SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-I
COURSE 1: INTRODUCTION TO CLASSICAL BIOLOGY

Course Outcomes:

1. Learn the principles of classification and preservation of biodiversity

2. Understand the plant anatomical, physiological and reproductive processes.

3. Knowledge on animal classification, physiology, embryonic development and their economic importance.

4. Outline the cell components, cell processes like cell division, heredity and molecular processes.

5. Comprehend the chemical principles in shaping and driving the macromolecules and life processes.

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-I
COURSE 2: INTRODUCTION TO APPLIED BIOLOGY

Learning Outcomes:

1. Learn the history, ultrastructure, diversity and importance of microorganisms.

2. Understand the structure and functions of macromolecules.

3. Knowledge on biotechnology principles and its applications in food and medicine.

4. Outline the techniques, tools and their uses in diagnosis and therapy.

5. Demonstrate the bioinformatics and statistical tools in comprehending the complex biological data

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-II
COURSE 3: ANIMAL DIVERSITY-I BIOLOGY OF NON-CHORDATES

LEARNING OBJECTIVES:

- To understand the taxonomic position of protozoa to helminthes.
- To understand the general characteristics of animals belonging to protozoa to hemichordata.
- To understand the structural organization of animal's phylum from protozoa to hemi chordata.
- To understand the origin and evolutionary relationship of different phyla fromprotozoa to hemi chordata.
- To understand the origin and evolutionary relationship of different phylum from annelids to hemichordates.

LEARNING OUTCOMES:

By the completion of the course the graduate should able to –

- Describe concept of animal kingdom classification and general characters of Protozoa
- Classify Porifera and Coelenterata with taxonomic keys
- Classify Phylum Platy & Nemathelminthes using examples, parasitic adaptation
- Describe Phylum Annelida & Arthropoda using examples and economic importance of vermicomposting & economic importance of insects.
- Describe Mollusca, Echinodermata & Hemi chordata with suitable examples in relation to the phylogeny.

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DEPARTMENT OF ZOOLOGY
SEMESTER-II
COURSE 4: CELL & MOLECULAR BIOLOGY

LEARNING OBJECTIVES:

- To understand the cell and distinguish between prokaryotic and eukaryotic cell
- To understand the role of different cell organelles in maintenance of life activities
- To acquaint the students with the concept s of cell division and cell cycle
- To acquaint student with basic concepts of molecular biology as to how characters are expressed with a coordinated functioning of replication, transcription and translation in all living beings
- To acquaint the students on the biological importance of biomolecules.

LEARNING OUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of what life is and how it functions at cellular level. This course will provide students with a deep knowledge in Cell and molecular biology by the completion of the course the graduate shall able to –

- Understand the basic unit of the living organisms and to differentiate the organisms by their cell structure.
- Describe fine structure and function of plasma membrane and different cell organelles of eukaryotic cell.
- Explain the cell cycle and bioenergetics of the cell
- Understand the central dogma of molecular biology and flow of genetic information from DNA to proteins
- Understand the gene expression phenomenon and biological importance of biomolecules.

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-III
COURSE 5: ANIMAL DIVERISTY-II BIOLOGY OF CHORDATES

LEARNING OBJECTIVES:

- To understand the animal kingdom.
- To understand the taxonomic position of Proto chordata to Mammalia.
- To understand the general characteristics of animals belonging to Fishes to Reptilians.
- To understand the body organization of Chordata.
- To understand the taxonomic position of Protherian mammals.

LEARNING OUTCOMES:

By the completion of the course the graduate should able to –

- Describe general taxonomic rules on animal classification of chordates
- Classify Proto chordata to Mammalia with taxonomic keys
- Understand Mammals with specific structural adaptations
- Understand the significance of dentition and evolutionary significance
- Understand the origin and evolutionary relationship of different phyla from Pro chordata to Mammalia.

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-III
COURSE 6: PRINCIPLES OF GENETICS

LEARNING OBJECTIVES:

- To provide the background knowledge on the history of genetics and the importance of Mendelian principles.
- To provide the required knowledge on the gene interactions
- To acquaint the students, distinguish between polygenic, sex-linked, and multiple allelic modes of inheritance and extrachromosomal inheritance.
- To understand the principles of sex determination in animals with a reference to human being, and sex-linked inheritance
- To understand the human karyotyping and the concept of pedigree analysis basics.

LEARNING OUTCOMES:

By the completion of the course the graduate should able to –

- To understand the history of genetics, gain knowledge basic terminology of genetics
- To acquire knowledge on interaction of genes, various types of inheritance patterns existing in animals with reference to non-Mendelian inheritance.
- To acquire knowledge on chromosomal inheritance
- Acquiring in-depth knowledge on various of aspects of genetics involved in sex determination,
- Acquiring in-depth knowledge on human karyotyping, pedigree analysis and chromosomal disorders concepts of proteomics and genomics.

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-III
COURSE 7: ANIMAL BIOTECHNOLOGY

LEARNING OBJECTIVES:

- To provide knowledge on animal cell and tissue culture and their preservation
- To empower students with latest biotechnology techniques like stem cell technology, genetic engineering, hybridoma technology, transgenic technology and their application in medicine and industry for the benefit of living organisms
- To explain in vitro fertilization, embryo transfer technology and other reproduction manipulation methodologies.
- To get insight in applications or recombinant DNA technology in agriculture, production of therapeutic proteins.
- To understand principles of animal culture, media preparation.

LEARNING OUTCOMES:

This course will provide students with a deep knowledge in animal biotechnology, by the completion of the course the graduate shall able to –

- Get knowledge of the Vectors and Restriction enzymes used in biotechnology
- Describe the gene delivery mechanism and PCR technique
- Acquire basic knowledge on media preparation and cell culture techniques
- Understand the manipulation of reproduction with the application of biotechnology
- Understand the applications of Biotechnology in the fields of industry and agriculture including animal cell/tissue culture, stem cell technology and genetic engineering.

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-III
COURSE 8: EVOLUTION AND ZOOGEOGRAPHY

LEARNING OBJECTIVES:

- To provide knowledge on origin of life, theories and forces of evolution
- To explore the evidences of evolution
- To Explain the theories of evolution
- To understand the role of variations and mutations in evolution of organisms
- To understand the zoogeographical distribution of animals

LEARNING OUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of what life is and how it functions at cellular level. This course will provide students with a deep knowledge in Evolution and zoo geography, by the completion of the course the graduate shall able to –

- Understand the principles and forces of evolution of life on earth, the process of evolution of new species and apply the same to develop new and advanced varieties of animals
- Explain the different evidences of evolution
- Understand the theories of evolution
- Explain the various tools for evolution
- Map the distribution of animals according to zoological realms.

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-IV
COURSE 9: EMBRYOLOGY

LEARNING OBJECTIVES:

- The objective of this course is to provide a comprehensive understanding of the concepts of early animal development.
- Students taking this course must develop a critical appreciation of methodologies specifically used to study the process of embryonic development in animals.
- In this course different concepts of animal development will be elaborated
- Students will be made familiar with different approaches that have been used to study embryology.
- Topics that will be discussed are organogenesis and regeneration.

LEARNING OUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of concepts of embryology. This course will provide students with a deep knowledge in embryology by the completion of the course the graduate shall able to –

- Understand the historical perspective and concepts of embryology
- Acquire knowledge on gametogenesis, fertilization and cleavage patterns
- Understand the fate of germinal layers and extraembryonic membranes
- Explain the process of regeneration in certain animals
- Examine the process of organogenesis.

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-IV
COURSE 10: ANIMAL PHYSIOLOGY: LIFE SUSTAINING SYSTEMS

LEARNING OBJECTIVES:

- To acquire knowledge of organ systems function.
- To develop the ability to integrate physiology from the cellular and molecular level to the organ system and organismic level of organization.
- To Effectively read, evaluate and communicate scientific information related to physiological processes in the body.
- To gain a deep knowledge of current topics in physiology.

LEARNING OUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of concepts of Physiology. This course will provide students with a deep knowledge in physiology by the completion of the course the graduate shall able to –

- Understand the physiology of digestion and hormonal control of digestion
- Develop a comprehensive picture of respiratory physiology
- Acquire knowledge on the Renal physiology
- Understand the physiology of Nerve and muscle
- Understand the physiology of heart.

SPACES DEGREE COLLEGE, PAYAKARAOPETA
DEPARTMENT OF ZOOLOGY
SEMESTER-IV
COURSE 11: IMMUNOLOGY

LEARNING OBJECTIVES:

- To promote critical thinking among students.
- To provide students with a foundation in immunological processes
- To provide students with knowledge on how the immune system works building on their previous knowledge
- To clearly state the role of the immune system.
- To compare and contrast the innate versus adaptive immune systems.
- To provide an overview of the interaction between the immune system and pathogens.

LEARNING OUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of concepts of immunology. This course will provide students with a deep knowledge in immunology by the completion of the course the graduate shall able to –

- Articulate the roles of innate recognition receptors in immune responses
- Compare and contrast humoral versus cell-mediated immune responses
- Distinguish various cell types involved in immune responses and associated functions;
- Distinguish and characterize antibody isotypes, development, and functions
- Understand the role of cytokines in immunity and immune cell activation;
- Understand the significance the Major Histocompatibility Complex in terms of immune response and transplantation.

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