**GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA**

**LESSON-PLAN (Session 2024-25) ODD SEMESTER**

**Name of Teacher**: Diksha Bhanot

**Designation: Assistant Professor**

**Class: M.Sc. 2nd Year**

**Subject/ Paper: Molecular Biology (M-Z-301 (Core)**

**Type of course ( major/ minor/ VAC/ AEC/SEC/ MDC): Major**

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| Sr. No. | Subject & Class  Month | **Topics to be covered** | **Teaching Learning Strategy** | **Learning Outcomes of Students** | **Remarks** |
| 1. | July & August | **DNA Replication**  Prokaryotic and Eukaryotic DNA replication, Mechanics of DNA replication, Enzymes and accessory proteins involved in DNA replication  **Transcription**  Prokaryotic and Eukaryotic transcription, General and specific transcription factors, Regulatory elements and mechanisms of transcription regulation, Transcriptional and post-transcriptional gene silencing.  Post-transcriptional Modifications in RNA, 5'-Cap formation, 3'-end processing and polyadenylation  Splicing, Editing, Nuclear export of mRNA, mRNA stability | **Group learning and teaching.**  **Learning through problem solving**  **Project based learning**  **Video clips,**  **Power point presentations** | DNA replication and transcription.  The student will also be able to understand difference in prokaryotic and eukaryotic replication and transcription | Orientation  class and  feedback of last  semester  teaching.  Discussion of  the method of  teaching which  is most effective  for students. |
| 2. | September | **Translation**  Genetic code and deciphering of genetic code, Prokaryotic and Eukaryotic translation, The translational machinery, Adaptor hypothesis, Kozak rule, Mechanisms of initiation, elongation and termination, Regulation of translation  **Transport of Protein**  Co- and Post-translational transport of proteins, Co- and Post-translational modifications of proteins, Protein trafficking/sorting | **Group learning and teaching.**  **Learning through problem solving**  **Project based learning**  **Video clips,**  **Power point presentations** | The students will be  able to understand  concept of translation and protein transportation.  The students will have thorough understanding of genetic code and related rules. |  |
| 3. | October | **Recombination and Repair**Holiday junction, gene targeting, gene disruption, Cre/lox recombination, RecA and other recombinases, DNA repair mechanisms  **Antisense and Ribozyme technology**  Molecular mechanisms of antisense molecules, Inhibition of splicing, polyadenylation and translation, Disruption of RNA structure and capping, Biochemistry of ribozyme; hammerhead, hairpin and other ribozymes, Strategies for designing ribozymes, Application of antisense and ribozyme technologies  **Molecular mapping of genome**  Genetic and physical maps, Physical mapping and map-based cloning, Southern and fluorescence *in situ* hybridization for genome analysis, Chromosome micro-dissection and micro-cloning, Molecular markers in genome analysis RFLP, RAPD and AFLP analysis and their applications, Molecular markers linked to disease resistance genes | **Group learning and teaching.**  **Learning through problem solving**  **Project based learning**  **Video clips,**  **Power point presentations** | The students will be  able to understand  concept of recombination, DNA repair, antisense and ribozyme technology.  The student will also develop understanding of mapping techniques and other related applications. |  |
| 4. | November | **rDNA Technology:** Gene-cloning,Vectors, cDNA and genomic liberaries, Blotting techniques, Chromosome walking  Application of rDNA technology  **Revision** | **Group learning and teaching.**  **Learning through problem solving**  **Project based learning**  **Video clips,**  **Power point presentations** | The students will be  able to understand  concept of recombinant DNA technology and its application. |  |
| 5. | **December** | **Revision & test** | **Group learning and teaching.**  **Learning through problem solving**  **Self study**  **Project based learning**  **Video clips,**  **Power point presentations** | The students will be elicited and motivated for self study, any queries will be solved. to students and answer writing will be taught. |  |

* **Seminar/Presentation/Assignment/Quiz/Class Test /Mid-Term Exam will be taken as per schedule.**

**Signature of Teacher Principal**

**GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA**

**LESSON-PLAN (Session 2024-25) ODD SEMESTER**

**Name of Professor**: TARA JAYANT

**Designation:** ASSOCIATE PROFESSOR

**Subject/ Paper:** PAPER MZ-306 Elective **(Fish,** **Fisheries and Aquaculture – I)**

**Class:** M.Sc. ZOOLOGY 3rd SEMESTER

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| **S. No.** | **Month** | **Topics to be covered** | **Teaching Learning Strategy** | **Learning Outcomes** | **Remarks if any** |
| **1.** | **August**  **2024** | Introduction to syllabus, books and examination pattern for theory.  Definition of Fish, Fisheries and aquaculture; Types of Aquaculture.  Classification of fishes with distinguishing characters and examples of each group.  Estuarine, Marine, Riverine and wetland fisheries: characteristic species and their exploitation.  **Culture fisheries**   * Cultivable organisms for aquaculture. * Criteria of selection of cultivable fishes. | Power Point Presentation and Video Demonstration | Students will  learn  identification of  fish species  using  classical  morphological  methods. | **Revision test of topics covered.** |
| **2.** | **September 2024** | Design, construction and maintenance of fish culture ponds.  **Ecology of fish pond ecosystem**   * Physico chemical conditions of ponds water and soil. * Biological conditions of waters. * Weeds and their control. * Productivity of fish pond. * Classification of water bodies on the basis of productivity.   **Aquatic pollution**: Sources of water Pollution, Impact of pollution on aquatic organisms, Impact of exotic fish species on aquatic biodiversity, Fishes and their relationships with abiotic and biotic factors.  Aquaculture Ranching and Rational fishery. | Power Point Presentation and group discussion | It will generate knowledge about various methods and significance of aquaculture and impact of aquatic pollution on fishes. | **Revision test of topics covered.** |
| **3.** | **October 2024** | Fish integument: Exoskeleton and colouration  Fins: origin, types and functions  Food and feeding habits of fishes, Digestion in fishes  Respiratory system Gill structure and functions, Accessory respiratory organs swim bladder and webberian ossicles  Osmoregulation in fishes | Power Point Presentation by teacher and students. | It will create awareness about structure and function of important organ systems of fishes. | **Revision test of topics covered.** |
| **4.** | **November 2024** | **Receptors in fishes**  Chemoreceptors  Lateral line organs  Eye Ear  Pineal organ  Hormones and reproduction: Induced breeding in carps and catfishes.  Identification of different maturity stages of fishes.  Migration in fishes  Age and growth studies | Power Point Presentation, video demonstration. | Students will be able to know important physiological processes in fishes. | **Sessional Exam** |
| **5.** | **December 2024** | UNIVERSITY EXAMINATION |  |  |  |

* **Sessional Exam will be taken as per schedule.**

**Signature of Teacher Principal**

**GOVT. P.G. COLLEGE FOR WOMEN, SECTOR-14, PANCHKULA**

**LESSON-PLAN (Session 2024-25) ODDSEMESTER**

**Name of Teacher**: Dr. Nancy

**Designation:** Assistant Professor of zoology

**Class:** M.Sc. II (ZOOLOGY)

**Subject/ Paper: Molecular Endocrinology / M-Z-302**

**Type of course( major/ minor/ VAC/ AEC/SEC/ MDC):-----**

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| **S. No.** | **Month** | **Topics to be covered** | **Teaching Learning Strategy** | **Learning Outcomes of Students** | **Remarks** |
| **1.** | **AUGUST** | Basic concept of endocrinology, its scope and role in molecular biology.  **Chemical nature of hormones;** Amino-acid derived hormones**,** Peptide hormones **,** Glyco-protein hormones,Steroid hormones and Prostaglandin  Biosynthesis of peptide hormones, transcriptional and post-transcriptional modifications. Biosynthesis and secretion of thyroid hormones. Thyroid hormone disorders | **Group learning, project based learning & teaching, learning through problem solving** | It helps in explaining hormonal synergism and antagonism at the molecular level | Unit Test |
| **2.** | **SEPTEMBER** | Prostaglandin structure, type, synthesis and biological activities.  Mechanism of action of peptide hormones; concept of second messengers, cAMP, cGMP, Ca++, IP3, DAG, NO, signal transduction mechanisms.  Mechanism of action of steroid hormones; Cross talk concept, Heat shock proteins | **Group learning, project based learning & teaching, learning through problem solving** | It will make students understand the basic structure and chemical organization of hormones and various signaling molecules. | Unit Test |
| **3.** | **OCTOBER** | **Hormonal regulation of Metabolism:**  Role of Insulin & Glucagon in regulation of Carbohydrate metabolism. Metabolic regulatory hormones in Lipid & Protein metabolism  Gastrointestinal hormones and their role in regulation of metabolic activity. Endocrine regulation of calcium and phosphate homeostasis in mammals. | **Group learning, project based learning & teaching, learning through problem solving** | Develop an in-depth comprehensive knowledge of endocrinology from a physiological, cellular, and molecular perspective | Sessional exam. |
| **4.** | **NOVEMBER** | Genetic basis of hormonal disorders. General principle and classification of hormonal disorders. Genetic basis of growth hormone disorder. Genetic basis of PCOS.  Sequence-specific DNA binding receptor proteins , Nuclear receptor proteins, Cytosolic receptor proteins, Cell surface receptor proteins. Their role in gene transcription, cell differentiation and cell proliferation.  Regulatory substances –Eicosanoids,Growth factors, Thymus gland & Kinins. | **Group learning, project based learning & teaching, learning through problem solving** | Students will be able to identify the organs involved in the endocrine function and an understanding of appropriate key human endocrine disorder will also be developed | Revision and Test |
| **5.** | **December** | Revision and test |  |  |  |

* **Seminar/Presentation/Assignment/Quiz/Class Test /Mid-Term Exam will be taken as per schedule.**

**Signature of Teacher Principal**