1
			Comprehend and describe poems	2	0	1	0	2	2	1
			Learn interviewing skills	0	3	0	0	0	2	0
IV	17111AEC42	English-IV	Improve their ability to read and understand them	2	2	0	1	1	2	1
			Know the genius of Shakespeare	0	2	0	0	0	2	0
			Express in writing their views.	2	2	0	0	1	2	0
IV	17117AEC43	Animal physiology	To provide advanced undergraduate and introductory graduate students with a comprehensive overview of animal physiology from molecular, cellular and whole animal systems approaches.	3	1	1	1	1	2	1
			To critically evaluate clinical and research case problems relating to endocrinology and cell biology.	3	1	0	1	1	2	2

IV	17117AEC44L	Animal Physiology Lab	Have an enhanced knowledge and appreciation of mammalian physiology	2	1	1	1	0	2	2
			Understand the functions of important physiological systems including the cardiorespiratory, renal, reproductive and metabolic systems	3	0	1	1	0	2	2
			It trains the students with essentiality of molecules, cells, tissues and organs involved in the defense mechanism	2	1	1	0	1	2	3
IV	17117AEC45	Bioinformatics and biostatistics	Know the applications and limitations of different bioinformatics and statistical methods.	2	1	1	0	1	2	3
			Be able to perform and interpret bioinformatics and statistical analyses with real molecular biology data.	1	0	0	0	0	2	1
			Be able to describe statistical methods and probability distributions relevant for molecular biology data.	3	1	1	0	1	2	1
IV	17116AEC46L	Bioinformatics and Biostatistics Lab	This laboratory course will prepare the students for various applications of bioinformatics in life science research.	3	2	1	1	1	2	2
			The student will be able to apply basic principles of biology, computer science and mathematics to address complex biological problems	3	1	1	1	1	2	2
			This course imparts the knowledge of basic statistical methods to solve problems	2	1	1	2	0	1	3
IV	17120SEC04A	Skill based Elective-IV	Examine database concepts and explore the Microsoft Office Access environment.	3	1	0	2	0	1	3
			Design a simple database.	1	2	0	2	1	1	3

			Build a new database with related tables.	2	3	0	0	2	2	3
			Manage the data in a table.	2	3	0	1	0	2	2
			Query a database using different methods.	2	3	0	0	2	2	2
			Design a form.	2	3	0	0	0	2	2
			Generate a report.	2	2	2	0	2	2	3
			Import and export data.	2	2	0	0	0	2	3
IV	17111SEC04L	Communicative English Lab-IV	Learn grammar.	2	2	1	1	2	2	3
			Enable to express their views in conversation	2	3	0	1	0	2	1
			Develop soft skills	1	2	0	1	1	2	1
			Enhance presentation skills	1	2	0	0	2	2	1
IV	171ENVTSTU	Environmental Studies	Understand ecosystem	1	2	1	0	2	2	1
			Know social issues and the environment	2	3	0	0	1	2	0
			Learn keep the environment eco-friendly	3	1	1	0	2	1	2
V	17117AEC51	Developmental Biology	Be able to list the types of characteristics that make an organism ideal for the study of developmental biology	2	1	2	1	2	1	2
			Be familiar with the events that lead up to and comprise the process of fertilization.	2	1	2	1	2	2	2

			Be able to compare and contrast the process of gastrulation in the various model organisms discussed	2	0	1	0	1	1	2
V	17117AEC52	Cell and Tissue culture	Fundamentals of plant tissue culture. Plant regeneration and organogenesis. Embryogenesis. Organ, anther and pollen culture. Ovary, ovule and embryo culture. Callus suspension culture.	3	1	1	0	1	2	3
			Protoplast, isolation, culture and fusion.	2	1	0	1	2	2	3
			Production of hybrids and cybrids.	2	1	1	0	1	1	
V	17117AEC53	Enzyme and enzyme technology	The course will provide an overview of the key enzymes currently used in large scale industrial processes	3	3	1	0	1	3	2
			This course includes the isolation, purification and characterization of enzymes and their applications	3	2	1	3	1	3	3
			Discover the current and future trends of applying enzyme technology for the commercialization purpose of biotechnological products.	3	2	1	2	1	3	3
V	17117AEC54L	Developmental biology, tissue culture lab	Demonstrate a basic understanding of developmental terms and mechanisms.	2	1	0	0	3	1	2
			Utilize laboratory techniques to design and carry-out experimental studies.	2	1	0	0	3	1	1
			Conservation of endangered plant species	3	1	0	0	3	2	2
			Molecular, pharmacological and biochemical investigations of different aspects of plant growth and development such as in vitro flowering.	3	0	1	0	1	2	3

V	17117AEC55L	Enzyme and Enzyme Technology Lab	Distinguish the fundamentals of enzyme properties, nomenclatures, characteristics and mechanisms	2	0	1	1	1	2	2
			Apply biochemical calculation for enzyme kinetics	2	0	1	1	1	1	3
			Compare methods for production, purification, characterization and immobilization of enzymes	2	1	1	1	1	1	2
			Discuss various application of enzymes that can benefit human life	2	1	2	0	1	1	2
V	17117DSC56A	Discipline Specific Elective -I rDNA Technology	Utilize the knowledge on creation of a genomic library	2	1	2	1	2	1	2
			Explain the significance of model organisms in recombinant DNA technology	3	1	1	1	2	2	3
			This course teaches rDNA technology techniques and their application in the field of genetic engineering They learn about plasmids, vectors and gain knowledge on the construction of cDNA libraries	2	0	1	1	3	2	3
V	17117DSC56B	Molecular Biology	Understand and apply the principles and techniques of molecular biology which prepares students for further education and/or employment in teaching, basic research, or the health professions	2	0	0	1	0	0	2
			Explain the concept of recombination, linkage mapping and elucidate the gene transfer mechanisms in prokaryotes and eukaryotes	3	2	1	1	1	1	2
			Know the terms and terminologies related to molecular biology and microbial	2	2	1	0	1	1	2

V	17117BRC57	Participation in Bounded Research	Hands on exposure to problem solving tools in contemporary research	1	2	1	0	1	1	2
			Evolution of research intuitiveness and orientation	3	1	1	1	1	1	3
			Familiarity with cutting edge research trends	2	2	1	1	1	1	2
V	17120SEC05A	Skill based Elective-V	Work with the Photoshop workspace	2	0	0	1	1	1	2
			Navigate images	3	0	0	0	1	1	3
			Resize and crop images	3	0	1	0	1	2	2
			Make and work with selections	2	2	1	1	1	2	1
			Create new layers and perform other basic layer functions	2	2	1	0	1	2	1
			Transform images	2	3	1	1	1	2	2
V	17111SEC05L	Communicative English Lab-V	Develop corporate skills.	2	3	0	0	0	2	2
			Handle their day to day affairs well with their knowledge of language skills.	2	2	0	0	0	2	1
			Get a Job.	2	2	1	0	2	2	2
VI	17117AEC61	Plant and Animal Biotechnology	This course teaches organization and expression of plant and animal genome and plant and animal tissue culture	2	2	0	1	0	2	2
			Students learn about transgenic animal, their application in pharmaceutical industry, cloning and its importance.	2	3	0	0	0	2	1

			This course prepares the students in appreciating the its benefits and applications in biotechnological, pharmaceutical, medical and agricultural field	2	3	0	1	1	1	1
VI	17117SEC62	Applied Biotechnology	Evaluate and describe systems of product research, development, and production	1	2	0	1	2	1	2
			Analyze the potential for commercialization for innovations within the biotechnology industry	2	2	0	0	1	2	2
			The students will gain the basic knowledge of aquaculture and Students will solve a variety of problems using creative thinking skills and analytical skills in the lab.	3	0	1	0	1	2	3
VI	17117SEC63L	Plant, Animal and Applied Biotechnology Lab	The students should have knowlwdge on biotechnological analysis and the utilization of these knowledge about procedures and utilization of such knowledge to combine biotechnological methods to obtain analytical results	2	0	1	1	1	2	3
			The students will develop fundamental knowledge in Plant Molecular Biotechnology and its application in laboratory and industry settings.	2	0	1	2	1	2	2
			Describe mechanisms of plant pollination and differentiate between haploid and diploid cells and their role in sexual reproduction	2	1	0	2	1	3	2
VI	17117AEC64L	Environmental Biotechnology Lab	To present an overview of important environmental biotechnologies involved in treatment of pollutants and resource recovery	3	1	1	1	1	2	1
			The students will be able to demonstrate the use of environmental science principle in solving various environmental problems	2	1	1	1	1	2	1

			Describe the most commonly applied disinfection methods, and the steps typically involved in drinking water treatment process	2	0	1	1	1	2	1
VI	17117DSC65A	Discipline Specific Elective - II Environmental Biotechnology	Biofuels: Advantages , Energy from biomass, Biogas, Biohydrogen, Biosafety • Toxicity Bio magnification, Threshold Dose, Factor Affecting Toxicity.	3	0	0	1	1	1	1
			Students will gain about environmental pollutions, preventive measures.	1	1	0	0	1	2	3
			Explain the microbial processes and growth requirements undelaying the activated sludge process, nitrification, denitrification, enhanced phosphorus removal, and anaerobic digestion	2	1	1	0	1	2	3
VI	17117DSC65B	Environmental Management	The students in the course are exposed to the diversity, function, ecological adaptation of microorganisms within the environment	1	2	1	2	1	1	2
			This course gives the importance of microbial life to key ecosystem process and teaches the role of biotechnology to address environmental issues	1	2	1	2	1	1	2
VI	17117PRW67	Project Work	Understand basic concepts of research and its methodologies	1	1	0	1	1	1	2
			Identify appropriate research problem and parameters	2	1	0	0	1	1	3
			Prepare a research report	2	0	0	0	1	2	3
VI	17120SEC06A	Skill Based Elective – VI	Learn to create animated graphics, add sound and interactivity.	1	0	1	0	1	2	2
			Can develop Website	2	1	1	1	1	2	2
			CD based presentations	3	1	1	1	1	2	2
VI	17111SEC06L	Communicative	Apply study skills	3	0	0	1	1	1	2

		English Lab-VI	Widen creative thinking	3	0	0	1	1	1	1
			Be a good team worker	3	2	1	2	1	1	1
			Make them proficient in English	1	1	1	3	1	1	1

1- Low, 2-Medium, 3- Higher, 0 No correlation

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School of Arts and Science
Department of Biotechnology
17PGBTGEC
2017 Regulation
Program Outcomes and Course outcomes of
M.Sc., Mapping of COs and POs

Semester	Course Code	Title of the Course	COs	POS					
				PO1	PO2	PO3	PO4	PO5	PO6
I	17217SEC11	General Microbiology	Students can gain the idea of how to identify the microorganisms based on the modern polyphasic approach.	3	1	0	1	2	2
	17217SEC12	Molecular genetics	After successful completion of the paper the students will get an overall view about genetic makeup of organisms and can take up a career in research.	2	0	0	1	2	2
	17217SEC13	Biochemistry	This paper in biochemistry has been designed to provide the student with a firm foundation in the biochemical aspects of cellular functions which forms a base for their future research.	3	0	0	3	2	2
	17217SEC14L	Microbiology & Molecular Genetics Lab	After successful completion of the paper the students will get an overall view about genetic Make up of organisms and can take up a career in research.	2	2	1	0	1	2

	17217DSC15A	Immunology	This course will provide the student insights into the various aspects of Immunology such as classical immunology, clinical immunology, Immunotherapy and diagnostic immunology.	2	1	1	0	0	1
	17217DSC15B	Biosafety and Biodiversity	To study the diversity of plants and animal life in a particular habitat, ethical issues and potential of biotechnology for the benefit of man kind	3	1	1	2	2	1
	17216RLC16	Research Led Seminar	Exposure to various research domains	3	2	1	0	2	2
			Acquaintance with languages of research	3	2	2	0	0	1
			Development of research aptitude	2	1	1	2	2	1
II	17217SEC21	Cell & Molecular Biology	Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields.	2	1	1	1	1	1
	17217SEC22	Biophysics & Bioinformatics	This paper has been designed to give the students comprehensive training in the emerging and exciting upcoming filed of Systems Biology, which will help students to get career in both industry/R&D.	2	1	1	2	1	1
	17217SEC23	Industrial Biotechnology	This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment-friendly processes such as green manufacturing technologies and sustainable development.	2	1	0	1	1	1

	17217SEC24L	Molecular Biology & Industrial Biotechnology Lab	Students after completion of this paper will be exceptionally well prepared to pursue careers in cellular and sub cellular biological research, biomedical research, or medicine or allied health fields	2	1	0	0	1	2
	17217DSC25A	Endocrynology	To know the pathophysiological significance of the system with special reference to humans.	1	2	0	1	1	3
	17217DSC25B	Intellectual Property Rights	To get registration in our country and foreign countries of their invention, designs and thesis or theory written by the students during their project work and for this they must have knowledge of patents, copy right, trademarks, designs and information Technology Act. Further teacher will have to demonstrate with products and ask the student to identify the different types of IPR'	2	2	1	1	2	2
	17217RMC26	Research Methodology	Understanding research questions and tools	1	2	1	1	2	2
			Experience in scientific writings	3	1	1	0	2	1
			Practice in various aspects of scientific publications	3	1	1	0	2	1
			Inculcation of research ethics	3	1	1	1	2	1
	17217BRC27	Participation in Bounded Research	Hands on exposure to problem solving tools in contemporary research	3	0	0	2	1	2
			Evolution of research intuitiveness and orientation	3	1	0	3	1	1
			Familiarity with cutting edge research trends	2	1	0	3	1	1
III	17217SEC31	Recombinant DNA technology	Utilize the knowledge on creation of a genomic library	2	2	0	3	2	1
			Explain the significance of model organisms in recombinant DNA technology	1	1	0	1	1	1

			This course teaches rDNA technology techniques and their application in the field of genetic engineering They learn about plasmids, vectors and gain knowledge on the construction of cDNA libraries	1	1	1	1	1	1
	17217SEC32	Plant Biotechnology	Understand the basic principles of plant kingdom and their economic importance.	2	1	1	1	1	1
			Explain the basics, methodology and applications of plant tissue culture.	3	0	2	2	2	1
			Conceptualize plant transformation, selection of desirable genes for crop improvement, design binary vector and procedure for generating GM crops.	2	1	1	1	2	2
	17217SEC33	Animal Biotechnology	To learn basic cell culture, type, subculture media preparation and applications	2	1	2	1	1	2
			To understand the difference between stem cell types and methods for producing transgenic animals	2	2	2	1	1	2
			To improve artificial embryo transfer and nuclear transfer methods and applications	2	0	0	1	1	2
	17217SEC34L	DNA technology & Animal biotechnology-lab	Describe the different types of blood groups and different types of blood cells and their function in the human body.	2	0	0	1	1	2
			Learn various techniques like Immunoelectrophoresis, ELISA, Immunoprecipitation etc.	2	1	1	1	1	2
			Culture and maintain animal cell cultures, various method of preservation and counting of viable cells.	3	0	1	1	1	2

	17217DSC34A	Nanobiotechnology	This course will act as a bridge between students from non-biology course at all levels	2	1	1	1	1	1
	17217DSC34B	Environmental biotechnology	This course is important in the era of industrialization leading to environmental hazards and hence will help students to take up a career in tackling industrial pollution and also who is willing to take up the research in areas like development of biological systems for remediation of contaminated environments (land, air, water), and for environment- friendly processes such as green manufacturing technologies and sustainable development	3	0	1	0	2	1
IV	17217SRC37	Participation in Scaffold Research	Acquired detailed knowledge of antimicrobial agents, their mechanism of action	2	1	1	0	1	1
			Developed understanding of different types of disinfectants/antiseptics bactericidal and bacteriostatic actions	3	1	2	0	2	1
			Regulatory practices, biosensors and applications in Pharmaceuticals	2	1	0	1	2	1
			Quality Assurance and Validation	2	0	0	1	2	2
	17217PRW41	Project work	Experience from a master's project and international literature.	1		0	1	2	2
			Develop ability to independently carry out a complete scientific process.	1	1	1	1	1	2
			Learn about how to write dissertations and proposals for the scientific community.	1		0	1	1	2

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