

SEMESTER -1
COURSE NAME: BIOMOLECULES AND ANALYTICAL TECHNIQUES (THEORY)
COURSE CREDITS: 4

COURSE OBJECTIVES:

To enable the students to-

- Comprehend the structure, properties and functions of biomolecules.
- Get an insight in to the structure and functions of nucleic acids, vitamins and bio-energetics.
- Expertise in characterization of biomolecules using analytical techniques.
- Attain the knowledge on spectral analysis of biomolecules, Microscopy and Radio activity.
- Understanding the basic concepts of Statistics.

COURSE OUTCOMES:

Students will get-

- CO 1:** Be aware of structure and properties of carbohydrates, amino acids, proteins and lipids.
- CO 2:** Be familiarized with DNA and RNA; and have insight into glucose metabolism.
- CO 3:** Be acquainted with different methods in centrifugation, Chromatography & Electrophoresis.
- CO 4:** Be proficient in concepts of Spectroscopy, Microscopy and Radioactivity
- CO 5:** Acquire knowledge on concepts of Biostatistics




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER-2
COURSE NAME: MICROBIOLOGY, CELL BIOLOGY AND MOLECULAR BIOLOGY (Theory)
COURSE CREDITS: 3

COURSE OBJECTIVES:

To enable students to

- Comprehend the historical perspective of Microbiology
- Be an expertise in techniques of studying and culturing of microorganisms.
- Get knowledge on classification microbes ; Structure and reproduction of various plant, animal and bacterial viruses
- Understand the structure and functions of cellular organelles and cell division
- Understand the organization of and function of DNA and RNA at molecular level
- Comprehend the concepts of gene expression and regulation of gene expression.

COURSE OUTCOMES:

Students will get

CO 1: Have insight into microbial world and the ultra structure and physiology of microbes, versatile knowledge in Bergey's manual of classification.

CO 2: Strong intention will be developed in culturing various microorganisms. Thorough knowledge on structure and replication of viruses and their pathogenicity. Handle the septic and unhygienic conditions with a variety of sterilization techniques.

CO 3: Be acquainting with the ultra structure of cell organelles, cell cycle and cell division.

CO 4: Have a thorough knowledge of genome organization, DNA replication, DNA damage & repair and regulation of gene expression.

CO 5: Will be introduced to mechanism of DNA transcription and protein synthesis in both prokaryotes and eukaryotes.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER 2
COURSE NAME: MICROBIOLOGY, CELL BIOLOGY AND MOLECULAR BIOLOGY (Practical)
COURSE CREDITS: 1

COURSE OBJECTIVES:

To enable the students to

- Acquire knowledge in usage of various instruments in microbiology laboratory
- Attain comprehensive knowledge on sterilization.
- Be able to distinguish and identify the microbes by various techniques.
- Be an expert in pure culture techniques and identification of cell division stages
- Able to isolate microbe genetic material.

COURSE OUT COMES:

Students will get

CO 1: Hands on expertise on various instruments

CO 2: Be able to design various sterilization methods

CO 3: Be skilful in characterization of microbes.

CO 4: Be acquaint on isolation and maintenance of pure cultures, able to distinguish various cell division stages

CO 5: Be expert in extraction and quantification of nucleic acids.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER -3
COURSE NAME: IMMUNOLOGY AND r DNA TECHNOLOGY (Theory)
COURSE CREDITS: 4

COURSE OBJECTIVES:

To enable the students to

- Acquire knowledge in fundamentals of immunology like antigen, antibody, types of immunity, cells of immune system and organs of immune system
- Attain comprehensive knowledge on vaccines, types of vaccines, hybridoma technology, Ag-Ab reactions, hyper sensitivity and auto immunity.
- Learn various tools and techniques in r DNA technology. Isolation of gene, vectors and gene sequencing methods.
- Able to understand construction of r DNA, applications of r DNA technology in agriculture and medicine.
- Acquire knowledge on basic concepts in Biostatistics.

COURSE OUTCOMES:

Students will get

CO 1: Have an insight in basic aspects of immune system and immune response.

CO 2: Understand about different types vaccines currently in use, various allergy reactions and well versed with the concept of Immune diagnostics and auto Immunity.

CO 3: Accustomed with the tools and techniques of genetic engineering, molecular cloning and expression vectors. These powerful techniques allow the researcher to manipulate the DNA.

CO 4: Gain knowledge about importance of r DNA technology in agriculture and medicine.

CO 5: Learn about different types biological data bases and nucleotide and protein blast analysis by various software tools.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER- 3
COURSE NAME: IMMUNOLOGY AND r DNA TECHNOLOGY LAB (Practical)
COURSE CREDITS: 1

COURSE OBJECTIVES:

To enable the students to:

- Comprehend the concepts of immunodiagnostic tests.
- Enable the students to learn the techniques of Genetic engineering
- Acquire the knowledge on analysis of genetic material
- Strengthen the theoretical knowledge on certain concepts like organs of immune system, PCR and blotting techniques.

COURSE OUT COMES:

Students will

CO 1: Be expertise in analysing the clinical samples through immunodiagnostic methods.

CO 2: Capable to optimizing the protocols for analysing the DNA samples.

CO 3: Understand the theoretical concepts in multiplication of DNA by PCR, production of antibodies, Lymphoid organs and blotting techniques.

CO 4: To learn about production of antibodies used to eliminate antigens or pathogens.

CO 5: To understand the concepts of Bioinformatics.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER – 4
COURSE NAME: PLANT AND ANIMAL BIOTECHNOLOGY (Theory)
COURSE CREDITS: 4

COURSE OBJECTIVES:

To enable the students to

- Acquire knowledge about plant tissue culture and preparation of culture medium.
- Understand various laboratory protocols for cultivation of plant cells
- Acquaint in various gene transfer mechanisms.
- Study animal biotechnology which includes Artificial insemination, invitro fertilization and embryo transfer mechanisms
- Aware of Bio ethics, bio-safety guidelines and Intellectual property rights.

COURSE OUTCOMES:

Students will get

CO 1: Capable to prepare different types of nutrient media and able to culture plant cells and tissues in laboratory.

CO 2: Be abundant in producing transgenic plants

CO 3: Able to evaluate animal culture media constituents and their role in the culture and maintenance of animal cells and preservation.

CO 4: Familiarize with invitro fertilization with regard to transgenic animal production.

CO 5: awareness about Bio ethics, bio-safety guide lines and IPR issues.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER -4
COURSE NAME: PLANT AND ANIMAL BIOTECHNOLOGY (Practical)
COURSE CREDITS: 1

COURSE OBJECTIVES:

To enable the students to

- Be proficient in designing protocols for media preparation.
- To acquire the techniques and inoculation methods in plant tissue culture.
- Be skilful in protocols for preservation of tissue culture plants.
- Understand the concepts of animal cell culture.
- Attain knowledge about ELISA.

COURSE OUTCOMES:

Students will get

CO 1: Be expertise in formulating the concentrations of tissue culture media constituents.

CO 2: capable of initiating and maintaining callus from different plant explants.

CO 3: Be skilled in animal tissue culture methods.

CO 4: Be an expert i aseptic seedling culture techniques.

CO 5: Aware of ELISA technique.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER -4
COURSE NAME: ENVIRONMENTAL AND INDUSTRIAL BIOTECHNOLOGY(Theory)
COURSE CREDITS: 4

COURSE OBJECTIVES:

To enable the students to

- Understand the role of biotechnology in Ecology
- To know the use of microbes in processing the waste water treatment
- Understand the role of Biotechnology in the environment such as Bioremediation
- Attain knowledge in Bio-fuels and microbes involved in vermiculture and Bio fertilizers.
- Know the use of microbes in industrial fermentations
- Know the use of microbes in the production of imp compounds.

COURSE OUTCOMES:

Students will get

CO 1: Acquire knowledge about the environmental pollution, types pollution, Biotrickling filters, Water pollution and management, Microbiology of waste water treatment.

CO 2: Have knowledge about Bioremediation, Bio degradation – Concepts & Principles.

CO 3: Know about bio-fuels- biogas, microbes involved in biogas production, factors affecting biogas production, Bio fertilizers and vermin culture.

CO 4: Know about the basic principles of industrial fermentation

CO 5: Attain knowledge about commercial production of microbial products.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER-4
COURSE NAME: ENVIRONMENTAL & INDUSTRIAL BIOTECHNOLOGY (Practical)
COURSE CREDITS: 1

COURSE OBJECTIVES:

To enable the students to

- Gain knowledge about purity of water.
- Know about BOD and COD of waste water.
- Understand the production of enzymes and alcohol by microorganisms.
- Understand the titrimetric analysis of citric acid.

COURSE OUTCOMES:

Students will get

CO 1: Able to determine waste water treatment.

CO 2: Able to determine Hardness and alkalinity of water.

CO 3: Able to find out Dissolved oxygen and BOD of water sample.

CO 4: Able to isolate industrially useful microbes from the soil.

CO5: Able to produce microbial products by fermentation.




PRINCIPAL
SPACES DEGREE COLLEGE
PAYAKARAOPETA

SEMESTER-5
COURSE NAME: ORGANIC FARMING (Theory)
COURSE CREDITS: 4

COURSE OUTCOMES:

- CO 1:** Understand the soil profile and nutrients present in the soil.
- CO 2:** Gain knowledge about plant nutrition and different types of fertilizers.
- CO 3:** Appreciate the importance of organic manure and bio fertilizers.
- CO 4:** Able to produce compost, farm yard compost and vermin compost.
- CO 5:** Acquire skills on isolation and maintenance of Bio fertilizers.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER- 5
COURSE NAME: ORGANIC FARMING (Practical)
COURSE CREDITS: 1

COURSE OUTCOMES:

- Co 1:** Able to estimate NPK levels of soil
- CO 2:** Develop skills on preparation of vermin compost
- CO 3:** Learn the technique of establishing organic farms
- CO 4:** Equip with the skill of preparation of microbial media
- CO 5:** Demonstrate the collection and processing raw materials.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER -5
COURSE NAME: BIOFERTILIZERS AND BIOPESTICIDE PRODUCTION (Theory)
COURSE CREDITS: 4

COURSE OUTCOMES:

CO 1: Understand the importance of bio fertilizers for sustaining agriculture.

CO 2: Appreciate the role of VAM in phosphorous solubilisation.

CO 3: Define bio pesticides in nature.

CO 4: Produce bio fertilizers and bio pesticides on large scale.

CO 5: Able to prepare inoculums for field application.




PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

SEMESTER-5
COURSE NAME: Biofertilizers and biopesticides production (practical)
Course credits:1

COURSE OUTCOMES:

CO 1: Able to prepare bacterial and fungal media

CO 2: Able to isolate and identify symbiotic and free living nitrogen fixing bacteria

CO 3: Able to isolate fungal biocontrol agents from soil.

CO 4: Develop skills for large scale production of microorganisms

CO 5: Hands on Expertise on staining techniques.


PRINCIPAL
SPACES DEGREE COLLEGE,
PAYAKARAOPETA

