MANONMANIAM SUNDARANAR UNIVERISTY,
TIRUNELVELI-12

SYLLABUS

UG - COURSES – AFFILIATED COLLEGES

Course Structure for B. Sc. Zoology
(Choice Based Credit System)
(with effect from the academic year 2021-2022 onwards)

Semester-V				
Part	**Subject Status**	**Subject Title**	**Subject Code**	**Credit**
III	Core	DEVELOPMENTAL ZOOLOGY	CMZO51	4
III	Core	MICROBIOLOGY AND IMMUNOLOGY	CMZO52	4
III	Core	ANIMAL PHYSIOLOGY	CMZO53	4
III	Core	ECOLOGY	CMZO54	4
III	Major Practical V	DEVELOPMENTAL ZOOLOGY & MICROBIOLOGY AND IMMUNOLOGY	CMZOP5	2
III	Major Practical VI	ANIMAL PHYSIOLOGY	CMZOP6	1
III	Major Practical VII	ECOLOGY	CMZOP7	1
IV	Skill Based Common	PERSONALITY DEVELOPMENT/EFFECTIVE COMMUNICATION	CCSB51/ CCSB52	2

Total Marks: 100 Internal Exam: 25 marks + External Exam: 75 marks

A. **Scheme for internal Assessment**:
Maximum marks for written test: **20 marks**
3 internal tests, each of **I hour** duration shall be conducted every semester.
To the average of the **best two** written examinations must be added the marks scored in. The **assignment** for 5 marks.

The break up for internal assessment shall be:
Written test- 20 marks; Assignment -5 marks Total - 25 marks

B. Scheme of External Examination
3 hrs. examination at the end of the semester
A – Part : 1 mark question two - from each unit
B – Part : 5 marks question one - from each unit
C – Part : 8 marks question one - from each unit

- **Conversion of Marks into Grade Points and Letter Grades**

S.No	Marks	Letter Grade	Grade point (GP)	Performance
1	90-100	O	10	Outstanding
2	80-89	A+	9	Excellent
3	70-79	A	8	Very Good
4	60-69	B+	7	Good
5	50-59	B	6	Above Average
6	40-49	C	5	Pass
7	0-39	RA	-	Reappear
8	0	AA	-	Absent

- **Cumulative Grade Point Average (CGPA)**

$$\mathbf{CGPA} = \frac{\mathbf{\Sigma\,(GP \times C)}}{\mathbf{\Sigma C}}$$

- **GP** = Grade point, **C** = Credit
- CGPA is calculated only for Part-III courses
- CGPA for a semester is awarded on cumulative basis

- **Classification**
  a) First Class with Distinction : CGPA $\geq$ 7.5*****
  b) First Class : CGPA $\geq$ 6.0
  c) Second Class : CGPA $\geq$ 5.0 and $<$ 6.0
  d) Third Class : CGPA $<$ 5.0

DEVELOPMENTAL ZOOLOGY

LEARNING OBJECTIVES (LOs)

The objectives of the course are enabling the student to

- develop critical understanding to realise how a single celled fertilized egg becomes an embryo and become adult.
- understand the three important processes of cell division, cell differentiation and morphogenesis.
- get awareness about the relevance of developmental biology in medicine and its role in development of diseases.
- acquire knowledge on the life cycle and metamorphic stages in animals.
- determine the factors affecting embryogenesis and methods and gain knowledge on treatment and prevention of diseases.

COURSE OUTCOMES (COs)

On successful completion of course the student will be able to

CO1: find the processes right from fertilization of a single cell egg to the formation of a well-structured and functional multicellular organism.

CO2: understand and gain knowledge about the developmental stages like fertilization, cleavage and gastrulation.

CO3: compare the human embryo development to other animals and the regeneration, metamorphosis, transplantation and differentiations of stem cells in the organisms.

CO4: identify the integrative aspects of building of organisms and examine the developmental abnormalities and other conditions such as cancer.

CO5: analyse the developmental biology as a key subject in Zoology and justify it as a motor for research, in the human diseases and fertility.

CO6: assume and conclude that the embryonic development provides a thorough knowledge to study other subjects like genetics, evolution, physiology, cell and molecular biology etc.,

CO7: determine the mechanism and principles to develop an embryo.

UNIT I

GAMETES & FERTILIZATION

Basic concepts of Developmental Zoology- Structure & types of Spermatozoa and egg- Spermatogenesis –Oogenesis. Fertilization: mechanism and significance – Parthenogenesis.

UNIT II

BLASTULATION & GASTRULATION

Cleavage : Patterns – Blastulation- Morphogenetic movements -Gastrulation , Fate map in frog

UNIT III

ORGANOGENESIS

Development of Brain and Heart in Frog. Development of Pronephric, Mesonephric & Metanephric kidneys. Foetal membranes in Chick and Placentation in Mammals.

UNIT IV

APPLIED EMBRYOLOGY

Organizer concept – Mechanism of induction and competence. Nuclear transplantation in Acetabularia-Teratogenesis –Regeneration: types and mechanism. Embryonic stem cells and its significance.

UNIT V

EMBRYOLOGICAL TECHNIQUES

Infertility: causes and treatments- Assisted Reproductive Technology: Artificial Insemination- IVF and test tube baby - Embryo transfer. Twins - Erythroblastosis foetalis – Amniocentesis. Birth control.

Books for reference

1. Arumugam NA Text Book of Embryology, Biotechnology. Saras Publication Nagercoil.
2. Balnisky BI An Introduction to Embryology, W.B. Saunders and Co.
3. Berril NJ, Kars G (1986). Developmental Biology, McGrawHills
4. Gilbert SF (2010). Developmental Biology, IX Edition, Sinauer Associates, Inc., Publishers, Sunderland, Massachusetts, USA.
5. Majumdar NN. Vertebrate embryology; Tata McGraw-Hill, New Delhi.
6. Verma PS & Agarwal VK Chordate Embryology, S. Chand Publishers, New Delhi
7. Arora, M.P. Embryology. Himalayan Publishing House, Ramdoot, Dr. Bhalero Marg (Kelewadi) Girgaon, Mumbai – 400004.
8. Diwan,A.P.Avian Embryology, Anmol Publications Private Limited,4374/4B Ansari Road , Daryaganj, New Delhi-110 002.
9. Gilbert, Developmental Biology ,ANE Books India, Avantika Niwas, 19,Doraiswamy Road,T.Nagar,Chennai-600 017.
10. Goel, S. CP. Principles of Animal Developmental Biology,Himalaya Publishing House, N Ramdoot, Dr.Bhalerao Marg (Kelewadi)Girgaon,Mumbai

– 400 004.

11. Jain,P.C. Elements of Developmental Biology (Chordate Embryology).vishal Publishing Company, Books Market, Old Railway Road, Jalandhar – 144 008.
12. Jangir, O.P. Developmental Biology – A Manual. Agrobios (India),Behind Nasrani Cinema, Chopasani Road, Jodhpur – 342 002.
13. Nelson, E. Comparative Embryology of Vertebrates. Tata McGraw Hill Publishing Company Limited, No. 444/1 Sri Ekambara Naicker Industrial Estate, Alapakkam, Porur, Chennai – 600 116.
14. Ramesh Mathur and Meenakshi Metha. Embryology.Anmol Publications Private Limited,4374/4B,ansari road,Daryaganj,New Delhi – 110 002.
15. Rao, K.V. Developmental Biology. A Modern Synthesis. Oxford & IBH Publishing company Private Limited, S-155 Panchshila Park, New Delhi 110017.
16. Sastry.K.V. and VineetaShukal, Developmental Biology Rastogi Publications Gangotri, Shivaji Road, Meerut-250 002.
17. Slack, Essential Developmental biology. ANE Books India. Avantika Niwas, Doraiswamy Road,T.Nager,Chennai-600 017.
18. Subramoniam, T. Developmental Biology. Narosa Publishing House Private Limited,

MICROBIOLOGY AND IMMUNOLOGY

LEARNING OBJECTIVES (LOs)

The objectives of the course are enabling the student to

- impart knowledge on the taxonomy, organization and infection of microbes and to develop expertise in microbial techniques.
- give awareness on the basic principles of food, industrial and environmental microbiology.
- familiarize the fundamentals of immunology, importance of immune system, lymphoid organs and key principles of immune system.
- give an insight on immune response, antigens, antibodies, immunoglobulins and how they are related to health and diseases.

COURSE OUTCOMES (COs)

On successful completion of the course the student will be able to

CO 1: understand the structure, classification and culture techniques of microbes.

CO 2:analyse and distinguish food poisoning, food spoilage and preservation methods.

CO 3: develop entrepreneurial skills with the knowledge on the role of microbes in fermentation, microbial products and the role of pathogens in human infectious diseases.

CO 4: understand the concepts of immune system, cellular and molecular basis of immune responses, autoimmunity and immunoglobulins.

CO 5: describe the different types of lymphoid organs, antigen- antibody reactions, cells of immune system and their functions.

CO 6: infuse their knowledge on histocompatibility, and immunodeficiency to describe transplantation, vaccine and immunization techniques.

UNIT I

INTRODUCTION TO MICROBIOLOGY

Scope of Microbiology- Characters and Five kingdom classification . Ultrastructure of bacteriophage (T4 phage), E. coli and fungi (Yeast).

UNIT II

BACTERIAL CULTURE

Sterilization-Types of Culture medium –Culture of Bacteria –Bacterial growth and growth curve –factors influencing bacterial growth and maintenance. Staining of bacteria, Bio-fermenters and its role in mass culture.

UNIT III

APPLIED MICROBIOLOGY

Role of Microbes: Preservation of Milk –Microbes in Food Spoilage. Culture of Yeast and its economic importance - Microbial Nitrogen fixation .Fermentation : Ethanol and Penicillin production. Probiotics- SCP. Microbial diseases in man: Bacterial - Cholera & Typhoid; Viral- Rabies & HIV; Fungal - Candidiasis & Dandruff.

UNIT IV

BASIC IMMUNOLOGY

Scope: Immunity-classification and types; Lymphoid organs- types; Cells of immune system Types of immune responses. Immunoglobulin: types and Structure of IgG. Epitopes, Paratopes, Haptens & Adjuvants. Antigen- Antibody reactions ; T- Cell and B- Cell activation; Basic properties and functions of Cytokines, Interferons and complement proteins

UNIT V

APPLIED IMMUNOLOGY

Basic concepts of major histocompatibility complex (MHC) - Types of hypersensitivity. Concepts of autoimmunity and immunodeficiency ;Transplantation; Monoclonal antibodies- Vaccines & Immunization.

Books for reference

1. Dubey RC & Maheshwari DK, A Textbook of Microbiology, S. Chand Publishers, New Delhi.
2. Mani A, Selvaraj A.M, Narayanan L.M, Arumugam A, Microbiology, Saras Publication, Nagercoil.
3. Pelczar MJ, Chan EC, Pelczar MF. Elements of microbiology. McGraw-Hill International Book Company.
4. Ryan KJ, Ray CG, editors. Sherris medical microbiology. McGraw-Hill Education.
5. Willey JM, Sherwood L, Woolverton CJ. Prescott's microbiology. Singapore: McGraw-Hill.
6. Abul AbbasAndrew H. Lichtman Basic Immunology, Saunders.
7. Delves PJ, Martin SJ, Burton DR, Roitt IM. Essential immunology. John Wiley & Sons.
8. Ramesh SR, Immunology, Mcgraw Higher Ed.
9. Kuby, Immunology (W.H.Freeman)
10. C.B.Powar General Microbiology

CORE PRACTICAL: V DEVELOPMENTAL ZOOLOGY & MICROBIOLOGY AND IMMUNOLOGY

LEARNING OBJECTIVES (LOs)

The objectives of the practical course are enabling the student to

- know the systematic handling procedures and protocols.
- give importance to the microscopic examination of gametes and microbes.
- gain knowledge on the basic concepts and principles of techniques.
- familiarize the blood group identification and immunization.

COURSE OUT COMES (COs)

On successful completion of the practical course the student will be able to

CO1: recollect the fundamental procedure of Developmental Zoology, Microbiology & Immunology.

CO2: understand the principles and adopt the techniques for their future courses.

CO3: describe the structure and classification of microbes and immunoglobulisns.

CO4: apply the theoretical knowledge of food preservation, fermentation and immunization schedule.

CO5: evaluate the present situation to check any outbreak of contagious diseases.

CO6: conclude the prevalence of diseases in adverse condition and able to formulate solution to manipulate/ manage the dangerous situation.

DEVELOPMENTAL ZOOLOGY PRACTICALS

1. Mounting and Observation of live sperms of a vertebrate
2. Mounting and Observation of egg of a vertebrate
3. Temporary mounting and Observation of chick embryo development: 24, 48, 72 & 96 hours.

Museum Specimens, Slides, Models and Charts

4. Sperm of a vertebrate
5. Hen‟s egg/ Frog‟s egg
6. Blastula and Gastrula of frog
7. Chick embryo development stages – 24, 48, 72 & 96 hours
8. IUCD: Condom, Mala – D, Copper T / (any three)
9. Placenta in mammals: Discoidal, Cotyledonary, Zonary and Diffuse placenta.

MICROBIOLOGY PRACTICALS

1. Preparation of culture media for microbes and serial dilution technique.
2. Distribution of microorganisms in nature- soil, water & air.
3. Aseptic transfer of microbes & pure culture of bacteria and cultural characteristics of Micro-organisms.
4. Simple staining of bacteria
5. Gram‟s staining of bacteria
6. Serial dilution technique.
7. Microscopic examination of living bacteria - Hanging drop method.
8. Microscopic counting of microbes using Haemocytometer (Demonstration only)
9. Measurement of microbes using Ocular & Stage micrometers (Demonstration only)

Charts, Slides, Equipments and Photos

Autoclave, Hot air oven, Agar plate, Agar stab, Agar slant, Inoculation needle.

IMMUNOLOGY PRACTICALS

1. Identification of ABO blood grouping and Rh blood grouping among the students.
2. Lymphoid organs in Rat (Demonstration only)

Charts, Models, Slides and Photos:

T- Cell, B- Cell, Stem cells, Phagocytes - Thymus, Bone marrow, Spleen, Lymph node (T.S/ entire organ), Immunoglobulins - Ig G & Ig M.

ANIMAL PHYSIOLOGY

LEARNING OBJECTIVES (LOs)

The objectives of the course are enabling the student to

- find the basic understanding of the fundamental process and mechanism of the higher animals,
- understand the modifications and disorders o humans.
- develop knowledge about the functions of organs and tissues in different animals.
- elucidate the biological functions and how they adapt under various environmental conditions.
- analyse the animals‟ behaviour and their physiological response to their environment

COURSE OUTCOMES (COs)

On successful completion of the course the student will be able to

CO1: list out the physiological concepts in nutrition, digestion, metabolism, respiration etc.,

CO2: compare the various physiological processes in the animals.

CO3: identify the working mechanisms of effectors, homoeostasis and understand how the animals adapt in the environments.

CO4: analyse the fundamental interactions between physiology and endocrinology.

CO5: justify the correlation of structure, coordination of functions and working system in the organs in the human body.

CO6: determine and understand the various physiological disorders due to the imbalance of hormones, chemicals and metabolism.

CO7: develop thorough knowledge about the structure and function of the organisms and execute the ideas in research projects.

UNIT I

NUTRITION & RESPIRATION

Nutrition: Gastrointestinal tract of man. Digestion - role of enzymes and absorption of carbohydrates, proteins and lipids. Minerals & Vitamins – their deficiency. Respiration: Structure of lungs in man. Respiratory pigments: structure of haemoglobin, Transportation and exchange oxygen and carbon dioxide – Bohr‟s effect - bronchitis, asthma - Physiological effects of smoking.

UNIT II

CIRCULATION & EXCRETION

Blood- composition and functions, Mechanism of clotting. Structure of heart – Heart beat & Pace maker – Cardiac cycle – ECG – Pulse rate and Blood Pressure- Heart diseases. Kinds of excretory products & Patterns of excretion in animals- Structure of kidney - Nephron - mechanism of urine formation - composition of urine – Nephritis- Dialysis.

UNIT III

MUSCLE & NERVE PHYSIOLOGY

Types of muscles, Ultrastructure of striated muscle - Muscle contraction & properties. Simple muscle twitch- Tetanus – Muscle fatigue. Neurons – structure & types - Impulse propagation, synaptic transmission, neurotransmitters - Reflex action, Nerve disorders – epilepsy, Alzheimer‟s disease, Parkinson‟s disease.

UNIT IV

SENSE ORGANS

Eye: structure, physiology of vision, visual elements and pigments. Eye defects- myopia, hyperopia, presbyopia, astigmatism, cataract, glaucoma. Ear: Structure and mechanism of hearing - Hearing impairments – deafness, labyrinthine disease. Olfactory, gustatory and tactile and mechanical sense organs.

UNIT V

ENDOCRINE GLANDS & REPRODUCTIVE PHYSIOLOGY

Endocrine glands and Hormones: Structure, their action and disorders- Pituitary, Thyroid, Parathyroid, Adrenal, Islets of Langerhans, Testis & Ovary. Reproductive Physiology : Testis and Ovary- Graafian follicles- menstrual cycle- puberty, adolescence, pregnancy, parturition, lactation, menopause. Oestrous cycle in cattle.

Books for reference

1. Arumugam N & Mariakuttikan A Animal Physiology Saras Publications, Nagercoil.
2. Bhagavan NV, Medical biochemistry, fourth edition Academic Press
3. Guyton AC, Hall JE, Text Book of Medical Physiology, Elsevier
4. Jain AK Textbook of Physiology. Avichal Publishing Company.
5. Lehninger AL, Michael Cox, Nelson DL, Biochemistry. Macmillan.
6. Tyagi BS, Agarwal VK & Verma PS Animal Physiology S. Chand Publishers,New Delhi.
7. Hoar, W.S.(1975). Text Book Of Medical Physiology, W.B. Saunders Co.
8. Juneja, Kavita, Animal physiology. Anmol Publications Pvt. Ltd, 4374/4B AnsariRoad, Daryaganj. New Delhi
9. Nagabhushanam, R.M.S. Kodarkar and R. Sarogini. Text Book of Animal Physiology 2nd Edition. Oxford & IBH Publishing Company Private Limited, S – 155, Panchshila Park, New Delhi.
10. Nigam, H.C. Animal Physiology. Vishal Publishing Company, Books Market Old Railway Road,Jalandhaar.
11. Prosser, L. and A. Brown Comparative Animal Physiology. Saunders &Co.Philadelphia.
12. Prosser,C.L.(1978). Comparative Animal Physiology. W.B. Saundersco.
13. William, S. Hoar, General and Comparative Physiology. Prentice – Hall of India,M-97 Connaught Circus, NewDelhi.

CORE PRACTICAL : VI - ANIMAL PHYSIOLOGY

LEARNING OBJECTIVES (LOs)

The objectives of the practical course are enabling the student to

- know the principle of the rate of oxygen consumption of a fish.
- understand the physiological function by experiments.
- attain a level of understanding to handle practicals.
- gain knowledge on basic physiological functions.

COURSE OUTCOMES (COs)

On successful completion of the practical course the student will be able to

CO1: find and calculate the rate of oxygen consumption of a fish by Winkler‟s method.

CO2: analyse the effect of temperature on physiological activity.

CO3: verify the basic principles and appl it to solve the problem.

CO4: compare the results and confirm the qualitative tests.

CO5: design an experiment to prove the physiological principles and concepts.

PRACTICALS

1. Rate of Oxygen consumption in a fish.
2. Effect of temperature on the Opercular movement of a fish – Calculation of Q10.
3. Action of Salivary amylase in relation to enzyme concentration.
4. Qualitative test for carbohydrate (glucose), protein and lipid.
5. Demonstration of blood pressure using Sphygmomanometer.
6. Estimation of Haemoglobin – demonstration only.
7. Counting of different kinds of blood cells using Haemocytometer – demonstration only.
8. Qualitative test for Ammonia, Urea and Uric acid.

Slides, Models and Charts – Glucose, Fructose, Glycogen, Amino acid, Cholesterol, Intestinal villi, Haemoglobin, Myoglobin, ECG, Sphygmomanometer, Haemometer, Haemocytometer, Kymograph, Cardiac muscle, Striated muscle and Non – Striated muscle, Simple muscle twitch. Testis, Ovary- T.S

ECOLOGY

LEARNING OBJECTIVES (LOs)

The objectives of the course are enabling the student to

- know the fundamental concepts and facts about the environment and the interaction of its various components.
- study the recycling of nutrients in lieu with biogeochemical cycles
- understand about various types of ecosystems.
- make an awareness about various effects of pollution and its management
- elucidate the importance of biodiversity and need for its conservation.

COURSE OUTCOMES (COs)

On the successful completion of the course the student will be able to

CO1: recall the principles, applications and concepts of ecology and ecosystem, how biotic and abiotic factors that are related to ecosystem.

CO2: understand how the animals interact with each other and their natural environment.

CO3: analyse and compare the differences in the structure and function of different types of ecosystem.

CO4: emphasize the role of key factors responsible for changes in natural ecosystem such as pollution and urbanization and capable of pollution and other effects.

CO5: interpret the diversity of species in relation to natural process and sustenance of life.

CO6: apply the acquired knowledge in ecology to solve and manage the current environmental issues and problems.

UNIT I

ECOLOGICAL CONCEPTS

Ecosystem: concept, structure & function. Abiotic factors and its ecological role: Soil, Light, Temperature, Water- Limiting factors. Food chain & Food web, Pyramids - Trophic levels- Energy flow. Population Ecology – Community Ecology.

UNIT II

NUTRIENT CYCLES & INTERACTIONS

Biogeochemical cycles: Carbon, Sulphur, Nitrogen and Phosphorous. Animal relationships: Mutualism, Commensalism, Parasitism, Competition and Predation.

UNIT III

HABITAT ECOLOGY

Ecosystem: characteristic features and types: Freshwater - Lotic & Lentic, Marine,

estuarine, mangrove, tundra, Savanna, cave, forest and desert ecosystems. Ecotone & edge effect. Ecological succession, Significance & Conservation of wetlands, Ecological effects of dams, hydroelectric projects.

UNIT IV

POLLUTION

Types, causes, effects & management of Land, Water, Air, Thermal, Noise & Pesticide pollution. Nuclear Hazards –Management of Solid waste, Plastic waste, Medical waste and e-waste.

UNIT V

CONSERVATION

Biodiversity– definition, loss & cause. IUCN, CITES - Brief out lines of Indian laws of conservation. Biodiversity hot spots in India. Indian Endangered species & conservation, Community reserves, Sanctuaries, National Parks and Tiger Reserves in Tamil Nadu. Afforestation & Deforestation. Human and animal conflicts.

Books for reference

1. Arumugam N Concepts of Ecology, Saras Publication, Nagercoil.
2. Gupta PK, Cytology, Genetics & Evolution, Rastogi Publications, Meerut.
3. Verma PS,& Agarwal VK, Environmental Biology: Principles of Ecology, S Chand Publishers, New Delhi.
4. Sharma PD, Elements of Ecology, Rastogi Publications, Meerut.
5. Chapman JL & Reiss MJ, Ecology: Principles and Applications, Cambridge University Press, New Delhi.
6. Odum EP, Fundamentals of Ecology, W.B Saunders College Publishing, Philadelphi, USA..
7. Arumugam N Organic Evolution, Saras Publication, Nagercoil.
8. Caughley G, Sinclair AR. Wildlife ecology and management. Blackwell Science.
9. Divan S, Rosencranz A. Environmental law and policy in India: Cases, materials and statutes. New Delhi: Oxford University Press. Arora, M.P. Ecology. Himalaya Publishing House, Ramdoot, Dr.Bhalerao Marg, Girgaon, Mumbai- 400 004.
10. Clarke, G.L. Elements of Ecology, John Wiley & sons Inc. New York.
11. Junega, Kavita. Ecology. Anmol Publications Private Limited, 4371/4B Ansari Road,
12. Madhab, C.Dash. Fundamentals of Ecology. Tata McGraw Hill Publishing Company Limited,No.444/1.Sri EkambaraNaicker Industrial Estate, Alapakkam, Porur, Chennai – 600 116.

13. Purohit, S.S. A Text book of Environmental Science, Student Edition, Agrobios (India), Behind Nasrani Cinema, Chopasani Road, Jodhpur – 342 002.
14. Singh, H.R. and Neeraj Kumar. Ecology and Environmental Science, Vishal Publishing Company, Books Market, Old Railway Road, Jalandhar – 140 008.
15. Singh, S.P.Animal Ecology, 6th Edition, Rastogi Publications, Gangotri, Shivaji Road, Meerut – 250 002.

CORE PRACTICAL VII- ECOLOGY

LEARNING OBJECTIVES (LOs)

The objectives of the practical course are enabling the student to

- determine the physicochemical parameters of the water samples.
- identify the planktons in the aquatic habitat.
- know the examples for animal associations and its ecological importance.
- illustrate the ecological adaptations with examples.

COURSE OUTCOMES (COs)

On successful completion of the practical course the student will be able to

CO1: compare and interpret the results of estimated the physicochemical parameters of the water samples.
CO2: analyze and understand the planktonic adaptations.
CO3: develop the skill to explain the ecological adaptations with specific examples.
CO4: create awareness to conserve the natural habitat

PRACTICALS

1. Estimation of pH – ant 2 water samples
2. Estimation of total solids- any 2 water samples
3. Estimation of turbidity using Secchi disc.
4. Estimation of dissolved oxygen – any 2 water samples
5. Estimation of carbon dioxide – any 2 water samples
6. Estimation of total and phenolphthalein alkalinity- any 2 water samples
7. Identification of any two zooplanktons either fresh water or marine,
8. Visit to Sanctuaries and National Parks- Report (Mandatory)

Museum specimens, slides, models and charts

Mutualism :Hermit crab and Sea anemone; Commensalism: Echeneis and Shark; Parasitism: Sacculina on Crab; Predation: Snake and Rat. Effect of temperature: Cyclomolphosis- Daphnia; Effect of light: Protective Colouration - Leaf insect and Colour changes - Chamaeleon.

Charts: Ecosystem- Pond; Food Chain –.Forest Ecosystem-; Food Web – Grass land.

PERSONALITY DEVELOPMENT

UNIT I: INTRODUCTION

Concept of personality - Dimensions of personality – Significance & Stages of personality development - Elements of Success

UNIT II POSITIVE ATTITUDE & SELF-MOTIVATION

Attitude - Concept - Significance - Factors affecting attitudes - Positive attitude – Advantages –Negative attitude- Disadvantages - Ways to develop positive attitude - Differences between personalities having positive and negative attitude. Concept of motivation - Significance – Internal and external motives - Importance of self-motivation-Factors leading to de-motivation

UNIT III SELF DEVELOPMENT SKILLS

Emotional Adjustment - Self-Awareness – Self-esteem - Self-Confidence - Stress CopingAbility – Time Management

UNIT IV SOCIAL SKILLS DEVELOPMENT

Assertiveness - Interpersonal Relationship – Problem Solving - Decision Making - ConflictResolution

UNIT V SERVICE ORIENTATION & EMPLOYABILITY QUOTIENT

Social Concern - Value System and Culture; Resume building- Developing Group DiscussionSkills – Facing the Mock Interview Sessions

Text Books:

1. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGraw Hill.
2. Bhatia, R. C. (2010). Personality Development, Ane Books Pvt. Ltd., Chennai.
3. Aurther, J. (2006). Personality Development. Lotus Press, New Delhi.

Reference Books:

1. Andrews, Sudhir. How to Succeed at Interviews. 21st (rep.) New Delhi.Tata McGraw-Hill 1988.
2. Stephen P. Robbins and Timothy A. Judge (2014), Organizational Behavior 16th Edition: Prentice Hall.
3. Hindle, Tim. Reducing Stress. Essential Manager series. Dk Publishing, 2003
4. Mile, D.J Power of positive thinking. Delhi. Rohan Book Company, (2004).
5. Pravesh Kumar. All about Self- Motivation. New Delhi. Goodwill Publishing House.2005.
6. Seven Habits Of Highly Effective People – Stephen Covey
7. You Can Win – Shiv Khera

EFFECTIVE COMMUNICATION

Objectives:

- To impart effective communication skills to enrich students' personality development and self confidence
- To enhance the students' employability skills
- The courses will help to bridge the gap between the skill requirements of the employer or industry and the competency of the students

Teaching Methodology:

Lectures, Practical classes, Video, Public speaking, Group Discussion and Case Studies

Unit – I Introduction

Introduction to Communication, Flow of Communication, Elements of Communication and their characteristics - Models of Communication - Barriers to Communication, How to overcome barriers of communication.

Unit – II Understanding Human Communication

Types of Communication transactions, Culture and communication- Signs, symbols and codes in communication, Tools of communication (Oral, written, one way, two way, verbal and nonverbal, vertical and horizontal and lateral) Business communication-Body language.

Unit – III Effective Communication

Concept, nature and relevance to communication process: - Empathy - Persuasion - Perception - Listening - Learning and Audio-Visual Aids- concept and classification

Unit – IV Language and Communication

Listening skills– Etiquette (Personal, social, telephone, email and global), Types of Listening, Barriers to Effective Listening & Traits of a Good Listener, Language for Communication: Language and Communication; General Principles of Writing; Improving Writing Skills, Essentials of good style, Expressions and words to be avoided

Unit – V Employment Communication

Soft Skills: Empathy - Intrapersonal skills - Interpersonal skills - Problem solving – Reflective thinking - Critical thinking - Negotiation skills, Employment Communication – Resume:Contents of Good Resume; Job Interview- Job Interview Techniques- Manners and etiquettes tobe maintained during an interview; and Presentation skills.

References:

- SOFT SKILLS, 2015, Career Development Centre, Green Pearl Publications.
- Barker, L. (1990). "Communication", New Jersey: Prentice Hall, Inc; 171.
- Devito, J. (1998) Human Communication. New York: Harper & Row.
- Patri and Patri (2002); Essentials of Communication. Greenspan Publications