ANDHRA LOYOLA COLLEGE(AUTONOMOUS) VIJAYAWADA
B.Sc ZOOLOGY SYLLABUS UNDER CBCS(w.e.f 2023-24]
I B.Sc ZOOLOGY Semester-I

COURSE 1: INTRODUCTION TO CLASSICAL BIOLOGY

Theory Credits: 4 5 hrs/week

Learning objectives

The student will be able to learn the diversity and classification of living organisms and understand their chemical, cytological, evolutionary and genetic principles.

Learning 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.

SYLLABUS

Unit 1: Introduction to systematics, taxonomy and ecology.

1.1. Systematics – Definition and concept, Taxonomy – Definition and hierarchy.

1.2. Nomenclature – ICBN and ICZN, Binomial and trinomial nomenclature.

1.3. Ecology – Concept of ecosystem, Biodiversity and conservation.

1.4. Pollution and climate change.

Unit 2: Essentials of Botany.

2.1. The classification of plant kingdom.

2.2. Plant physiological processes (Photosynthesis, Respiration, Transpiration, phytohormones).

2.3. Structure of flower – Micro and macro sporogenesis, pollination, fertilization and structure of mono and dicot embryos.

2.4 Mushroom cultivation, floriculture and landscaping.
Unit 3: Essentials of Zoology

3.1. The classification of Kingdom Animalia and Chordata.

3.2 Animal Physiology – Basics of Organ Systems & their functions, Hormones and Disorders

3.3 Developmental Biology – Basic process of development (Gametogenesis, Fertilization, Cleavage and Organogenesis)

3.4 Economic Zoology – Sericulture, Apiculture, Aquaculture

Unit 4: Cell biology, Genetics and Evolution

4.1. Cell theory, Ultrastructure of prokaryotic and eukaryotic cell, cell cycle.

4.2. Chromosomes and heredity – Structure of chromosomes, concept of gene.

4.3. Central Dogma of Molecular Biology.

4.4. Origin of life

Unit 5: Essentials of chemistry

5.1. Definition and scope of chemistry, applications of chemistry in daily life.

5.2. Branches of chemistry

5.3. Chemical bonds – ionic, covalent, noncovalent – Vander Waals, hydrophobic, hydrogen bonds.

5.4. Green chemistry

References

1. Sharma O.P., 1993. Plant taxonomy. 2nd Edition. McGraw Hill publishers.

2. Pandey B.P., 2001. The textbook of botany Angiosperms. 4th edition. S. Chand publishers, New Delhi, India.

3. Jordan E.L., Verma P.S., 2018. Chordate Zoology. S. Chand publishers, New Delhi, India.

4. Rastogi, S.C., 2019. Essentials of animal physiology. 4th Edition. New Age International Publishers.

5. Verma P.S., Agarwal V.K., 2006. Cell biology, genetics, Molecular Biology, Evolution and Ecology. S. Chand publishers, New Delhi, India.

6. Sathyanarayana U., Chakrapani, U., 2013. Biochemistry. 4th Edition. Elsevier publishers.

7. Jain J.L., Sunjay Jain, Nitin Jain, 2000. Fundamentals of Biochemistry. S. Chand publishers, New Delhi, India.

8. Karen Timberlake, William Timberlake, 2019. Basic chemistry. 5th Edition. Pearson publishers.

9. Subrata Sen Gupta, 2014. Organic chemistry. 1st Edition. Oxford publishers. ACTIVITIES:

1. Make a display chart of life cycle of nonflowering plants.
2. Make a display chart of life cycle of flowering plants.
3. Study of stomata
4. Activity to prove that chlorophyll is essential for photosynthesis
5. Study of pollen grains.
6. Observation of pollen germination.
7. Ikebana.
8. Differentiate between edible and poisonous mushrooms.
9. Visit a nearby mushroom cultivation unit and know the economics of mushroom cultivation.
10. Draw the Ultrastructure of Prokaryotic and Eukaryotic Cell
11. Visit to Zoology Lab and observe different types of preservation of specimens
12. Hands-on experience of various equipment – Microscopes, Centrifuge, pH Meter, Electronic Weighing Balance, Laminar Air Flow
13. Visit to Zoo / Sericulture / Apiculture / Aquaculture unit
14. List out different hormonal, genetic and physiological disorders from the society

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I B.Sc ZOOLOGY SEMESTER-I

COURSE 2: INTRODUCTION TO APPLIED BIOLOGY

Theory Credits: 4 5 hrs/week

Learning objectives

The student will be able to learn the foundations and principles of microbiology, immunology, biochemistry, biotechnology, analytical tools, quantitative methods, and bioinformatics.

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.

Unit 1: Essentials of Microbiology and Immunology

1.1. History and Major Milestones of Microbiology; Contributions of Edward Jenner, Louis Pasteur, Robert Koch and Joseph Lister.

1.2. Groups of Microorganisms – Structure and characteristics of Bacteria, Fungi, Archaea and Virus.

1.3. Applications of microorganisms in – Food, Agriculture, Environment, and Industry.

1.4. Immune system – Immunity, types of immunity, cells and organs of immune system.

Unit 2: Essentials of Biochemistry

2.1. Biomolecules I – Carbohydrates, Lipids.

2.2. Biomolecules II – Amino acids & Proteins.

2.3. Biomolecules III – Nucleic acids -DNA and RNA.

2.4. Basics of Metabolism – Anabolism and catabolism.

Unit 3: Essentials of Biotechnology

3.1. History, scope, and significance of biotechnology. Applications of biotechnology in Plant, Animal, Industrial and Pharmaceutical sciences.

3.2. Environmental Biotechnology – Bioremediation and Biofuels, Biofertilizers and Biopesticides.

3.3. Genetic engineering – Gene manipulation using restriction enzymes and cloning vectors; Physical, chemical, and biological methods of gene transfer.

3.4. Transgenic plants – Stress tolerant plants (biotic stress – BT cotton, abiotic stress – salt tolerance). Transgenic animals – Animal and disease models.

Unit 4: Analytical Tools and techniques in biology – Applications

4.1. Applications in forensics – PCR and DNA fingerprinting

4.2. Immunological techniques – Immunoblotting and ELISA.

4.3. Monoclonal antibodies – Applications in diagnosis and therapy.

4.4. Eugenics and Gene therapy

Unit 5: Biostatistics and Bioinformatics

5.1. Data collection and sampling. Measures of central tendency – Mean, Median, Mode.

5.2. Measures of dispersion – range, standard deviation and variance. Probability and tests of significance.

5.3. Introduction, Genomics, Proteomics, types of Biological data, biological databases- NCBI, EBI, Gen Bank; Protein 3D structures, Sequence alignment

5.4. Accessing Nucleic Acid and Protein databases, NCBI Genome Workbench

REFERENCES

1. Gerard J., Tortora, Berdell R. Funke, Christine L. Case., 2016. Microbiology: An Introduction. 11th Edition. Pearson publications, London, England.

2. Micale, J. Pelczar Jr., E.C.S. Chan., Noel R. Kraig., 2002. Pelczar Microbiology. 5th Edition. McGraw Education, New York, USA.

3. Sathyanarayana U., Chakrapani, U., 2013. Biochemistry. 4th Edition. Elsevier publishers.

4. Jain J.L., Sunjay Jain, Nitin Jain, 2000. Fundamentals of Biochemistry. S. Chand publishers, New Delhi, India.

5. R.C. Dubey, 2014. Advanced Biotechnology. S. Chand Publishers, New Delhi, India.

6. Colin Ratledge, Bjorn, Kristiansen, 2008. Basic Biotechnology. 3rd Edition. Cambridge Publishers.

7. U. Sathyanarayana, 2005. Biotechnology. 1st Edition. Books and Allied Publishers pvt. ltd., Kolkata.

8. Upadhyay, Upadhyay and Nath. 2016. Biophysical Chemistry, Principles and Techniques. Himalaya Publishing House.

9. Arthur M. Lesk. Introduction to Bioinformatics. 5th Edition. Oxford publishers.

10. AP Kulkarni, 2020. Basics of Biostatistics. 2nd Edition. CBS publishers.

ACTIVITIES

1. Identification of given organism as harmful or beneficial.
2. Observation of microorganisms from house dust under microscope.
3. Finding microorganism from pond water.
4. Visit to a microbiology industry or biotech company.
5. Visit to a waste water treatment plant.
6. Retrieving a DNA or protein sequence of a gene’

7. Performing a BLAST analysis for DNA and protein.
8. Problems on biostatistics.
9. Field trip and awareness programs on environmental pollution by different types of wastesand hazardous materials.
10. Demonstration on basic biotechnology lab equipment.
11. Preparation of 3D models of genetic engineering techniques.
12. Preparation of 3D models of transgenic plants and animals.

B.Sc ZOOLOGY SYLLABUS UNDER CBCS [w.e.f 2021-22]
II B.Sc ZOOLOGY Semester-III

Paper – III: Cell Biology, Genetics, Molecular Biology and Evolution

4 Hrs/W **60 Hrs/Sem** **Credits-4**

Course Code:ZOOCGME233(T)

Course Outcomes: By successful completion of the course, students will be able to;

1. Describe structure and functions of cell and cell organelles and to differentiate the organisms by their cell structure.
2. Understand what life is and how it functions at cellular level.
3. Have knowledge of history of origin of genetics, heredity, interaction of genes, inheritance patterns existing.
4. be acquainted with various aspects of genetics involved in sex determination, human karyotyping and chromosomal aberrations
5. gain knowledge about the central dogma of molecular biology and flow of genetic information from DNA to proteins.
6. Understand the principles, forces and process of evolution of life and new species on the planet earth.

SYLLABUS

Unit – I Cell Biology

1.1 Definition, Prokaryotic and Eukaryotic cells, Virus, Viroids, Mycoplasma

1.2 Electron microscopic structure of Animal cell.

1.3 Plasma membrane –Models and transport functions of Plasma membrane.

1.4 Structure and functions of Golgi complex, Endoplasmic Reticulum, Lysosomes

1.5 Mitochondria. and Chromosomes

(Note: 1. General pattern of study of each cell organelle – Discovery, Occurrence, Number, Origin, Structure and Functions with suitable diagrams**)**

1. Need not study cellular respiration under mitochondrial functions)

Unit – II: Genetics - I

2. 1 Mendel's work on transmission of traits, Mendel's Laws of Inheritance

2. 2 Gene Interaction – Incomplete Dominance, Codominance, Lethal Genes

2. 3 Polygenes (General Characteristics & examples); Multiple Alleles

(General Characteristics and Blood group inheritance

2. 4 Sex determination (Chromosomal, Genic balance, overview of Hormonal, Environmental and Haplo-diploidy types of sex determination)

Unit – III: Genetics – I

3.1 Mutations & Mutagenesis

3.2 Chromosomal Disorders (Autosomal and Allosomal)

3.3 Human Genetics – Karyotyping, Pedigree Analysis (basics)

UNIT IV: Molecular Biology

4.1 Central Dogma of Molecular Biology, Basic concepts of - DNA replication – (Semi-conservative mechanism,)

4.2 Transcription in prokaryotes – Initiation, Elongation and Termination,

4.3 Translation – Initiation, Elongation and Termination

4.4 Gene Expression in prokaryotes (Lac Operon)

Unit – V Origin of life

5.1 Origin of Life

5.2 Theories of Evolution: Lamarckism, Darwinism, Germplasm theory, Mutation theory

5.3 Neo-Darwinism: Modern Synthetic theory of Evolution, Hardy-Weinberg Equilibrium

5.4 Forces of Evolution: Isolating mechanisms, Genetic Drift, Natural Selection.

ANDHRA LOYOLA COLLEGE (AUTONOMOUS) VIJAYAWADA
B.Sc ZOOLOGY SYLLABUS UNDER CBCS [w.e.f 2022-23]
III B.Sc ZOOLOGY Semester-V

Course6 B: LIVE STOCK MANAGEMENT-I (BIOLOGY OF DAIRY ANIMALS)

3 Hrs/W **60 Hrs/Sem** **Credits-3**

Course Code: ZOOLSMBDA356B(T)

I. Learning Outcomes:

• Students at the successful completion of the course will be able to

• Select the suitable breeds of livestock for rearing

• Relate the anatomy of udder with letdown of milk

• Identify and manipulate the reproductive behavior of cattle

• Inspect the economics of dairy farming

• Apprise the various breeding techniques employed in livestock.

SYLLABUS

Unit 1:

Livestock census; Scope and status of dairy industry in INDIA

Breeds of Dairy cattle, Buffaloes

Indigenous, Exotic and Crossbred Cattle breeds

Unit 2:

Anatomy of Udder; Development of udder or Mammogenesis; Lactogenesis and Galactopoises; Letdown of milk.

Unit 3:

IVF, Artificial insemination; Oestrous cycle; Symptoms of heat in cows and buffaloes. Conception, Pregnancy diagnosis in cattle. Multi ovulation and embryo transfer technique.

Unit4:

Economic traits of Dairy cattle.

Methods of selection of dairy animals.

Judging of dairy cattle, Determination of age in dairy cattle (Records of dentition)

Unit5:

Systems of Dairy cattle breeding. Inbreeding, outbreeding, Cross breeding, Grading up.

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III B.Sc ZOOLOGY Semester-V PAPER-7B

TITLE: LIVE STOCK MANAGEMENT -II

(DAIRY PRODUCTION AND MANAGEMENT)

3 Hrs/W **60 Hrs/Sem** **Credits-3**

Course Code: ZOOLSMDPM357B(T)

Course Outcomes:

Students at the successful completion of the course will be able to

- Identify and suggest the suitable housing system for the dairy farming
- Understand management practices for the dairy farming
- Learn the process of milk pasteurization • Prepare cream from milk

SYLLABUS

Unit1:

Systems of Housing of Dairy cattle- Loose Housing, Free stall houses and Conventional Dairy Barns. Drawing of layouts for dairy cattle dwellings; Criteria for selecting site for establishing Dairy farm buildings; Water Quality and requirement of dairy animals. Cleaning of the dairy house.

Unit2:

Management of different classes of Dairy animals- Milk producing animals, pregnant animals dry animals, heifers and calves. Management practices for Dairy farm; Restraining, Identification, Dehorning, Castration, Deworming, Vaccination, and Milking.

Unit 3:

(a) Pasteurization of milk: Definition, objects of pasteurization, objections to pasteurization, Principles of heat exchange. Methods of pasteurization: LTLT, HTST, UHT and Uperization.
(b). Homogenization

Unit 4:

Market milk: Characteristics of different types of milk–Toned milk, double toned milk, Reconstituted milk, Standardized milk and full cream milk. Sterilization of milk

Unit 5:

Cream: Types of cream, composition, methods of cream separation, gravity and centrifugal methods, types of cream separators, factors affecting fat losses in skim milk and fat percentage in cream.

(FOR FOURTH YEAR COURSE)

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B.Sc ZOOLOGY SYLLABUS UNDER CBCS [w.e.f 2023-24]
III B.Sc ZOOLOGY Semester-VII PAPER-8A

TITLE: ENDOCRINOLOGY

3 Hrs/W **60 Hrs/Sem** **Credits-3**

I. Learning Outcomes:

This course will provide students with a deep knowledge in endocrinology by the successful completion of the course the graduate shall able to –

- Acquire a comprehensive picture of scope in endocrinology and morphology of endocrine tissues
- Know the synthesis release of hormones and functions
- Understand the mechanism of hormone action
- Understand the the interrelationship between endocrine and nervous system
- Understand the hormone regulation mechanism

II. Syllabus:

Unit 1

1.1Aim and scope of endocrinology,Types of chemical messengers, Discovery of hormones, Classification of endocrine glands and hormones.

1.2 Comparative morphology of Endocrine tissue-Hypothalamus, Gastrointestinal tract, Juxta-glomerular apparatus (kidney), Heart.

Unit 2

2.1 Life history of hormones: Biosynthesis of hormones- Biosynthesis of simple peptide hormone, Biosynthesis of amino acid derived small size hormone (T3, T4), Biosynthesis of steroid hormone, (cortisol, progesterone)

2.2 Release of hormone from endocrine gland-Releasing mechanism.

2.3Concentration and transport of hormone in the blood

Unit 3

3.1 General mechanism of hormone action - Feedback mechanism.

3.2 Plasma membrane hormone receptor and its action,

Cytosolic hormone receptor and its action,

3.3 Termination of hormone action.

Unit 4

4.1 Neuroendocrine system - The hypothalamic- hypophyseal axis. Hypothalamo- vascular system.

4.2 Hormones from hypothalamus: Physiology of releasing and release inhibiting hormones;

4.3 Regulation of hypothalamic hormone secretion

Unit-5

5.1 Hormonal regulation and its metabolic activity- Role of hormones in – Carbohydrate metabolism, Protein metabolism, Fat metabolism.

5.2 Role of hormone in fasting, Hormone & behavior, Role of hormone in growth & development

III. Recommended Text books

1. General & comparative endocrinology: E.J.W. Barrington, oxford, Clarendon Press
2. Textbook of Endocrinology: R.H. Williams, W.B Saunders
3. Endocrinology: Hadley
4. Endocrinology: Negi

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III B.Sc ZOOLOGY Semester-VII PAPER-8A

ENDOCRINOLOGY LAB

Hours : 30 **Max. Marks: 50**

I Learning Out comes

- This course will provide students with a deep knowledge in acquiring laboratory skills, by completion of the course the graduate shall able to –
- · Acquire a skill to demonstrate the endocrine glands of model animals
- · Know the anatomy of endocrine glands
- · Understand the mechanism of hormone action
- · Understand the interrelationship between endocrine and nervous system
- · Understand the hormone regulation mechanism

○ II. Syllabus

- 1. Demonstration of various endocrine glands in fish/fowl
- 2. Endocrine glands Morphology and Anatomy:
- Whole gland morphology, T.S/L. S to be explained with model or slide)
    - A. Pituitary gland
    - B. Pancreas,
    - C. Thyroid,
    - D. Parathyroid,
    - E. Thymus,
    - F. Adrenal gland,
    - G. Testis,
    - H. Ovary.
- 3. Hormone assay protocols/virtual lab/Video - T3, T4, TSH (Any commercial kit)
- 4. Survey on the thyroid patients in the college/Community – Preparation of the Report with observation and specific comments (Details from clinical laboratories nearby PHC's may obtained by visits) 6 Hours
- 5. Optional- Demonstration/Virtual lab demo/video of synthetic hormone ova prim/ova tide on any model animal. (fish)

■ III. Web resources for Laboratory

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- · https://www.cdc.gov/nchs/data/nhanes/nhanes_01_02/l18t4_b_met_b_tsh.pdf
- https://www.redlandsusd.net/site/handlers/filedownload.ashx?moduleinstanceid=1987 2&dataid=19726&FileName=Endocrine%20System%20Rat%20Lab.pdf https://www.healthline.com/health/thyroid-function-tests#What-are-thyroid-function- tests
- · https://pixabay.com/images/search/endocrine/

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B.Sc ZOOLOGY SYLLABUS UNDER CBCS [w.e.f 2023-24]
III B.Sc ZOOLOGY Semester-VII PAPER-8B

TITLE: DEVELOPMENTAL BIOLOGY AND REPRODUCTIVE TECHNOLOGIES

Hours- 60 **Max. Marks-100**

I. Learning Outcomes:

This course will provide students with a deep knowledge in Developmental biology by the successful completion of the course the graduate shall able to –

· Acquire knowledge on the Developmental Biology

· Know the composition and biochemistry of semen

· Understand the growth and differentiation of ovarian follicle

· Understand the Biochemistry of Fertilization

· Understand the Assisted reproduction technologies

· Understand Immuno contraception

Syllabus
Unit – 1 :

1.1 Heterogamy in eukaryotes

1.2 Comparative account of differentiation of gonads in a mammal and any one invertebrate

1.3 Biochemistry of semen

1.3.1 Semen composition and formation

1.3.2 Assessment of sperm functions

Unit – 2:**Ovarian follicular growth and differentiation**

2.1Morphology

2.2 Endocrinology

2.3 Previtellogenesis and a brief note on Genes involved in ovary formation and development

2.4 Vitellogenesis

2.5 Ovulation and ovum transport in mammals

Unit-3 Fertilization

3.1 Pre-fertilization

3.2 Biochemistry of fertilization

3.3 Post-fertilization

3.4 Collection and cryopreservation of gametes and embryos

Unit –4: Assisted reproduction technologies

4.1 Embryo sexing -pros and cons

4.2 Screening for genetic disorders - US scan, Amniocentesis, Cordocentesis, CVS

4.3 ICSI, GIFT etc.

4.4 Cloning of animals by nuclear transfer

Unit –5 : Immunocontraception

5.1 Gamete specific antigens

5.2 Surgical methods

5.3 Hormonal methods

5.4 Physical methods

5.5 IUCD

III. Recommended Text books

1. Textbook of Human Development" by Rani K Sudha and Srivastava Sushila
2. Developmental Biology (Developmental Biology Developmental Biology)" by Scott F Gilbert and Susan R Singer

DEVELOPMENTAL BIOLOGY AND REPRODUCTIVE TECHNOLOGIES (lab)

Periods: 30 **Max. Marks: 50**

I. Learning Out comes

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

- Acquire a skill to observe the different embryonic developmental stages
- Know the basic embryonic development of chick
- Know the protocol of pregnancy test with kits

II. Lab Syllabus:

1. Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages)
2. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages)
3. Study of different sections of placenta (photomicrograph/ slides)
4. Types of eggs
5. Testis Section Human
6. Ovary Section Human
7. Mounting spermatozoa – Grasshopper/Frog/Chick/Rat
8. Demonstration: Pregnancy test using commercial kit

Web resources for Lab Work:

- https://www.youtube.com/watch?v=4Y9jiwOWlHA- Chick Lab
- https://www.youtube.com/watch?v=-Oay7q_xw9U
- https://www.youtube.com/watch?v=25nyZd7gbj4

https://virtuallabs.merlot.org/vl_biology.html#blol

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B.Sc ZOOLOGY SYLLABUS UNDER CBCS [w.e.f 2023-24]
III B.Sc ZOOLOGY Semester-VII PAPER-8B
TITLE: HUMAN HEALTH AND INFECTIOUS DISEASES

Hours- 60 **Max. Marks-100**

I. Learning Outcomes

While studying the Human Health and Infectious Diseases course, the student shall be able to:

- Introduce the basic concepts of pathophysiology of infectious diseases
- Study the major infectious diseases transmission to humans and response of immunity
- Understand the Pathogenesis, mechanisms of pathogenesis; transmission and epidemiology of various bacterial, viral, fungal and protozoan diseases.
- Study the Sexually transmitted diseases.
- Study the prevention and control measures of infectious diseases

II. Syllabus

Unit-1.

1.1 Introduction to Infectious Diseases:

1.2 Basic concepts in pathophysiology of infectious diseases

1.3 Outline of physiological mechanisms leading to diseased state, Infectious disease transmission, Infection and immunity, Acute and Chronic Infections Major infectious diseases of humans.

Unit-2. Bacterial Infections:

2.1-**Tuberculosis-** Pathogenesis, mechanisms of pathogenesis; transmission, epidemiology, public health implications, diagnosis, prophylaxis and treatment of major human infections

2.2 **Cholera-** Pathogenesis, mechanisms of pathogenesis; transmission, epidemiology, public health implications, diagnosis, prophylaxis and treatment of major human infections-

2.3 - **Typhoid-** Pathogenesis, mechanisms of pathogenesis; transmission, epidemiology, public health implications, diagnosis, prophylaxis and treatment of major human infections.

Unit-3. Viral Diseases:

3.1 Pathogenesis, mechanisms of pathogenesis; transmission, epidemiology, public health implications, diagnosis, prophylaxis and anti-retroviral therapy of Human immunodeficiency virus (HIV/AIDS)

3.2 Pathogenesis, mechanisms of pathogenesis; transmission, epidemiology, public health implications, diagnosis, prophylaxis and anti-retroviral therapy of Sexually transmitted diseases

Unit-4. Fungal Diseases:

4.1 Pathogenesis, mechanisms of pathogenesis; transmission, life cycle, epidemiology, public health implications, diagnosis, prophylaxis and treatment of major Fungal human pathogens- Dermaldyplasia

4.2 Pathogenesis, mechanisms of pathogenesis; transmission, life cycle, epidemiology, public health implications, diagnosis, prophylaxis and treatment of major Fungal human pathogens: - Candiasis

Pathogenesis, mechanisms of pathogenesis; transmission, life cycle, epidemiology, public health implications, diagnosis, prophylaxis and treatment of major Fungal human pathogens: - Aspergillosis.

Unit-5. Protozoan Diseases

5.1 Pathogenesis, mechanisms of pathogenesis; transmission, life cycle, epidemiology, public health implications, diagnosis, prophylaxis and treatment of Protozoan human pathogen- *Trypanosoma.*

5.2 Pathogenesis, mechanisms of pathogenesis; transmission, life cycle, epidemiology, public health implications, diagnosis, prophylaxis and treatment of Protozoan human pathogen- *Giardia intestinalis*.

5.3 Pathogenesis, mechanisms of pathogenesis; transmission, life cycle, epidemiology, public health implications, diagnosis, prophylaxis and treatment of Protozoan human pathogen- *Leishmania* donovani.

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B.Sc ZOOLOGY SYLLABUS UNDER CBCS [w.e.f 2023-24]

III B.Sc ZOOLOGY Semester-VII PAPER-10A

SKILL ENHANCEMENT COURSES

MILK AND MILK PRODUCTS TECHNOLOGY

Hours- 60 Max. Marks-100

LEARNING OUTCOMES

By the successful completion of the course the graduate shall able to –

Understand the basics of milk and milk products

Know the composition, processing, and packaging of milk and milk products

Understand the reasons for deterioration of milk and milk products

Understand the process in preparation of different milk products

Gain knowledge about different organic milk products

Understanding the regulations and standards related to milk and milk products.

SYLLABUS

UNIT-1:

1.1 Definition of milk and milk products

1.2 Composition of milk and factors affecting composition

1.3 Nutritional value of milk and milk products

1.4 Types of milk products

UNIT-2:

2.1 Procurement and transportation of milk

2.2 Processing of milk

(Chilling, standardization, pasteurization, UHT treatment, homogenization, bactofugation)

UNIT-3

3.1 Packaging, storage and distribution of milk and milk products.

3.2 Microbiological deterioration of milk and milk products.

3.3 Common defects of milk products- curd, butter,,

paneer, ghee, cream, khoa and their remedial measures.

UNIT-4:

4.1 Preparation of cream, butter, paneer or channa, ghee,

4.2 Preparation of khoa, lassi, dahi, ice-cream, mozzarella

4.3 Preparation of cheese, Yogurt, Butter

UNIT-5:

5.1 Organic milk products.

5.2 Pesticides residues in milk Legal and BIS standards of milk and milk products

REFERENCE BOOKS

Dairy Processing and Quality Assurance by Ramesh C. Chandan, Arun Kilara, and Nagendra Shah

Principles of Dairy Science by W.J. Hurst, R.W. Griffiths, and T.P. Toulouse

Dairy Processing: Improving Quality by M. K. Hailu and G. K. Kebede

Dairy Plant Engineering and Management by Tufail Ahmad and N.P. Pandey

Dairy Microbiology by Marth and Steele

Milk and Milk Products Technology by Sunita Mann and Y.C. Gupta

Milk Processing and Milk Products Handbook by NPCS Board of Consultants & Engineers

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PRACTICAL COURSE – 10A

MILK AND MILK PRODUCTS TECHNOLOGY

Hours-30 Max. Marks- P50

LEARNING OUTCOMES

By the successful completion of the course the graduate shall able to –

Develop skill in estimation of fat content in milk

Develop skill in estimation of SNF content in milk

Gain knowledge about various platform tests at milk reception sites

Develop practical skills in milk testing, quality control and assurance

Develop practical skills in determination of specific gravity of milk

Develop practical skills in analysis of butter and cream content.

PRACTICAL SYLLABUS

Estimation of Fat Content in milk

Estimation of SNF Content in Milk

Various Platform Tests at milk reception sites

Tests For Adulteration in Milk

Determination of Specific Gravity by Lactometer

Analysis of Butter by Khoman Method

Estimation of Fat in Cream by Fat Method

Estimation of Acidity in Cream

LAB REFERENCE BOOKS

Dairy Processing and Quality Assurance by Ramesh C. Chandan, Arun Kilara, and Nagendra Shah

Practical Manual for Quality Assurance in Milk and Milk Products by M.S. Grewal and S. Chavan

Manual of Methods of Analysis of Milk and Milk Products by BIS (Bureau of Indian Standards)

Dairy Plant Management and Pollution Control by S. Ranganathan and K.K. Srivastava

CO-CURRICULAR ACTIVITIES

ANDHRA LOYOLA COLLEGE (AUTONOMOUS) VIJAYAWADA

B.Sc ZOOLOGY SYLLABUS UNDER CBCS [w.e.f 2023-24]

III B.Sc ZOOLOGY Semester-VII PAPER-10B

SKILL ENHANCEMENT COURSES

MILK AND MEAT HYGIENE, FOOD SAFETY AND PUBLIC HEALTH

Hours- 60 Max. Marks-100

LEARNING OUTCOMES

By the successful completion of the course the graduate shall able to –

Understand the importance of Milk and Meat Hygiene in public health

Identify sources of milk and meat contamination

Describe methods for milk and meat quality control and inspection

Identify and control milk and meat-borne pathogens

Understand about hazards of milk and meat

Understand food safety regulations and laws

Implement HACCP principles in food safety evaluation

Evaluate food preservation techniques

SYLLABUS

UNIT-1: INTRODUCTION OF MILK AND MEAT HYGIENE

1.1 Definition and scope of Milk and Meat Hygiene

1.2. Public health aspects of Milk and Meat Hygiene

UNIT-2: MILK HYGIENE

2.1 Sources of milk contamination

2.2 Pasteurization and sterilization of milk

2.3 Common Milk-borne diseases

2.4 Milk quality control and inspection

UNIT-3: MEAT HYGIENE

3.1 Sources of meat contamination

3.2 Slaughtering and dressing of animals

3.3 Common Meat-borne diseases

3.4 Meat quality control and inspection

UNIT-4: HAZARDS FOR MILK AND MEAT

4.1 Microbial toxicities associated with milk, meat and aquatic foods.

4.2 Toxic residues: pesticides, antibiotics, metals and hormones in food and their health hazards.

4.3 Microbial toxins in food and their health hazards.

4.4 Sanitary and phytosanitary measures in relation to foods of animal origin and aquatic foods.

UNIT-5: FOOD SAFETY AND PUBLIC HEALTH

5.1 Hazard Analysis and Critical Control Points (HACCP)

5.2 Food safety regulations and laws

5.3 Food preservation techniques

REFERENCE BOOKS

Food Safety: Principles and Practices by Ronald Schmidt and Gary Rodrick

Food Safety and Quality Systems in Developing Countries, Volume One: Export Challenges and Implementation Strategies by Jeffrey Hoorfar, Sibel Roller, and Jorgen Schlundt

Meat Hygiene by K. Singh and R. K. Sharma

Milk and Dairy Products: Technology, Chemistry and Microbiology by Nivedita Datta and Dattatreya Mukhopadhyay

Handbook of Food Safety Engineering by Da-Wen Sun

Food Safety and Toxicity by Debasis Bagchi and Sreejayan Nair

Handbook of Food Preservation by M. Shafiur Rahman

Food Safety: The Science of Keeping Food Safe by Ian C. Shaw

Milk Processing and Quality Management edited by Adnan Y. Tamime

Meat Hygiene by J.F. Gracey, D.S. Collins, and R.J. Huey

Handbook of Food Science, Technology, and Engineering edited by Y.H. Hui

Principles of Food Sanitation by Norman G. Marriott and Robert B. Gravani

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PRACTICAL PAPER – 10B

MILK AND MEAT HYGIENE, FOOD SAFETY AND PUBLIC HEALTH

Hours- 30 Max. Marks-50

LEARNING OUTCOMES

Demonstrate skills Microbiological analysis of raw milk and meat samples

Skill in grading of milk by MBR test process

Skill development in Ante-mortem inspection of food animals.

Skill development in Post mortem inspection of food animals.

Understand Food safety and hygiene practices among consumers, food handlers, and food processors.

SYLLABUS

Microbiological examination of raw milk and meat samples

Grading of milk by MBR test.

Ante-mortem inspection of food animals.

Post mortem inspection of food animals.

Food safety and hygiene practices among consumers, food handlers, and food processors.

Study the role of the Andhra Pradesh Public Health and Municipal Engineering Department (PHMED) in food safety and hygiene

REFERENCE BOOKS

Practical Meat Hygiene by J. J. Vogel and S. G. Tindall

Practical Dairy Chemistry: Methods of Analysis by T. Varadarajan and B. S. Narang

Food Safety and Quality Management: A Practical Approach by Hal King and Joyce Igoe

Meat Processing Technology: For Small- to Medium-Scale Producers by Fidel Toldrá and Leo M.L. Nollet

Dairy Processing Handbook by Tetra Pak Processing Systems AB

Food Microbiology: Fundamentals and Frontiers by Michael Doyle and Robert Buchanan

CO-CURRICULAR ACTIVITIES

Visit to local dairy and meat processing facilities

Guest lectures by industry professionals and government regulators

Research and presentation on a specific food safety issue or outbreak

Food safety training for local community members or organizations

Participation in food safety competitions or events.

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ANDHRA LOYOLA COLLEGE (AUTONOMOUS), VIJAYAWADA-8
Zoology Semester-II Skill Development Course
TITLE: POULTRY FARMING [w.e.f 2021-22]

Total: 30hrs (02h/wk) 02 Credits Max 50Marks

Course Outcomes:

By successful completion of the course, students will be able to;

1.Understand the poultry scenario in India, and various poultry systems, poultry farming.
2.Have knowledge of management of broilers, growers, chicks and also about banking insurance.
3. know about feed management, various diseases occur in the poultry industry and their management and also about product harvesting.

SYLLABUS:

UNIT I - Introduction to Poultry Farming: **06Hrs**

1.1 General introduction to poultry farming -Definition of Poultry; Past and present scenario of poultry industry in India.
1.2 Principles of poultry housing. Poultry houses.
1.3 Systems of poultry farming.

UNIT II – Poultry Management: **06 Hrs**

1. Management of chicks, growers and layers.
2.2 Management of Broilers.
2.3 Preparation of project report for banking and insurance

UNIT III– Poultry Feed Management: **06 Hrs**

1. Poultry feed management – Principles of feeding,
2. Nutrient requirements for different stages of layers and broilers.
3. Feed formulation and Methods of feeding.

UNIT IV – Poultry Diseases and Sanitation: **05 Hrs**

4.1 Poultry diseases – viral, bacterial, fungal and parasitic(two each); symptoms, control and management; Vaccination programme.
4.2 Farm and Water Hygiene, Recycling of poultry waste.

UNITV- Harvesting of Eggs:_____07 Hrs

1. Selection, care and handling of hatching eggs. Egg testing.Methods of hatching.
2. Brooding and rearing. Sexing of chicks.

Co-curricular Activities Suggested: (4 hrs)

1. Group discussion & SWOT analysis
2. Visit to a poultry farm
3. Invited Lectures by Concerned officers of government or private farms
4. Cheap and Healthy Feed preparation by students based on government standards
5. Market study and Survey (Monitoring of daily price hike in poultry market and analysis)
6. Online SwayamMoocs course on poultry farming (see reference 9 below)

REVISED CBCS W.E.F 2021-2022
ANDHRA LOYOLA COLLEGE (AUTONOMOUS), VIJAYAWADA-8
SEMESTER-III LIFE SKILL COURSE
TITLE: Health and Hygiene

Total: 30hrs (02h/wk) **02 Credits & Max 50Marks**

(SYLLABUS)

Course Outcomes: On completion of this course, the students will be able to understand -

- What is a healthy diet and how nutritious diet is used for healthy life.
- How can we use available information to optimize our diet?
- The importance of health and hygiene in life
- The importance of nutrition for a healthy life
- different health care programs of India
- basic concept of health impact assessment as a means of assessing the policies, plans and projects using quantitative and qualitative techniques
- importance of community and personal health & hygiene measures
- Importance of food, social tenets, mental condition, physical activity on health

Syllabus

6 Hrs.

Unit I: Basics of Nutrition and Macronutrients **6 Hrs.**

1. Nutrition – definition, importance, good nutrition and malnutrition; Balanced Diet: Basics of Meal Planning
2. Carbohydrates –functions, dietary sources, effects of deficiency.
3. Lipids –functions, dietary sources, effects of deficiency.
4. Proteins –functions, dietary sources, effects of deficiency.

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Unit II: Water and Micronutrients **4 Hrs.**

1. Importance of water– functions, sources, requirements and effects of deficiency.
2. Brief account of Vitamins- functions, food sources, effects of deficiency,
3. Macro and micro minerals –functions, effects of deficiency; food sources of Calcium, Potassium and Sodium; food sources of Iron, Iodine and Zinc

Unit III: Health-I **5 Hrs.**

1. Health - Determinants of health, Key Health Indicators, Environment health & Public health; Health-Education: Principles and Strategies.
2. Health Policy: Health Indicators and National Health Policy of Govt. of India-2017;
3. Health Organisations: Functioning of various nutrition and health organizations in India viz., NIN (National Institution of Nutrition), ICMR (Indian Council of Medical Research), WHO-India, UNICEF-India.

Unit IV: Health-II **5 Hrs.**

1. National Health Mission: National Rural Health Mission (NRHM) Framework, National Urban Health Mission (NUHM) Framework
2. Women & Child Health Care Schemes: Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCAH); Janani Shishu Suraksha Karyakaram (JSSK); Rashtriya Bal Swasthya Karyakram(RBSK); India Newborn Action Plan (INAP);
3. Disaster Management – Containment, Control and Prevention of Epidemics and Pandemics – Acts, Guidelines and Role of Government and Public

Unit V: Hygiene **10 Hrs.**

1. Hygiene – Definition; Personal, Community, Medical and Culinary hygiene; WASH (Water, **S**anitation and Hygiene) programme.
2. Rural Community Health: Village health sanitation & Nutritional committee (Roles & Responsibilities); About Accredited Social Health Activist (ASHA); Community & Personal Hygiene: Environmental Sanitation and Sanitation in Public places
3. Public Awareness through Digital Media - An Introduction to Mobile Apps of Government of India: NHP, Swatch Bharat, Pradhan Mantri Surakshit Mantritva Abhiyan (PM Suman Yojana), JSK Helpline, Ayushman Bhava, Arogya Setu, Covid-19 AP.