GOVT.COLLEGEFORWOMEN,PARADEGROUNDJAMMU (AN AUTONOMOUS COLLEGE)

SyllabusandCourseofStudyinZoology –M.Sc.Semester-IV For examinations to be held in 2024-25, 2025-26, 2026-27

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Course No. PSZOTE- 412
CourseTitle:Fish&fisheries
CREDITS: 4
Maximummarks:100
a. MinorTestI:20
b. MinorTestII:20
c. MajorTest:60

Course learning Objectives

The present course on fish and fisheries is, designed to acquaint the students with information on different types of water bodies, their changing physicochemical nature, their influence on inhabiting biota and fish production. This course aims to provide sufficient knowledge regarding life of fishes, their breeding potentials and culturing methods.

Course Learning Outcome:

After completion of the course the students will be able to:
1. Understand the Significance of Fishery Science
2. Comprehend the status of Marine,Riverine and lacustrine fisheries in India.
3. Know about the physiochemical nature of water bodies and their influence on biota
4. Understand the role of Plankton, benthos in fisheries
5. Know about the nutritional requirements of fishes
6. Understand the techniques employed in fish breeding
7. Set up an aquarium
8. Identify diseases in aquarium fishes
9. Know about the efficient fishing techniques

Syllabus

Unit-I Introduction to Fishery science and fisheries of India (12 hrs)

1.1 Importance of Fishery Science
1.2 Role of fisheries sector in India's economic development, fisheries programme and policies
1.3 Capture fisheries of India :
- 1.3.1 Riverine fisheries
- 1.3.2 Lacustrine fisheries
- 1.3.3Major Reservoirs and Reservoirfisheries

1.4 Marine Fisheries
1.5 Culture fisheries:
- 1.5.1 Composite fish culture
- 1.5.2 Air breathing fish culture
- 1.5.3 Prawn culture
- 1.5.4 Pearl culture

Unit-II Fish Environment (13hrs)

2.1 Abiotic
- 2.1.1 Physical characteristics, significance of lotic and lentic water bodies;
  - a.Temperature
  - b.Light
  - c.Turbidity

2.1.2 Chemical characteristics of lotic and lentic water bodies and their significance;

a. DO
b. CO_2
c. pH

2.1.2 Nutrient cycle in lakes (Nitrogen, sulphur and phosphorus)
2.1.3 Thermal stratification in lakes
2.1.4 Causes of aquatic pollution and its impacts

2.2. Biotic

2.2.1. Plankton:Definition,classification and its role in fishery
2.2.2. Benthos:Definition,classification and its role
2.2.3. Eutrophication and level of eutrophication

Unit III Nutritionalrequirements,Biochemical Composition and fish processing(12hrs).

3.1 Nutritional requirements of fish;

3.1.1 Protein
3.1.2 Lipids
3.1.3 Vitamins and Minerals

3.2 Feed formulation,Types and Forms of feed
3.3 Importance of live fish food organism
3.4 Nutritional value of fish
3.5 Fish spoilage and its prevention;Preservation of fish

Unit IV Fish Breeding and Biotechnological Advances (13hrs)

4.1 Natural Breeding of Indian Major carps

4.1.1 Location of breeding grounds and seed collection
4.1.2 Factors responsible for Natural breeding

4.2 Bundh breeding:

4.2.1 Wet bundhs
4.2.2 Dry bundhs
4.2.3 Modern bundhs

4.3 Induced breeding

4.3.1 Stripping
4.3.2 Hypophysation Technique
4.3.3 Factors influencing induce breeding
4.3.4 Modification in the induced breeding system of major carp
4.3.5 Synthetic hormones and its advantages

Unit-V Fishing method / Fish Pathology (12 hrs)

5.1. Marine and inland fishing crafts and gears
5.2. Unconventional fishing methods
5.2.1 Light fishing
5.2.2 Electric fishing
5.2.3 Sonar/ ecosounders

5.3. Fish Diseases:Symptoms,Etiology,Prophylaxis and treatment of

5.3.1 Bacterial:Gill Rot,Pop eye,Furunculosis,
5.3.2 Viral:hemorrhagic septicemia
5.3.3 Fungal diseases:Icthyoponus,Branchiomycoses
5.3.4 Protozoan: Ich, Ichthyophthiriusia

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Note for Paper Setting

ExaminationTheory	Syllabus to be covered in examination	Time allotted for Exam	%weightage (marks)
MinorTest I	upto20%	1 Hr.	20
MinorTest II	21%to40%	1 Hr.	20
MajorTest	41%to100%	2Hrs&30mins.	60

i. Major test will have two sections(A&B)

ii. Section A shall comprise of five (5) multiple choice question of 1 mark each covering the entire syllabus and 5 short answer questions of 2 marks each from the entire syllabus. (A. Sec = 15 marks)

iii. Section B comprises of 6questions (2from each unit) from the remaining 3 units and candidate has to attempt one question from each unit(15marks each).

BooksRecommended

1. JohnE.Bardach, RytherandMcLarney(1972).Aquaculture.TheFarming and Husbandry of Fresh water and marine organisms.
2. C.B.L.Srivastava.(1985).ATextbookofFisheriesScienceandIndianFisheries.
3. Jhingran,V.G.(1997).FishandFisheriesofIndia.HindustanPublishingCorporation,India.
4. Sarkar,S.K.(2002).FreshwaterFishCulture.DayaPubl.House,NewDelhi.
5. AmitaSexana.(2003).AquariumManagement.DayaPubl.House,NewDelhi.
6. Selvamani,B.RandR.K.Mahadevan.(2008).FishHarvestingandProcessing.Campus Books International
7. Jagtap,H.S,S.N.MukherjeeandV.K.Garad.(2009).ATextbookofPisciculture and Aquarium. Daya Publ. House, New Delhi.
8. .J.S.LucasandP.C.Southgate.(2012).Aquaculture:Farming,AquaticAnimalsandPlants. 2 Ed. Wiley Blackwell, U.K.
9. S.S.KhannaandH.R.Singh(2014).ATextbookofFishBiologyandFisheriesofIndia. Hindustan Publishing House.
10. RahulP.Parihar.(2014).FishBiologyandIndianFisheries.
11. HeimoMikkola(2017).Fisheriesandaquacultureinthemodernworld.
12. FrancisDay.TheFishesofIndia.VolumeIandII.London.WilliamDawsonandSonsLtd.
13. Gunther Sterna. FreshWaterFishesof TheWorld. VolumeIandII AFalconBookfrom Cosmo Publications.

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Committee members (External)

1	Prof. (Dr.) Seema Langer Head, Department of Zoology & Dean, Life Sciences, University of Jammu	
2	Dr. N. K. Tripathi, Professor (Retd.) Department of Zoology, University of Jammu	
3	Dr. Surya Partap Singh,Assistant Prof. & Head, Department of Zoology, GDC Basholi	
4	Dr. Shvetambri Jasrotia, Assistant Prof., Department of Zoology, Central University of Jammu	
5	Mr. Munish Sharma Assistant Director Fisheries, Jammu.	
6	Col. (Retd.) Sunil Sambyal ,Biofloc Expert & Entrepreneur	

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LAB COURSE II
Course No. 416

Practicals for Fish & fisheries:

1. Identification of some major carps of food value in your area.
2. Identification of some local minor carps of food value.
3. Methods for determination of: CO_2,DO,pH,Turbidity,light penetration in water.
4. Qualitative analysis of zooplankton in water sample of different water bodies.
5. Qualitative analysis of phytoplankton in water sample of different water bodies.
6. Identification of benthos.
7. To study common bacterial diseases of fishes through specimens or pictures.
8. To study common fungal diseases of fishes through specimens or pictures.
9. To study a few helminth parasites of fishes through slides/specimens/ charts.
10. Methods to preserve fish and avoid spoilage.
11. Identification of various live fish food.
12. Identification of different types and form of fish feed.
13. Identification of different types of ingredient of fish feed.
14. Study of Induced Breeding through videos.
15. Visit to a fish farm.
16. Visit to Trout hatchery.

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