MAHENDRA ARTS & SCIENCE COLLEGE

(Autonomous)

Affiliated to Periyar University, Salem.

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Kalippatti – 637 501, Namakkal (Dt), Tamil Nadu.

DEPARTMENT OF BIOTECHNOLOGY

COURSE OUTCOMES (COs)

B.Sc. BIOTECHNOLOGY

PRINCIPAL
MAHENDRA ARTS & SCIENCE COLLEGE
(Autonomous)
Kalippatti (PO) - 637 501, Namakkal (DT)

For the students admittedfrom the Academic Year 2019-2020 onwards

SEMESTER I

Core - I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBT01	CELL BIOLOGY	
Credit: 4		

Objectives

To understand the structure and the functions of prokaryotic and eukaryotic cells.

To study about specialized cells and cell organelles.

To impart knowledge about cell division and structural organization of chromosomes.

To study about the cell signaling pathways.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the fundamental principles of cell structure, organization, cell division and signaling.	K1
CO2	Understand the structure and function of cellular components, organelles, chromosome, cell signaling pathway.	K2
CO3	Explain the process events of cell division, cell cycle and cell adhesions.	K3
CO4	Classify prokaryotic and eukaryotic cell structure and its functions with suitable examples.	K4

SEMESTER I

Allied - I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBCA01	BIOCHEMISTRY - I	
Credit: 4		

Objectives

To study the structure and function of biomolecules (proteins, lipids, and carbohydrates) found in living cells.

To provide fundamental knowledge and overview about enzymes and nucleic acids.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the structures of Carbohydrates, amino acids and enzymes.	K1
CO2	Understand the biological functions and properties of bio-molecules.	K2
CO3	Explain the bio chemical compounds in the Cells and organelles.	K3
CO4	Classify the significance of essential and non-essential amino acids, fatty acids and it's applications in living systems.	K4

SEMESTER I

Core: Practical-I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTP01	PRACTICAL - I - CELL BIOLOGY	
Credit: 3		

Objectives

To provide better practical knowledge and training on microscopes, cell counting methods, and staining of macromolecule in plant and animal cells.

SEMESTER – I

Allied Practical- I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBCAP01	ALLIED PRACTICAL - I - BIOCHEMISTRY-I	
Credit: 3		

Objectives

To provide practical knowledge on extraction of starch, casein, and lecithin from biological samples.

To perform the qualitative analysis carbohydrate and protein samples.

To determine the acid and saponification number of fat and salivary amylase enzyme activity.

SEMESTER – I

Value Education	B.Sc. Biotechnology	2019 - 2020
Code: M19UVE01	மனவளக்கலை யோகா	
Credit: 2		

பாடநோக்கம்

இளம் வயது முதல், உடல், மனம் இரண்டையும் பக்குவமாக வைத்துக் கொள்ள வேண்டியதன் அவசியத்தை மாணவர்களுக்கு உணரச் செய்தல்.

SEMESTER II

Core - II	B.Sc. Biotechnology	2019 - 2020
Code: M19UBT02	PLANT BIOLOGY	
Credit: 4		

Objectives

To understand classification systems of plants, structure and modifications of root, stem, leaf and flowers.

To impart specific knowledge on pathways involved in plant systems and fertilization takes place in plants.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the fundamental principlesplant biology and classification systems up to class level.	K1
CO2	Understand the structure, modifications of root, stem, leaf and types of flowers,fruits, seeds.	K2
CO3	Apply the concepts of fertilization and methods of pollinations.	K3
CO4	Analyze the taxonomy structure, plant microbial interactions, and the role ofelectrons in photosynthesis.	K4

SEMESTER II

Allied - II	B.Sc. Biotechnology	2019 - 2020
Code: M19UBCA02	Allied - II - BIOCHEMISTRY – II	
Credit: 4		

Objectives

To provide knowledge about the synthesis and metabolisms of bio-molecules, metabolic pathways and their regulations in living cells.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the concepts of thermodynamics and metabolism	K1
CO2	Understand the thermodynamic principles and mechanisms in respiration.	K2
CO3	Apply various metabolic pathways and their control mechanisms. Role of vitamins and hormones in cell metabolisms	K3
CO4	Analyze the nature of the carbohydrate, protein, lipids and vitamins cell metabolisms	K4

SEMESTER II

Core Practical-II	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTP02	PRACTICAL - II - PLANT BIOLOGY	
Credit: 3		

Objectives

To understand different plant families description on its morphology, and LS and CS of monocot, dicot. The concept of osmosis and photosynthesis of oxygen evolution by hands on training.

SEMESTER II

Allied Practical - II	B.Sc. Biotechnology	2019 - 2020
Code: M19UBCAP02	ALLIED PRACTICAL - II - BIOCHEMISTRY - II	
Credit: 3		

Objectives

To give hands on training on qualitative analysis of biomolecules, paper chromatography, thin layer chromatography and quantitative titration and colorimetric methods to determine the amount of biomolecules in the sample.

SEMESTER II

ECC-I	B.Sc. Biotechnology	2019 - 2020
Code: M19UES01	ENVIRONMENTAL STUDIES	
Credit: 2		

Objectives

This course provides the basic idea about our environment ecosystem, natural resources, pollution and environmental policies and practices.

Course Outcomes

After completing this course, students will be able to:

CO Number	CO Statement	Knowledge Level
CO1	Describe the natural resources, conventional and non-conventional sources of energy and their advantages and disadvantages.	K1
CO2	Understand the environment in terms of ecosystem and its structural and functional aspects.	K2
CO3	Apply the knowledge about various concepts and issues in the environment including biodiversity conservation	K3
CO4	Analyze the various types of pollution, pollutants, nuclear and natural hazards. It emphasis on human health impact, mitigation measures and implementation of environmental Acts for control of pollution.	K4

SEMESTER III

Core - III	B.Sc. Biotechnology	2019 - 2020
Code: M19UBT03	ANIMAL SCIENCE	
Credit: 4		

Objectives

To understand the animal classification, taxonomy, diversity, structure and functions of the organ and organ systems.

Course Outcomes

After completing this course, students will be able to:

CO Number	CO Statement	Knowledge Level
CO1	Describe the classification and nomenclature of invertebrates and vertebrates	K1
CO2	Understand the types, structure and functions of animal tissues	K2
CO3	Judge anatomy and physiology of different systems	K3
CO4	Categorize the reproduction and fertilization changes	K4

SEMESTER III

Allied -III	B.Sc. Biotechnology	2019 - 2020
Code: M19UMBA01	ALLIED - III - BASIC MICROBIOLOGY	
Credit: 4		

Objectives

The main objective of the course is to provide knowledge on the understanding of the concepts and fundamental principles of microbiologyand basis to face the study of the bacteriology, virology, Phycology and Mycology which includes key features of the structure, growth, physiologyand behavior of bacteria, viruses, fungi, algae and protozoa.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the history, development and the basic principles of microbiology	K1
CO2	Understand the microbial diversity, Systems of Classification taxonomy and dynamics of microbes	K2
CO3	Apply the knowledge about various types of microbes and its structural aspects	K3
CO4	Identify the pathogenic microbes, pathogenesis and its prevention measures	K4

SEMESTER III

Core Practical-III	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTP03	PRACTICAL - III - ANIMAL SCIENCE	
Credit: 3		

Objectives

To give hands on training to study anatomy of the animals and provide technical skills in microscopic observation of museum specimens mounting, spotters and dissections.

SEMESTER III

Allied Practical-III	B.Sc. Biotechnology	2019 - 2020
Code: M19UMBAP01	ALLIED PRACTICAL - III - BASIC MICROBIOLOGY	
Credit: 3		

Objectives

To provide good laboratory practices about basics of microbiology techniques.

SEMESTER III

SKILL ENCHANCEMENT COURSES – I

SEC - I	B.Sc. Biotechnology	2019 - 2020
Code:M19UBTS01	SEC - I - BIOPHYSICS AND BIOINSTRUMENTATION	
Credit: 2		

Objectives

To provide the basic knowledge about basic principles and working mechanism of bioinstrumentation techniques involved in separation, identification and purification of biological substances.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the basic concepts of chemical bonds and instrumentation principles	K1
CO2	Understand the various types of microscope	K2
CO3	Apply various physical laws depending upon their applications and properties	K3
CO4	Analyze the various sample using biological instruments	K4

SEMESTER IV

Core - IV	B.Sc. Biotechnology	2019 – 2020
Code:M19UBT04	GENETICS AND MOLECULAR BIOLOGY	
Credit: 4		

Objectives

To understand the central theories and methodologies that defines the field of genetics and molecular biology.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the fundamental principles of Mendelian, non-Mendelian and extended inheritance with example	K1
CO2	Understand the chromosomal aberrations, genetic disorders and genome organization in bacteria, plant and animal	K2
CO3	Apply the structure, formation and function of DNA, RNA and describe the prokaryotic and eukaryotic cells replication, different types of mutations and DNA-repair system	K3
CO4	Analyze the microbial genetics, biology of N_2 fixation and molecular marker techniques	K4

SEMESTER IV

Allied- IV	B.Sc. Biotechnology	2019 – 2020
Code: M19UMBA02	ALLIED- IV - APPLIED MICROBIOLOGY	
Credit: 4		

Objectives

To understand the basic principles of Microbiology and their applications.

To create awareness of microbial diseases and causes of human beings.

To understand the application of microbes involved in food, environment and industries.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the principles of sterilization, antibiotics mode of action and culture techniques	K1
CO2	Understand the Morphology, culture, biochemical, pathogenicity, laboratory diagnosis of microbial diseases	K2
CO3	Explain the various factors affecting food and dairy industry	K3
CO4	Analyze microorganisms in biodegradation and bioconversion	K4

SEMESTER IV

Core Practical- IV	**B.Sc. Biotechnology**	**2019 - 2020**
Code: M19UBTP04	**PRACTICAL - IV - GENETICS AND MOLECULAR BIOLOGY**	
Credit: 3		

Objectives

To give hands on training in theoretical and practical introduction to important methods and techniques in genetics and molecular biology.

SEMESTER IV

Allied Practical-IV	**B.Sc. Biotechnology**	**2019 - 2020**
Code: M19UMBAP02	**PRACTICAL - IV - APPLIED MICROBIOLOGY**	
Credit: 3		

Objectives

To give hands on training on applied microbiological techniques. It includes identification of bacteria, culture characterization on different media, growth pattern and determination of water portability.

SEMESTER IV

SKILL ENCHANCEMENT COURSES – II

SEC - II	B.Sc. Biotechnology	2019 – 2020
Code: M19UBTS02	SEC - II - BIOINFORMATICS	
Credit: 2		

Objectives

To understand the creation and development of databases, software, computational, statistical techniques and also solving problems generated from the management and analysis of biological data.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the fundamental principles bioinformatics and understand the concept of website and its application	K1
CO2	Understand the useful and application of database search both sequence and structural databases	K2
CO3	Apply the tools and algorithms for phylogenetic tree	K3
CO4	Analyze structure of nucleotide using gene prediction tools	K4

SEMESTER V

Core - V	B.Sc. Biotechnology	2019 - 2020
Code: M19UBT05	IMMUNOLOGY	
Credit: 4		

Objectives

To understand different attributes of immune system, immune mechanism and its responses in living beings.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the history, types of immune system and the organs involved	K1
CO2	Understand the antigen characteristics and its activation	K2
CO3	Discover diagnostic methods of antigen and antibody interaction and the gene expression	K3
CO4	Analyze transplantation and autoimmunity systems	K4

SEMESTER V

Core - VI	B.Sc. Biotechnology	2019 - 2020
Code: M19UBT06	rDNA TECHNOLOGY	
Credit: 4		

Objectives

To understand basic principles and methods of rDNA technology and to provide knowledge about enzymes and vectors involved in rDNA technology, DNA amplification, hybridization techniques, gene transfer methods and transgenic products.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the fundamental principles rDNA technology, DNA modifying enzymes	K1
CO2	Understand the various types of vectors involved in rDNA technology	K2
CO3	Explain deeper understanding DNA hybridization, sequencing methods	K3
CO4	Analyze the transgenic plants and animals and Pharmaceutical products.	K4

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SEMESTER V

Core – VII	B.Sc. Biotechnology	2019 - 2020
Code: M19UBT07	BIOPROCESS TECHNOLOGY	
Credit: 4		

Objectives

To understand the various fermentation techniques in Bioprocess.

To learn about the technical and biological aspect of microbial utilization for production and purification of metabolites.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	Statement	Knowledge Level
CO1	Describe the methods of involved in the microbial technology	K1
CO2	Understand the designing of bioreactors and control necessary for enhancing production	K2
CO3	Apply the knowledge about media optimization for production of microbial metabolites	K3
CO4	Analyze the production methods of industrially important enzymes, antibiotics by downstream process	K4

SEMESTER - V

Elective

Elective - I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTE01	BIOETIHCS AND BIOSAFETY	
Credit: 4		

Objectives

To focus on health, maintenance of body weight and dieting. To impart Knowledge about personal hygiene, food contamination and role of international control of health and role of WHO.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the basic concept of bioethics nationally and internationally	K1
CO2	Understand the principles of bioethics and ethics in molecular technology and post genomic era	K2
CO3	Judge the intellectual property rights, WIPO, GATT, and TRIP	K3
CO4	Analyze the concept bio-safety, health hazards in bio-safety	K4

SEMESTER V

Elective - I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTE02	DEVELOPMENTAL BIOLOGY	
Credit: 4		

Objectives

To provide a broad, comprehensive look at embryology with special emphasis on vertebrate models, focusing on both classical experiments and modern molecular and genetic techniques.

To understand the mechanisms involved in growth and development of complex organisms.

Course Outcomes

Students who successfully complete the course will be able to:

CO Number	CO Statement	Knowledge Level
CO1	Describe the types and stages of sexual cycle and gametogenesis	K1
CO2	Understand the concepts and methods of assisted reproductive techniques for conservation of wild, rare or indigenous ungulates and solve the infertility problems	K2
CO3	Show the knowledge about assisted reproductive technology	K3
CO4	Analyze the embryogenesis, molecular development of plants and animals	K4

SEMESTER – V

Elective -I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTE03	NURSERY AND GARDENING	
Credit: 4		

Objectives

To focus on basic principles and methods of nursery and gardening.

To provide knowledge about seed types, seed structure, vegetative propagation and various types of vegetable cultivation.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the basic concept of nursery, infrastructure and planting.	K1
CO2	Understand the basic knowledge about seeds structure, types, storage and production technology.	K2
CO3	Apply the knowledge about vegetative propagation, hardening of plants and green house.	K3
CO4	Analyze the suitable techniques in nursery and gardening	K4

SEMESTER V

Elective-I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTE04	HERBAL TECHNOLOGY	
Credit: 4		

Objectives

To impart complete knowledge about herbal medicines, phytoconstituents and their importance in drug designing and disease management.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe knowledge about history and importance of herbal medicines	K1
CO2	Understand the basic principles, chemical constituents of plant and its systemic position	K2
CO3	Apply the phytochemical extraction techniques in the pharmaceutical industry.	K3
CO4	Analyze the various herbal extraction for phytochemical screening	K4

SEMESTER V

Core Practical-V	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTP05	PRACTICAL - V - IMMUNOLOGY AND rDNA TECHNOLOGY	
Credit: 3		

Objectives

To provides hands on training in the field of immunology and rDNA technology methods like blood sample analysis, WBC and RBC count, agglutination tests, precipitation tests.

To provide knowledge about the plasmid DNA isolation, restriction digestion, ligation and transformation.

SEMESTER V

Core Practical – VI	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTP06	PRACTICAL - VI - BIOPROCESS TECHNOLOGY	
Credit: 3		

Objectives

To provide good laboratory practices in the aspect of microbial utilization for production and purification of metabolites.

SEMESTER V

SEC-III	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTS03	SEC - III - INDUSTRIAL BIOTECHNOLOGY AND IPR	
Credit: 2		

Objectives

To understand the principles, methods and application of industrial biotechnology.

To know about the legal issues affecting the biotechnology research.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the fundamental principles, methods and application of various biotechnology food industries	K1
CO2	Understand the microbial production and its control methodology	K2
CO3	Apply the principle and methods in industrial biotechnology for production bio-products	K3
CO4	Analyze the industrial biotechnological products for betterment of mankind	K4

SEMESTER VI

Core – VIII	B.Sc. Biotechnology	2019 – 2020
Code: M19UBT08	PLANT AND ANIMAL BIOTECHNOLOGY	
Credit: 4		

Objectives

To provide complete knowledge about plant and animal tissue culture techniques and their application.

To educate the elementary techniques for crop improvement and establishment of cell lines and monoclonal antibodies production.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the fundamental knowledge about plant tissue culture methods	K1
CO2	Understand the protoplast technology, somaclonal variation, Cryopreservation and secondary metabolites production	K2
CO3	Choose the suitable *invitro* culture techniques of plants and animals	K3
CO4	Analyze the suitable methods for propagation of plant and animal cells	K4

SEMESTER VI

Core – IX	B.Sc. Biotechnology	2019 – 2020
Code: M19UBT09	ENVIRONMENTAL BIOTECHNOLOGY	
Credit: 4		

Objectives

To focus on the types of pollution and their microbial remediation.

To provide a foundation for biodiversity and its conservation.

Course Outcomes

By the end of the course, the student should be able to:

CO Number	CO Statement	Knowledge Level
CO1	Describe the scope and importance of environmental biotechnology	K1
CO2	Understand the various types of Pollution and its control methods	K2
CO3	Apply the principles and methods of Biodegradation for removal of toxic components	K3
CO4	Analyze the polluted areas for bioremediation process	K4

SEMESTER VI

Elective-II	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTE05	FOOD BIOTECHNOLOGY	
Credit: 4		

Objectives

To impart knowledge about food processing techniques, microbes associated with food and general procedure for food plant design, operation and quality checking.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe about scope and important of food biotechnology	K1
CO2	Understand the various types of food borne pathogens, food colorants and maintenance of food quality in food industry	K2
CO3	Apply the basic principles and methods for food productions	K3
CO4	Analyze the various forms of food quality control measures	K4

SEMESTER VI

Elective-II	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTE06	MICROBIAL DISEASE AND CONTROL	
Credit: 4		

Objectives

To provide a brief knowledge about microbial pathogens (viral, bacterial, fungal, protozoan and parasitic) and its control measures.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the various types of microbial pathogens and its control measures	K1
CO2	Understand the host microbial interactions and pathogenesis	K2
CO3	Solve the microbial infections and its prevention measures	K3
CO4	Analyze the clinical Specimens for disease identification and its treatment process	K4

SEMESTER VI

Elective- II	B.Sc., Biotechnology	2019 - 2020
Code: M19UBTE07	PHARMACEUTICAL BIOTECHNOLGY	
Credits : 4		

Objectives

To focus on fundamental principles of Pharmacology, measurement of drug action.

To understand chemotherapeutic drugs mechanism, toxicology, drug evaluation.

To impart knowledge about therapeutic protein and tissue engineering.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the fundamental principles of Pharmacology, drug classification and drug action and pharmacokinetics of chemotherapeutic drugs	K1
CO2	Understand the knowledge of Chemo therapeutic drugs, anti-cancer and anti Inflammatory drugs.	K2
CO3	Apply the techniques for production of pharmaceutical products	K3
CO4	Analyze the skill for production various types of anti-drugs	K4

SEMESTER VI

Elective – II	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTE08	INDUSTRIAL SAFETY	
Credit: 4		

Objectives

To teach student the concept of Industrial Safety and provide useful practical knowledge for workplace safety.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the industrial plant design and basic rules	K1
CO2	Understand the chemical hazards and safety	K2
CO3	Apply the knowledge about analysis various types of hazards	K3
CO4	Analyze the mechanisms of biosafety measurements in industry	K4

SEMESTER VI

Core Practical-VII	**B.Sc. Biotechnology**	**2019 - 2020**
Code: M19UBTP07	**PRACTICAL - VII - PLANT AND ANIMAL BIOTECHNOLOGY**	
Credit: 3		

Objectives

To provide hands on training in the field of plant and animal biotechnology with familiarize the following techniques like plant and animal tissue culture media preparation, protoplast isolation, genomic DNA isolation, trypsinization, chick embryo fibroblast culture, virus cultivation.

SEMESTER VI

Core Practical-VIII	**B.Sc. Biotechnology**	**2019 - 2020**
Code: M19UBTP08	**PRACTICAL-VIII - ENVIRONMENTAL BIOTECHNOLOGY**	
Credit: 3		

Objectives

To examine water quality parameters from water samples collected from polluted environment by using biotechnological methods.

SEMESTER VI

SKILL ENCHANCEMENT COURSES - V

SEC - IV	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTS04	SEC - IV - NANO-BIOTECHNOLOGY	
Credit: 2		

Objectives

To understand the methods of nanoparticles preparation, characterization and its applications in various fields of science for the welfare of human as well as for environment.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe basic concepts and terminologies of Nanobiotechnology	K1
CO2	Understand the nanomaterials preparation and its uses in biological fields	K2
CO3	Apply knowledge about nanomaterials, biosensors, drug designing and imaging techniques in modern medicine	K3
CO4	Analyze the various types of nano drugs and its delivery systems.	K4

SEMESTER VI

Self-Employment Course

JOC-I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTJ01	DIAGNOSTICS BIOTECHNOLOGY	
Credit: 3		

Objectives

To understand the common procedures used in disease diagnosis.

To be familiar with various types of diseases diagnosis methods.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the techniques used for the diagnostic using enzymes	K1
CO2	Understand the concept of molecular techniques used diagnosis of diseases	K2
CO3	Apply the knowledge about diagnosis of antigen and antibody in clinical laboratory	K3
CO4	Analyze the pathogen by using advanced molecular tools	K4

SEMESTER VI

JOC-I	B.Sc. Biotechnology	2019 - 2020
Code: M19UBTJ02	FOOD PROCESSING TECHNOLOGY	
Credit: 3		

Objectives

To develop skill in food processing (fruits and vegetables), operation and maintenance of modern equipments.

To understand the quality assurance and process of packaging, storing and marketing.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe about food processing, preservation and packing	K1
CO2	Understand the basic principles of composition and nutritive value of pulses and cereals	K2
CO3	Apply knowledge about fruit, vegetable Processing and preservation by various techniques	K3
CO4	Analyze the different types flusy, sea food processing and storage products	K4

SEMESTER III

Non-Major Elective Courses

NMEC – I	**B.Sc. Biotechnology**	**2019 - 2020**
Code: M19NBT01	**NMEC - I - HEALTH AND HYGIENE**	
Credit: 2		

Objectives

To focus on health, maintenance of body weight, dieting.

To knowledge about personal hygiene, food contamination, role of International control of health and WHO.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the basic concept of health and ecological aspects in human health	K1
CO2	Understand the concept of body weight, BMI and diet	K2
CO3	Apply the necessity of exercise, weight control program and dieting	K3
CO4	Analyze the food contamination and methods of disease transmission	K4

SEMESTER III

NMEC-I	B.Sc. Biotechnology	2019 - 2020
Code: M19NBT02	NMEC - I - FOOD AND NUTRITION	
Credit: 2		

Objectives

To describe the basic aspects of nutrients and to understand therelationship between food, nutrition and health.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the basic concepts of food sources, and nutritional deficiency	K1
CO2	Understand the concepts of composition, functions, sources of food and nutrition	K2
CO3	Discover nutritional elements of various food sources	K3
CO4	Analyze macro and micro-minerals with sources, and effect of deficiency	K4

SEMESTER IV

Non-Major Elective Courses

NMEC-II	**B.Sc. Biotechnology**	**2019 – 2020**
Code: M19NBT03	**NMEC - II - ENTREPRENEURSHIP IN BIOTECHNOLOGY**	
Credit: 2		

Objectives

To gain entrepreneurial skills in the field of mushroom cultivation, vermicomposting, hydrophonics, aquaphonics, home gardening, roof top gardening, sericulture and apiculture venture creation.

Course Outcomes

By the end of the course, the student should be able to:

CO Number	CO Statement	Knowledge Level
CO1	Describe the scope and importance of entrepreneurship in biotechnology	K1
CO2	Understand the principles, methods and application of mushroom, vermicomposting, SCP cultivation	K2
CO3	Apply the methods of vermicomposting, mushroom, SCP and *Azolla*	K3
CO4	Analyze the various nutritional values of biological products	K4

SEMESTER IV

NMEC-II	B.Sc. Biotechnology	2019 - 2020
Code: M19NBT04	NMEC-II - AGRICULTURAL BIOTECHNOLOGY	
Credit: 2		

Objectives

To introduce the principles, practices and application of agriculturalbiotechnology.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the basic principles of crop improvement, plant breeding, micro-propagation in agricultural field	K1
CO2	Understand the mechanism of biological nitrogen fixation, production of bio-fertilizers and applications	K2
CO3	Apply the microbes in bio-fertilizers and bio-pesticides	K3
CO4	Analyze a nutritional value of biofertilizer and plant growth quality modifications	K4

Head of the Department

HEAD OF THE DEPARTMENT
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Principal

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DEPARTMENT OF BIOTECHNOLOGY

PROGRAMME OUTCOMES (POs) OF B.Sc. BIOTECHNOLOGY

Academic year 2020-2021

PO1: Graduates will gain basic knowledge of Biotechnology, Science and Technology concepts.

PO2: Graduates will be able to understand appropriate tools and techniques in biotechnological manipulation.

PO3: Graduates will be able to apply biotechnological practices in health and environmental issues.

PO4: Graduates to analyze the biological products/concepts using biotechnological tools.

Head of the Department

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DEPARTMENT OF BIOTECHNOLOGY

PROGRAMME SPECIFIC OUTCOMES (PSOs) OF B.Sc. BIOTECHNOLOGY

Academic year 2020-2021

PSO 1: Apply knowledge and excel in various research fields of biological sciences in the following specific area of cell Biology, biochemistry, plant biology, animal science, rDNA technology, microbiology, biophysics, bioinstrumentation, genetics and molecular biology, bioinformatics, immunology, bioprocess technology, plant and animal biotechnology, environmental biotechnology, Nano biotechnology, etc.

PSO 2: Understand the fundamental technical skills need, functioning and application of basic and higher necessity tools for a basic and improved knowledge in the experimental strategies for analysis and interpretation of data in scientific manner and adopt code of ethics in professional and social context and legal behaviors in decision making.

PSO 3: Apply learned fundamental technical knowledge and biotechnological principles to find practicable solutions to technological challenges and problems and graduates will be able to realization of cultural, social and ethical acceptance to impart sound minds and make better society.

PSO 4: Adopt new and innovative technology in the field of biotechnology and allied industries for designing, developing and providing solutions for product development, by continuously updating their knowledge for achieving personal and organizational development.

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