

GUJARAT UNIVERSITY
POST GRADUATE DIPLOMA IN
ENTOMOLOGY AND FISHERIES SCIENCE
EFFECTIVE FROM JUNE 2018



**DEPARTMENT OF ZOOLOGY, BIOMEDICAL
TECHNOLOGY AND HUMAN GENETICS**
UNIVERSITY SCHOOL OF SCIENCES
GUJARAT UNIVERSITY
AHMEDABAD – 380 009

Intake : 10 Students

Fees : Rs.15,000/- per Semester

Eligibility : Graduation in Science with any biological sciences including Medical, Dental, Veterinary & Pharmacy.

Admission, Evaluation, Examination , Results & issuing of Certificate will be as per CBCS System, Rules & Regulations of Gujarat University, Ahmedabad.

ENTOMOLOGY AND FISHERIES SCIENCE SYLLABUS FOR CREDIT BASED SEMESTER SYSTEM (CBCS)

NO.	COURSE CODE	NAME OF COURSE	HOURS	CREDITS
1	EFS- 401	ENTOMOLOGY PAPER- 1	3 + 1	4
2	EFS- 402	ENTOMOLOGY PAPER- 2	3 + 1	4
3	EFS- 403	FISHERIES SCIENCE PAPER- 1	3 + 1	4
4	EFS- 404	FISHERIES SCIENCE PAPER-2	3 + 1	4
5	EFS- 405PR	PRACTICAL 1 (Based on Papers EFS 401 and 402)	6	4
6	EFS- 406PR	PRACTICAL 2 (Based on Papers EFS 403 and 404)	6	4
		TOTAL	28	24
1	EFS- 407PT	DISSERTATION AND VIVA-VOCE	20	16
2	EFS- 408S	SEMINARS AND INDUSTRIAL/FIELD VISITS	04	04
3	EFS- 409M	ASSIGNMENTS AND GROUP DISCUSSIONS	04	04
		TOTAL	28	24
		GRAND TOTAL	56	48

SYLLABUS

POST GRADUATION DIPLOMA IN ENTOMOLOGY AND FISHERIES SCIENCE

EFS – 401 ENTOMOLOGY PAPER- 1

- UNIT I:** **General Entomology 1**
Introduction, Insect Morphology
General Anatomy, Excretion, Circulation, Reproduction-development
Lifecycles
- UNIT II:** **General Entomology 2**
Digestion and Nutrition, Neural and Sensory Systems
Insect defences, behaviour,
Pheromones and Bioluminescence
- UNIT III:** **General, Taxonomy and types:**
Evolutionary, Parataxonomy, Numerical, Phylogenetic etc. with reference to
insects etc.
Classification of insects up to Orders and their characteristics
Biodiversity, threats and conservation of insects in Gujarat and its
comparison at national level.
- UNIT IV:** **Insect Ecology**
Ground dwelling insects
Aquatic insects
Social insects
Aerial and plant inhabiting insects

EFS – 402 ENTOMOLOGY - PAPER 2

UNIT I: Commercial and Applied Entomology

Economically important insects
Insects and Plants
Insects: Crop Pests;
Biotechnological control for crop pests
Predators and Parasitoids

UNIT II: Medical, Veterinary and Forensic Entomology

Insect associated pathology
Insect vectors, house pests;
Animal associated parasites
Vertebrate pests

UNIT III: Biological control

Crop pest, Vertebrate Pest management
Insect toxins, Insect chromosomes

UNIT IV: Techniques to study Entomology

Insect collection, Identification
Preservation and dry mount
Liquid preservation, capture,
Storage and handling, temporary care
Indian insect-Repositories
NBS- Indian National Biodiversity Authority Guidelines

EFS - 403 FISHERIES SCIENCE – PAPER 1

Unit 1. Classification of fishes and shellfishes

Criteria for generic and specific identification. Morphological, morphometric and meristic characteristics of taxonomic significance. Major taxa of inland and marine fishes. Commercially important freshwater and marine fishes of India and their morphological characteristics. Study of external morphology and meristic characteristics of Crustacea and Mollusca. Classification of Crustacea and Mollusca with examples of commercially important species.

Unit 2. Inland and marine fisheries

Candidate species of phytoplankton and zoo-plankton as live food organisms of freshwater and marine species. Biology and culture requirements of important live food organisms. Green algae, bluegreen algae, spirulina, diatoms, infusoria, rotifers, cladocerons, tubifex, brine shrimp, chironomids. Cultivable inland and marine fishes and the methods of their culture. Different varieties of exotic and indigenous ornamental fishes and their culture and maintenance. Infectious diseases of cultured fish and shellfish and their treatment strategies.

Unit 3. Capture and processing of fishery products and fishery byproducts

Classification of fishing crafts and gears based on fabrication, dimension, nature of fishing, depth of operation etc. Fishing accessories and deck equipments – types of winches, net haulers, line haulers, triple drum, gurdy, power blocks, fish pumps. Fish finder, GPS navigator, sonar, net sonde, gear monitoring equipments. Refrigeration and freezing technology. Handling of fresh catch and its processing. Canning, thermal processing and packaging. Various fishery byproducts.

Unit 4. Fisheries management and economics

Central and State responsibilities for fisheries development, organizational set up of fisheries administration at the Centre and state levels. Functions and powers of functionaries of department of fisheries, corporations and cooperatives. Different central and state level fisheries institutions. Principles and objectives of co-operation, co-operative movement in fisheries in India, structure, functions, status and problems of fisheries co-operatives management in relation to resources, production and marketing. Fisheries Subsidies and WTO. Fisheries Trade and Environment.

EFS - 404 FISHERIES SCIENCE- PAPER - 2

Unit 1. Nutrition and feed technology:

Principles of fish nutrition, nutritional requirements of cultivable finfish and shellfish: larvae, juveniles and adults. Nutritional value of feed ingredients and live feed; Feed additives (attractants, growth stimulants and probiotics and binders); Feed formulation and processing; On-farm feed manufacture; Commercial feed manufacture; Feed storage.

Unit 2. Fish and shellfish physiology and endocrinology:

Physiology of migration and behaviour, chemical nature of hormones, storage, release and control of hormones; Structure and function of neuro-endocrine system, biotic and abiotic factors influencing homeostasis, endocrine control of growth; Maturation and spawning, spermatogenesis, oogenesis, yolk formation, mechanism of sex reversal; Stress physiology: stress response, stress hormones, stress adaptation.

Unit 3. Advances in fish genetics:

Inheritance of qualitative and quantitative traits in fish; chromosomal polymorphism; Chromosome manipulation: Gynogenesis and androgenesis; production of super-males and transgenic fish; Use of biochemical and molecular genetic markers in hybridization, selective breeding; Chromosome banding techniques; Genotoxicity assay.

Unit 4. Aquatic pollution and wastewater management:

Aquatic pollution – sources, types and their impacts; Pollution problems of groundwater resources – sources of contamination, management issues; Pollutants - sewage, pesticides, oils, metals, radioactive wastes, biomedical wastes, etc.; Common transport processes of pollutants in the aquatic environment; Dispersal of pollutants; Algal blooms and their management; Methods of pollution surveys.

EFS – 405 PR : Practicals based on papers EFS 401 and 402

EFS – 406 PR : Practicals based on papers EFS 403 and 404

EFS – 407PT : Dissertation and Viva – voce

EFS – 408S : Seminars and Industrial visits

EFS – 409M : Assignments and Group Discussions