

DEPARTMENT OF INDUSTRIAL FISH AND FISHERIES
LESSION PLAN
SESSION 2023-24
SEMESTER – V

NAME OF TEACHER: TINKEY ACHARYA

PAPER ALLOTTED: IFFACOR1 1T, IFFACOR1 1P, IFFACOR12T,
IFFACOR12P, IFFADSEO3P

| Month | Paper | Topic | No of classes |
|-----------------------------------|---|--|---------------|
| September 2023 (25.09.2023) | IFFACOR11T | Bacterial, Fungal ,Viral, Protozoan and Metazoan diseases Bacterial diseases- infectious abdominal dropsy, tail and fin rot. Fungal diseases- Saprolegniasis, Branchiomycosis, Ichthyophonus disease, Laginedium disease, Fusarium disease. Viral diseases in finfishes – Infectious Haematopoietic Necrosis, Infectious Pancreatic Necrosis, Viral Haemorrhagic Septicaemia, Spring Viraemia of carps, Channel catfish disease, Lymphocystis disease. | 10 |
| October 2023 | IFFACOR11T | Viral pathogens in shell fishes- <i>Baculovirus penaeii</i> , White spot syndrome virus, Monodon baculovirus, baculovirus midgut necrosis, Hepatopancreatic virus, Yellow head baculovirus, Systemic Ectodermal Mesodermal baculovirus, Protozoan disease- Ichthyophthiriasis, Costiasis, whirling disease, Trypanosomiasis. Metazoan diseases- Dactylogyrosis, Gyrodactylosis, Hirudinosis, Lernaeosis and Argulosis. | 10 |
| | IFFACOR11P | Sterilization technique- dry heating, autoclaving Media preparation Isolation and maintenance of bacteria from fishes and water. Gram staining of bacteria | 8 |
| | IFFACOR12T | Marine Biotechnology Application of tissue culture in sea weed and pearl production. Marine toxins. Industrial chemicals and pharmaceuticals from marine sources. Use of probiotics and antibiotics in aquaculture operations. | 8 |
| | IFFACOR12P | Mitotic and meiotic chromosome preparation and their identification in fish. | 4 |
| | IFFADSEO3P | Identification of common ornamental fishes and plants. Fabrication of all-glass aquarium. Setting up and maintenance of Aquarium accessories and equipment. | 6 |
| October 2023 | PUJA VACATION (19.10.2023 to 15.11.2023) | | |

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|-------------------------------------|------------|---|-----------|
| November 2023 | IFFACOR11T | Immunology and Fish health management Introduction to fish immunology and terminologies; Defense system and mechanism in fish and shellfish: innate and acquired immunity. Application and development of vaccines and antibiotics. General preventive methods and prophylaxis. Methods for disease control and management, chemotherapeutic agents, host management, prophylaxis- vaccines, adjuvants, immunostimulants and probiotics. Use and abuse of antibiotics and chemicals in health management. Fish health and quarantine systems. Seed certification, SPF and SPR. Good pond management practices | 12 |
| | IFFACOR11P | Enumeration of bacteria by TPC method Enumeration of total coliforms (MPN technique) Identification of various finfish / shellfish disease Parasite in fishes, protozoan (Ichthyophthiriasis, Trichodiniasis, whirling diseases) helminths (Dactylogyrosis and Gyrodactylosis), crustaceans (Lernaeosis, Argulosis) | 10 |
| | IFFADSEO3P | Setting up of breeding tank for live bearers, barbs, goldfish, tetras, chichlids, gouramis, fighters and catfishes. Identification of ornamental fish diseases and prophylactic measures. | 10 |
| 1 st Week of Dec 2023 | IFFACOR11T | Methods of pathological examinations of fish and infectious diseases. Evaluation criteria of healthy seeds. Good feed management for healthy organisms. | 4 |
| 3 rd Week of Dec 2023 | | Internal Examination & Class for Slow Learners | |
| Jan 2024 | | END SEMESTER EXAMINATION | |
| Total Classes | | | 82 |

NAME OF TEACHER: DR. NANDITA MUKHERJEE

**PAPER ALLOTTED: IFFACOR1 1T, IFFACOR1 1P, IFFACOR12T,
IFFACOR12P, IFFADSEO 1T, IFFADSEO 1P**

| Month | Paper | Topic | No of classes |
|-----------------------------------|------------|---|---------------|
| September 2023 (25.09.2023) | IFFACOR11T | Isolation and culture of microbes Prokaryotic growth – characteristic features of bacterial growth curve – Effect of environmental factors on growth. Nutrition and growth of bacteria – different types of media for isolation of bacteria and fungi. | 5 |
| | IFFACOR12P | Mitotic and meiotic chromosome preparation and their identification in fish. | 4 |

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| | | Karyotype study. | |
| October 2023 | IFFACOR11T | Introduction & Structure of microbes General characteristics of bacteria, fungi, viruses, algae and protozoans. Structure and function of bacterial cell wall, plasma membrane, capsule, flagella and endospore. Structure of fungi and yeast cell. Structure of virus. | 5 |
| | IFFACOR11P | Sterilization technique- dry heating, autoclaving Media preparation Isolation and maintenance of bacteria from fishes and water. Enumeration of bacteria by TPC method Enumeration of total coliforms (MPN technique) | 12 |
| | IFFACOR12T | Chromosome manipulation in fish Polyploidy, gynogenesis and androgenesis. Monosex production, super male and super female fish production techniques, sex reversal - methods. Cryopreservation of gametes. | 10 |
| | IFFACOR12P | Isolation of DNA from fish blood. | 2 |
| | IFFADSEO1T | Fish feed preparation Nutritional requirement of cultivable fish and shell fish. Feed formulation and manufacturing. Forms of feeds-moist feed, dry feeds, mashes, pelleted feeds, floating and sinking pellets. Feed additives, binders, antioxidants, enzymes, pigments, growth promoters, feed stimulants, and uses of probiotics. | 10 |
| October 2023 | PUJA VACATION (19.10.2023 to 15.11.2023) | | |
| November 2023 | IFFACOR11T | Isolation and culture of bacteria and fungi from water and sediment. Different culture techniques. | 4 |
| | IFFACOR12T | Selection and Hybridization Principles of breeding - methods and selection, selective hybridisation, intra-specific and inter-specific hybridisation – GIFT tilapia. Hybrid vigor, inbreeding and cross breeding. | 10 |
| | IFFADSEO1T | Feed storage, use of preservatives and antioxidants. Fish evaluation- feed conservation ratio, feed efficiency ratio, protein efficiency ratio, net protein utilization and biological value | 6 |
| | IFFADSEO1P | Proximal composition analysis of feed ingredients & feeds. Preparation of artificial feeds using locally available feed ingredients. | 8 |

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| | | Determination of sinking rate and stability of feed. | |
| 1st Week of Dec 2023 | IFFADSEO1T | Feeding devices and methods: - Nutritional deficiency diseases. | |
| | IFFADSEO1P | Effect of storage on feed quality. Visit to a fish feed farm. | 2 |
| 3rd Week of Dec 2023 | | Internal Examination & Class for Slow Learners | |
| Jan 2024 | | END SEMESTER EXAMINATION | |
| Total Classes | | | 78 |

NAME OF TEACHER: DR. DIBYENDU DUTTA

**PAPER ALLOTTED: IFFACOR1 1T, IFFACOR1 1P, IFFACOR12T,
IFFACOR12P, IFFADSEO3P**

| Month | Paper | Topic | No of classes |
|--|-------------------|--|----------------------|
| September 2023 (25.09.2023) | IFFACOR11T | Health significant bacteria in culture ponds. Culture characteristics and epidemiology of E. coli. Perishability of seafood – Microbial spoilage of fish and shell fish. | 5 |
| | IFFACOR11P | Gram staining of bacteria | 2 |
| October 2023 | IFFACOR11T | Aquatic and fish microbiology Microflora of aquatic environment. Autotrophic and heterotrophic microorganisms in aquatic environment. Nutrient regeneration, role of microbes in biogeochemical cycles – Carbon, Nitrogen, Phosphorus and Sulphur cycles. | 5 |
| | IFFACOR11P | Identification of various finfish / shellfish disease Parasite in fishes, protozoan (Ichthyophthiriasis, Trichodiniasis, whirling diseases) helminths (Dactylogyrosis and Gyrodactylosis), crustaceans (Lernaeosis, Argulosis) | 8 |
| | IFFACOR12T | Basic Genetics Structure of Chromosome & DNA, Knowledge of gene, Genotypes & Phenotypes, Principles of genetics. | 6 |
| | IFFACOR12P | Mitotic and meiotic chromosome preparation and their identification in fish. Karyotype study. | 6 |

| October 2023 | PUJA VACATION (19.10.2023 to 15.11.2023) | | |
|----------------------------------|---|--|----|
| November 2023 | IFFACOR11T | Spoilage microflora. Intrinsic and extrinsic factors affecting spoilage. Microflora associated with body parts. Food borne pathogens. Sources of contamination. | 5 |
| | IFFACOR12T | Mendel's law of inheritance - allelic and non-allelic interactions of genes – complete, incomplete, pleiotropism, epistasis, supplementary and complementary genes. Biochemical genetics, quantitative genetics, population genetics | 8 |
| | IFFACOR12P | Isolation of DNA from fish blood | 2 |
| | IFFADSEO3P | Setting up of breeding tank for live bearers, barbs, goldfish, tetras, chichlids, gouramis, fighters and catfishes. | 12 |
| 1 st Week of Dec 2023 | IFFACOR12T | Basic Molecular Genetics, DNA Replication | 4 |
| 3 rd Week of Dec 2023 | | Internal Examination & Class for Slow Learners | |
| Jan 2024 | | END SEMESTER EXAMINATION | |
| Total Classes | | | 63 |

NAME OF TEACHER: AJANTA LAHIRI

PAPER ALLOTTED: IFFACOR 1 1T, IFFACOR 1 1P, IFFACOR12T,
IFFADSEO3T, IFFADSEO3P

| Month | Paper | Topic | No of classes |
|--------------------------------|------------|---|---------------|
| September 2023 (25.09.2023) | IFFACOR11T | Common bacterial diseases of fin fishes. Management of culture systems. Disease and environment. | 5 |
| | IFFACOR11P | Identification of various finfish / shellfish disease Parasite in fishes, protozoan (Ichthyophthiriasis, Trichodiniasis, whirling diseases) helminths (Dactylogyrosis and Gyrodactylosis), crustaceans (Lernaeosis, Argulosis) | 4 |
| | IFFADSEO3T | Ornamental Fish Production and Management World trade of ornamental fish and export potential. Fabrication, setting up and maintenance of freshwater and marine aquarium. Water quality management. | 4 |
| October 2023 | IFFACOR11T | Pathology and Fish Parasitology: Pathogenic Vibrios, <i>Salmonella</i> , <i>Aeromonas hydrophila</i> , and <i>Pseudomonas</i> . | 8 |

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| | IFFACOR12T | Aquaculture Biotechnology Recombinant DNA technology,. Aquaculture biotechnology- Biotechnological tools for aquaculture, gene manipulation in fish, transgenic fish production, transgenic synthetic hormone for fish breeding. | 10 |
| | IFFADSEO3T | Different varieties of exotic and indigenous fishes. Principles of a balanced aquarium. | 4 |
| | IFFADSEO3P | Identification of common ornamental fishes and plants. Fabrication of all-glass aquarium. | 6 |
| | PUJA VACATION (19.10.2023 to 15.11.2023) | | |
| November 2023 | IFFADSEO3T | Management practices of ornamental fish farms. Common diseases and their control. Conditioning, packing, transport and quarantine methods. | 4 |
| | IFFADSEO3P | Setting up of breeding tank for live bearers, barbs, goldfish, tetras, chichlids, gouramis, fighters and catfishes. Identification of ornamental fish diseases and prophylactic measures. | 6 |
| | IFFACOR12T | Sex determination. Practical application of genetics in aquaculture. Genetics of sex determination in fish. Gonochorism, Hermaphroditism, Protandry, Protogyni, Environmental Influence of Sex Determination. | 10 |
| 1st Week of Dec 2023 | IFFADSEO3T | Trade regulations and wild life act in relation to ornamental fishes. | 2 |
| | IFFADSEO3P | Setting up and maintenance of Aquarium accessories and equipment. Conditioning and packing of ornamental fishes. Preparation of feed. | 4 |
| 3rd Week of Dec 2023 | | Internal Examination & Class for Slow Learners | |
| Jan 2024 | | END SEMESTER EXAMINATION | |
| Total Classes | | | 67 |