



Karmaveer Bhaurao Patil University, Satara

Syllabus for

B. Sc. I (Fishery Science)

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2026-2027

Syllabus for B.Sc. I (Fishery Science)

Preamble:

The Bachelor of Science (B.Sc.) Programme in Fishery Science is designed in accordance with the National Education Policy (NEP) 2020 and the Curriculum and Credit Framework for Undergraduate Programmes of the University Grants Commission (UGC). The programme provides students with a strong foundation in Fishery Science while incorporating recent developments in biological sciences. It combines theoretical knowledge with practical training to help students understand the diversity of animal life, biological processes, and their importance in nature and society.

The curriculum includes Major, Minor, Open Elective (OE), Ability Enhancement Courses (AEC), Skill Enhancement Courses (SEC), Vocational Skill Courses (VSC), Value Education Courses (VEC), Indian Knowledge System (IKS), laboratory work, field visits, projects, and experiential learning. This multidisciplinary approach enables students to acquire scientific knowledge, technical skills, communication abilities, ethical values, and professional competence.

The programme emphasizes observation, experimentation, critical thinking, scientific inquiry, and problem-solving. It also encourages students to participate in research activities, biodiversity conservation, environmental protection, community engagement, and lifelong learning. The curriculum has been designed to enhance employability, promote entrepreneurship, and prepare students for higher education, research, and various career opportunities in biological sciences and allied fields.

Overall, the programme aims to develop knowledgeable, skilled, responsible, and environmentally conscious graduates who can contribute effectively to scientific advancement and the sustainable development of society.

A. General Objectives of the Programme :

The Bachelor of Science (B.Sc.) programme in Fishery Science aims to :

1. To provide fundamental knowledge of fishery science and its multidisciplinary applications.
2. To develop practical skills in fish identification, aquaculture, aquatic ecology, and laboratory techniques.
3. To promote scientific thinking, analytical ability, and problem-solving skills in fisheries science.
4. To create awareness about aquatic biodiversity, ecosystem conservation, and sustainable fisheries management.
5. To develop competencies in the scientific management of inland, coastal, and marine aquatic resources.

6. To prepare students for higher education, research, innovation, and professional careers in fisheries and allied sciences.
7. To encourage entrepreneurship and self-employment in fisheries, aquaculture, ornamental fish culture, and related sectors.
8. To develop communication, teamwork, leadership, and ethical values for professional practice.
9. To enhance students' ability to apply modern scientific tools and technologies in fisheries and environmental management.
10. To cultivate lifelong learning, environmental responsibility, and social commitment toward sustainable development.

B. Programme Objectives (POs) – B.Sc. Fishery Science

PO1: Fisheries Knowledge

Acquire comprehensive knowledge of fish biology, taxonomy, physiology, aquatic ecology, aquaculture, and fisheries resource management.

PO2: Practical and Technical Skills

Develop laboratory, field, and analytical skills for fish identification, water and soil quality analysis, aquaculture practices, and aquatic ecosystem assessment.

PO3: Sustainable Resource Management

Apply scientific principles for the conservation, sustainable utilization, and management of aquatic resources while maintaining environmental balance.

PO4: Research, Innovation and Entrepreneurship

Develop the ability to conduct scientific investigations, utilize modern technologies, and promote entrepreneurship in fisheries and aquaculture sectors.

PO5: Professional Ethics and Employability

Demonstrate professional ethics, effective communication, teamwork, leadership, and lifelong learning necessary for higher education, research, and employment in fisheries and allied industries.

C. Programme Specific Outcomes (PSOs)

After successful completion of the **B.Sc. Fishery Science Programme**, students will be able to:

PSO1: Identify, classify, and describe freshwater, brackish water, and marine fishes using taxonomic, morphometric, and meristic characters.

PSO2: Explain the structure, functions, physiology, and adaptations of fishes and relate them to aquatic environments.

PSO3: Assess aquatic ecosystems through the analysis of water quality, soil characteristics, plankton diversity, productivity, and ecological interactions.

PSO4: Apply scientific principles and practical techniques in aquaculture, fish farm management, ornamental fish culture, and sustainable fish production.

PSO5: Demonstrate proficiency in laboratory experiments, field surveys, water and soil analysis, fish health management, and data interpretation using standard scientific methods.

PSO6: Evaluate fisheries resources and recommend environmentally sustainable practices for conservation, pollution control, and responsible aquaculture.

PSO7: Demonstrate research aptitude, scientific communication, entrepreneurship, and employability skills required for higher education, fisheries industries, government organizations, and self-employment.

1. **Title:** Fishery Science

2. **Year of Implementation:** The syllabus will be implemented from June, 2024 onwards.

3. **Duration:** The course shall be a full time.

4. **Eligibility:** 12th pass with Science

5. **Teachers qualification :** As per rules and regulations of KBP university, Satara and Govt.of Maharashtra & UGC -

Eligibility of the core faculty- 1) Assistant Professor: Master of Science in Fisheries/ Fishery Science/ Zoology with NET/SET/Ph.D.

6. **Pattern:** Semester examination.

7. **Medium of Instruction:** English.

8. **Course Structure: (NEP2.0)**

Sem (Level)				OE	VSC/ SEC	AEC/ VEC/ IKS	OJT/ FP/ CEP/ CC/ RP	Total Credits	Degree/ Cum. Cr. MEME
	Course I	Course II	Course III						
Sem I (4.5)	DSC I (2)	DSC I (2)	DSC I (2)	OE I (2) (P)	-	IKS I (2) (Generic)	-	22	UG Certificate: 44
	DSC II (2)	DSC II (2)	DSC II (2)						
	DSC P I (2)	DSC P I (2)	DSC P I (2)						
Sem II (4.5)	DSC III (2)	DSC III (2)	DSC III (2)	OE II (2)	-	VEC I (2)	-	22	
	DSC IV (2)	DSC IV (2)	DSC IV (2)			DEGG and IIC			
	DSC P II (2)	DSC P II (2)	DSC P II (2)						
Credits	12	12	12	4	-	4	-	44	Exit option: 4 Cr. NSQF/Intern ship/Skill Courses

Level 4.5, Semester I

Course Title	Theory			Practical		
	Course Code	Credits	Lectures Per Week	Course Code	Credits	Lectures Per Week
Fish Taxonomy and Identification	BFT 111	2	4	BFP 113	4	4
Fish Anatomy and Physiology	BFT 112	2				
Instrumentation Studies (OE-I)	--	--	--	BFPOE1	2	2
Introduction to Indian Knowledge System (IKS)	BFTIKS1	2	2			

Level 4.5, Semester II

Course Title	Theory			Practical		
	Course Code	Credits	Lectures Per Week	Course Code	Credits	Lectures Per Week
Aquatic Ecology	BFT 121	2	4	BFP 123	2	4
Aquaculture	BFT 122	2				
Instrumentation Studies (OE-II)	--	--	-	BFPOE2	2	2
Democracy, Election and Indian Constitution (VEC)	BFTVEC1	2	2	--	--	--

**OE= Open Elective, SEC: Skill Enhancement Course ,
IKS: Indian Knowledge System , VEC: Value Education Course**

Evaluation Structure Semester - I

Course Name	Course Code	Internal Evaluation (Best of Two CCE)			ESE	Total Marks	Credits
		CCE-I	CCE-II	CCE-III			
Fish Taxonomy and Identification	BFT 111	10	10	10	30	50	2
Fish Anatomy and Physiology	BFT 112	10	10	10	30	50	2
Practical Course – I	BFP 113	20			30	50	2

Semester – II

Course Name	Course	Internal Evaluation (Best of Two CCE)			ESE	Total Marks	Credits
		CCE-I	CCE-II	CCE-III			
Aquatic Ecology	BFT 121	10	10	10	30	50	2
Aquaculture	BFT 122	10	10	10	30	50	2
Practical Course – II	BFP 123	20			30	50	2



Karmaveer Bhaurao Patil University, Satara

Syllabus for

B. Sc. I (Fishery Science)

Semester I

Under

Faculty of Science and Technology

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With effect from Academic Year 2026-2027

	Karmaveer Bhaurao Patil University, Satara (A State Public University Est. u/s 3(6) of MPUA 2016) Faculty of Science and Technology	
	Yashavantrao Chavan Institute Of Science, Satara	
	Board of Studies in Zoology	
	Programme: B.Sc.I	Semester - I
	Type : Major	Marks: 50
	Credits : 02 (30 hrs)	From: A. Y. 2025-26
Name of the Course: BFT-111 Fish Taxonomy and Identification		
Course Objectives: By the end of the course, students should be able to: 1. Recognize the scope, importance, and diversity of fishes. 2. Illustrate the structural features and external adaptations of fishes. 3. Develop skills in fish identification using morphometric and meristic characters. 4. Examine the principles of fish age determination and growth analysis.		
Course Outcomes: By the end of the course, students will be able to: 1. Outline the classification and distinguishing characteristics of fishes. 2. Compare the external features of Teleost and Elasmobranch fishes. 3. Measure morphometric and meristic characters for fish identification. 4. Estimate fish age and evaluate growth using standard methods.		
Module	Title and Contents	Hrs
Module -1:	Scope, Importance of fisheries and general characters of fishes 1.1 Introduction, definition, scope and importance of fishery science. 1.2. Classification of fish and shell fishes up to class level 1.3. External characters of Teleost and Elasmobranch 1.4. Difference between Teleost and Elasmobranch fishes.	08
Module -2:	Fins, age and growth 2 .1.Different types of fins and their functions. 2.2. Age and Growth: a. Methods of determination of age; Methods for studying growth b. Length-Weight relationship and Condition factor.	08
Module -3:	Fish identification technique 3.1. Study of morphometric characters in fishes. 3.2. Study of meristic characters in fishes	06
Module -4:	Skin, Scales and Colouration in fishes 4.1. Structure and functions of skin in fishes. 4.2. Study of different types of scales in fishes. 4.3. Colouration in fishes – Source of colour, colour changes in fishes, significance of colour changes.	08

Reference Books:-

- 1.Sharma, A. and Jyoti M. K. (2016). Fishes: Aid to collection and identification. Daya Publishing House, New Delhi 1st. ed.
- 2.Kar. Devashish (2013). Essentials of Fish Biology, dominant publishers and distributors(p) Ltd, Delhi.
3. Kar. Devashish (2012). Taxonomy, APH Publishing Corporation, Ansari Road, Darya Ganj, New Delhi
4. Biswas K. P. (2011). Marine prawns and shrimps. Daya Publishing House, New Delhi.
5. Dholakia, A. D. (2011). Identification of marine and fresh water mollusc shells. Daya Publishing House, New Delhi
6. Dholakia, A. D. (2010). Identification of prawns/shrimps and their culture. Daya Publishing House, New Delhi.
7. Sandhu, G. S. (2005). A Text book of Fish and Fisheries. Daya Publishing House, New Delhi.
8. Khanna. S. S. and Singh. H. R. (2005). A Textbook of Fish Biology and Fisheries, Narendra Publishing House, Delhi.
9. Parihar, R. P. (2004). A Text book of Fish Biology and Indian Fisheries. Central Publishing House, Allahabad
10. Norman, J. R. (2002). A history of fishes: a complete known account of fishes. Asiatic publishing house, Delhi.
11. Jayram, K. C. (2002). The fresh water fishes of India, A hand book. Zoological Survey of India.
12. Yadav, B. N. (2002). Fish and Fisheries, 2nd revised and enlarged edn. Daya Publishing House, Delhi .
13. Lagler, K. F. (1981). Fresh Water Fishery Biology. (2nd edition). W. M. C. Brown Company Publishers, Dubugur, IOWA.

Evaluation Pattern :**Total Marks : 20/30****Internal Examination: 20 marks
(Best out of two CCE)****CCE- I: 10 Marks****CCE- II: 10 Marks****CCE- III: 10 Marks****End Semester Examination : 30 marks****Question-1****Question -2****Question -3**

	Karmaveer Bhaurao Patil University, Satara (A State Public University Est. u/s 3(6) of MPUA 2016) Faculty of Science and Technology	
	Yashavantrao Chavan Institute Of Science, Satara	
	Board of Studies in Zoology	
	Programme: B.Sc.I	Semester - I
	Type : Major	Marks: 50
	Credits : 02 (30 hrs)	From: A. Y. 2025-26
Name of the Course BFT 112 : Fish Anatomy and Physiology		

Course Objectives: By the end of the course, students should be able to:

1. Understand the morphology and digestive adaptations of fishes.
2. Explain the structure and functions of major organ systems in fishes.
3. Illustrate the physiological processes involved in respiration, circulation, excretion, and reproduction.
4. Examine the nervous system and sensory organs of fishes and their functional significance.

Course Outcomes: By the end of the course, students will be able to:

1. Describe the external morphology, feeding adaptations, and digestive system of fishes.
2. Explain the structure and functions of the respiratory and circulatory systems
3. Interpret the physiological mechanisms of excretion, osmoregulation, and reproduction in fishes.
4. Differentiate the nervous system and sensory organs based on their structure and functions.

Module	Title and Contents	Hrs
Module -1:	External Characters of Fishes and Digestive system 1.1. Body forms in fishes 1.2. Different types of mouth 1.3 Teeth and Gill Rakers: structure, types, function and modifications. 1.4. Food: Types of food and feeding habits. 1.5 Digestive System – Coelom and Alimentary canal, Associated glands –Liver, Pancreas, Gall bladder, Physiology of digestion.	08
Module -2:	Respiratory and Circulatory system 2.1. Respiratory system – Structure and functions of gills and physiology of Respiration. 2.2. Circulatory System : Structure and working of heart, Composition of blood. 2.3. Hepatic portal system.	06
Module -3:	Excretory and Reproductive system 3.1 Excretory system – Types, structure and functions of kidney, Physiology of excretion 3.2. Osmoregulation in fishes 3.3. Reproductive system: Male and female reproductive organs, maturation and spawning. 3.4. Modes of reproduction in fishes	08
Module -4:	Nervous system and Sense organs: 4.1. Nervous system – Structure of brain and spinal cord , Sense organs 4.2. Lateral line and neuromast organs 4.3. Internal ear (membranous labyrinth) - Structure and functions. 4.4. Olfactory organs - Structure and functions. 4.5. Photoreceptor organ (eye) : Structure and functions.	08

Reference Books:-

1. Khanna S. S and Kapoor N. (2019): An Introduction to fishes. Surjeet Publications. Central Book Depot, Allahabad.
2. Pandey A. K and Sandhu G.S (2014): Encyclopedia of fishes and fisheries of India Vol. I and IV, Amol Publication, New Delhi.
3. Khanna S. S and H. R. Singh (2003): A text book of fish biology and fisheries, Narendra Publishing House, New Delhi.
4. Jobling, M. (1995). Environmmetal biology of fishes, Chapman and Ha Joachim W. Hertrampf.
5. King, M.,(1995). Fisheries Biology, Assessment and Management. Fish News Book, Blackwell Science, Inc. Cambridge, MA.
6. Jhingran. V G. (1991). Fish and Fisheries of India, Hindustan Publishers.
7. Lagler, K.P. Berdach, J.C. Miller, R.R and Passion M., D.R.(1977). Ichthyology. John Wiley and sons inc. Newyork.
8. Matty, A.J. (1985). Fish endocrinology (Croom Helm, Ltd. U.S.A. 267 p 23.
9. Mcvey J.P., (1983): Handbook of Mariculture, CRC press, Florida
10. Norman J. R: A. (1963) of Fishes. Earnest Benn. Ltd. London. Second Edition

Evaluation Pattern :**Total Marks : 20/30****Internal Examination: 20 marks****CCE- I: 10 Marks****CCE- II: 10 Marks****CCE- III: 10 Marks****End Semester Examination : 30 marks****Question-1****Question -2****Question -3**



Karmaveer Bhaurao Patil University, Satara

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Faculty of Science and Technology

Yashavantrao Chavan Institute Of Science, Satara

Board of Studies in Zoology

Programme: B.Sc.I

Semester - I

Type : Major

Marks:50

Credits :02 (60 hrs)

From: A. Y. 2026-27

Name of the Course: BFP 113: Practical's based on BFT 111 and 112

Course Objectives: By the end of the course, students Should be able to...

1. Identify and classify fishes and other aquatic animals using taxonomic characters.
2. Examine the external and internal morphology of fishes.
3. Apply morphometric techniques for fish identification and assessment.
4. Demonstrate practical skills through field visits and laboratory investigations.

Course Outcomes: By the end of the course, students will be able to....

1. Classify major freshwater, marine, and other aquatic animals based on diagnostic characters.
2. Differentiate the morphological and anatomical features of fishes.
3. Measure morphometric characters and interpret length–weight relationships in fishes.
4. Demonstrate taxonomic and laboratory skills through field visits and specimen-based studies.

Sr.no.	List of Experiments	Hrs
1.	Identification and classification of fresh water fishes- <i>Catla catla</i> , <i>Labeo rohita</i> , <i>Cirrhina mrigala</i> , <i>Clarius batrachus</i> , Eel fish	60
2.	Identification and classification of marine water fish- <i>Scoliodon</i> , <i>Harpadon</i> , <i>Hippocampus</i> , <i>Pristis</i> , <i>Exocoetus</i>	
3.	Identification and classification of other aquatic animals- <i>Palaemon</i> , <i>Penaeus</i> , <i>Mytilus</i> , <i>Pila</i> , <i>Sepia</i> , Pearl oyster	
4.	Study of Morphometric measurements of Chondrichthyes fishes.	
5.	Study of Morphometric measurements of Osteichthyes fishes	
6.	Study of different types of fins – Paired and Unpaired fins	
7.	Temporary mounting of scales- Placoid, Cycloid and Ctenoid Scales	
8.	To Study colouration in Fishes	
9.	Demonstration-Any locally available bony fish a) Digestive system b) Respiratory system- Gills and accessory respiratory organs.	
10.	Demonstration- Any locally available bony fish c) Heart, Afferent and Efferent Branchial Vessels. d) Brain	
11.	Demonstration-Any locally available bony fish e) Sexual Dimorphism in fishes f) Male and Female Reproductive System	
12.	Study of different types of mouth in fishes.	
13.	To study Length-Weight relationship in fishes.	
14.	Survey on Fish morphometry	
15.	Project: Visit to fish market/ visit to fish seed	

Reference Books:-

1. Khanna S. S (2019). An Introduction to fishes. Central Book Depot, Allahabad
2. Pandey A. K and Sandhu G.S (2014). Encyclopedia of fishes and fisheries of India Vol. I and IV, Amol Publication, New Delhi
3. Walker P and Subasinghe RP. (Eds.). (2005). Principal Diseases of Marine Fish and Shell fish. Vols. I, II. 2nd Ed. Academic Press.
4. Shankar KM and Mohan CV. (2002). Fish and Shellfish Health Management. UNESCO Publ.
5. Khanna S. S and H. R. Singh (2003). A text book of fish biology and fisheries, Narendra Publishing House, New Delhi
6. Tandon KK and Johal MS (1996). Age and Growth in Indian Fresh Water Fishes. Narendra Publishing House, New Delhi.
7. Sargent, J. Henderson, R. J. and Tocher, D. R., (1989). The lipids. in Fish Nutrition, pp 153-218. Edited by J.E. Halver, Academic Press, Inc.
8. Norman J. R: A.(1965): History of Fishes. Earnest Benn. Ltd. London.

Evaluation Pattern:**Total Marks: 20/30****Internal Examination: 20 marks**

(Student performance ,attendance, journal records and viva voce)

End Semester Examination : 30 marks

Question-1

Question -2

Question -3



Karmaveer Bhaurao Patil University, Satara

Syllabus for

B. Sc. I (Fishery Science)

Semester II

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2026-2027



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(A State Public University Est. u/s 3(6) of MPUA 2016)

Faculty of Science and Technology

Yashavantrao Chavan Institute Of Science, Satara

Board of Studies in Zoology

Programme: B.Sc.I

Semester - II

Type : Major

Marks:50

Credits : 02 (30 hrs)

From: A. Y. 2026-27

Name of the Course: BFT 121 : Aquatic Ecology

Course Objectives: By the end of the course, students should be able to...

1. Understand the diversity, structure, and functioning of aquatic ecosystems.
2. Explain the influence of physico-chemical parameters on aquatic environments.
3. Analyze trophic dynamics, energy flow, and productivity in aquatic ecosystems.
4. Evaluate the causes, impacts, and control measures of aquatic pollution.

Course Outcomes: By the end of the course, students will be able to:

1. Define the diversity, components, and ecological interactions of aquatic ecosystems.
2. Describe the role of physico-chemical characteristics in maintaining aquatic ecosystems.
3. Investigate trophic relationships, energy flow, and primary productivity in aquatic habitats.
4. Assess aquatic pollution, bioindicator species, and suitable pollution control measures.

Module	Title and Contents	Hrs
Module -1:	Aquatic Ecosystem: 1.1 Diversity and composition of aquatic ecosystems (fresh water, marine and estuarine). 1.2 Ecological differences between lentic and lotic environments. 1.3 Aquatic environment, Flora and fauna: Components of aquatic systems, 1.4 Animal associations: Symbiosis, commensalisms, parasitism, prey-predator relationship, host parasite relationship.	08
Module -2:	Physico-Chemical Characteristics 2.1. Physical Characteristics of Water: Light, Salinity 2.2. Tides and Currents, 2.3. Chemical Characteristics of Water: pH, dissolved oxygen, free carbon dioxide, hardness, alkalinity, conductivity, suspended and dissolved solids.	06
Module -3:	Trophic Dynamics 3.1.Trophic Dynamics in aquatic ecosystem: 3.2. Food chains, pyramids , nutrient cycles and energy flow 3.3. Trophic relationship in lentic and lotic biotopes. 3.4. Basic concepts of primary productivity	08
Module -4:	Aquatic Pollution: 4.1. Aquatic pollution and its types (biological, chemical, thermal and industrial), 4.2. Eutrophication: Causative factors, consequences and control. 4.3. Impact of water pollution on aquatic communities and its control measures. 4.4. Bio-indicator species	08

Reference Books:-

- 1.Das.B and Kar. Devashish (2012). Basic Limnology and Fish Biodiversity, Manglam publishers and Distributors, Delhi
- 2.Sakhare, V. B. (2011). Limnology: current perspectives. Daya Publishing House, Delhi.
- 3.Vijaykumar K. and vasanthkumar, B. (2010). Aquatic ecosystem and its management. Daya Publishing House, Delhi.
- 4.Kosygin, L (2009). Wetlands of North east India. Akansha publishing house, New Delhi
- 5.Sakhare, V. B. (2007). Reservoir Fisheries and Limnology. Daya Publishing House, Delhi.
- 6.Kar. Devashish;(2007). Fundamentals of Limnology and Aquaculture Biotechnology, Daya Publishing House, Delhi.
- 7.Kumar Arvind. (2008). Aquatic environment and toxicology. Daya Publishing House, Delhi.
- 8.Alex, M. and Theresa, A. (1998). Environmental Management of Aquaculture (Fish edition), Chapman & Hall, London.
- 9.Basheer, A. (1989). Marine Biology: Some Aspects of Marine Ecology and Marine Fisheries. Daya Publishing House, Delhi.
- 10.Boyd, C. E. and Tucker, C. S. (1998). Pond Aquaculture Water Quality Management. Kluwer Academic Publishers.
- 11.Santhanam R, Velayatham and Jegathersan P.G. (1990). A Mannual of Fresh Water Ecology. Daya Publishing House, Delhi.
- 12.Schowerbel, J. and Hemmings, B. (1991). Hand Book of Limnology. Scientific Publishers, Jodhpur.

Evaluation Pattern :**Total Marks : 20/30****Internal Examination:**

CCE- I: 10 Marks
CCE- II: 10 Marks
CCE- III: 10 Marks

End Semester Examination : Total - 30 Marks

Question-1
Question -2
Question -3

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	Yashavantrao Chavan Institute Of Science, Satara	
	Board of Studies in Zoology	
	Programme: B.Sc.I	Semester - II
	Type : Major	Marks:50
	Credits : 02 (30 hrs)	From: A. Y. 2026-27
Name of the Course: BFT 122 : Aquaculture		
Course Objectives: By the end of the course, students should be able to... 1. Understand the fundamentals and culture systems of aquaculture. 2. Illustrate the principles of fish farm planning and construction. 3. Apply scientific techniques for fish pond management and production. 4. Analyze ornamental fish culture, aquarium management, and market potential.		
Course Outcomes: By the end of the course, students will be able to: 1. Explain the concepts, scope, and culture systems of aquaculture. 2. Design a basic fish farm based on site selection and species requirements. 3. Apply pond management practices to enhance fish production. 4. Demonstrate the principles of ornamental fish culture, aquarium maintenance, and export opportunities.		
Module	Title and Contents	Hrs
Module -1:	Introduction to Aquaculture: 1.1 Basics of aquaculture, definition and scope 1.2 Concepts and history of aquaculture. 1.3 Systems of aquaculture: Monoculture, polyculture and integrated culture systems. 1.4 Difference between culture and capture fisheries. 1.5 Types of aquaculture-Freshwater, Brackish water, Marine water 1.6 Extensive, semi-intensive, intensive and super intensive aquaculture	08
Module -2:	Fish Farm Construction 2.1. Lay out of fish farm 2.2. Criteria of site selection, soil and water characteristics. 2.3. Construction of fish farm: Nursery, rearing and stocking ponds. 2.4. Criteria for selection of candidate species for aquaculture. 2.5. Major candidate species for aquaculture.	06
Module -3:	Fish Farm Maintenance 3.1. Pond preparation, fertilization, liming, species selection, stocking density, feeding and harvesting. 3.2. Water and soil quality in relation to fish production. 3.3. Physical, chemical and biological factors affecting productivity of ponds. 3.4. Aquatic weeds and their control. 3.5. Effect of algal bloom, predatory insects, weeds fishes and their control	08
Module -4:	Ornamental fishes and aquarium maintenance 4.1. Different varieties of exotic and indigenous fishes. 4.2. Principles of a balanced aquarium. 4.3. Water quality management. Aquarium plants and their propagation methods.	08

	4.4.Aquarium fish feeds-Dry, wet and live feeds. 4.5.World trade of ornamental fish and export potential	
Reference Books:- 1. Kumar, A. and Bandyopadhyay, P. (2008). Aquaculture and Fisheries. Daya Publishing House, Delhi. 2. Pandey, N. and Malik, D. S. (2008). Integrated Fish Farming. Daya Publishing House, Delhi. 3. Jhingran, V. G. (2007). Fish and Fisheries of India. Hindustan Publishing Corporation (India) New Delhi 4. Ahmed, S. H. (1998). Advance in Fisheries and Fish production. Narendra Publishing House, Allahabad. 5. Desilva, S. and Andensan, T. A. (1995). Fish Nutrition in Aquaculture. Chapman & Hall. 6. Chakroff, M. (1982): Freshwater Fish Pond Culture and Management. Scientific Publishers Main Bhawan, Jodhpur. 7. Sharma, U. and Grover, S. P. (1982). An Introduction to Indian Fisheries. Bishensing Mahendrapal Singh, Dehra Dun. 8. Tilak, R. and Sharma, U. (1982). Game Fishes of India and Angling. International Book Distributors, Dehra Dun. 9. Timmernams, J. A. and Khan, H. (1979). Textbook of Fish culture, Breeding and Cultivation of fish. Fishing New Book Ltd. England.		
Evaluation Pattern :		
Total Marks : 20/30		
Internal Examination: 20 marks	End Semester Examination : 30 Marks	
CCE- I: 10 Marks	Question-1	
CCE- II: 10 Marks	Question -2	
CCE- III: 10 Marks	Question -3	



Karmaveer Bhaurao Patil University, Satara

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Faculty of Science and Technology

Yashavantrao Chavan Institute Of Science, Satara

Board of Studies in Zoology

Programme: B.Sc.I

Semester - II

Type : Major

Marks:50

Credits :02 (60 hrs)

From: A. Y. 2026-27

Name of the Course: BFP 123: Practical's based on BFT 121 and 122

Course Objectives: By the end of the course, students Should be able to...

1. Understand aquatic organisms, ornamental fishes, plankton, and live food organisms.
2. Develop skills in water and soil quality analysis using standard laboratory techniques.
3. Apply methods for assessing aquatic productivity and managing aquatic resources.
4. Demonstrate field and laboratory techniques relevant to aquaculture and aquatic ecosystem studies.

Course Outcomes: By the end of the course, students will be able to....

1. Identify fishes, plankton, aquatic weeds, and other aquatic organisms from different habitats.
2. Perform water and soil quality analyses using standard procedures.
3. Determine primary productivity and evaluate live food organisms for aquaculture.
4. Apply practical skills in aquaculture resource management through laboratory and field studies.

Sr.no.	List of Experiments	Hrs
1.	Identification of Fishes from different Habitat. a) Fresh water habitat (Any 2) , b) Brackish water habitat – (Any 2) , c) Marine water habitat -(Any 2)	60
2.	Identification of ornamental fish	
3.	Determination of primary productivity	
4.	Study of planktons	
5.	Water Analysis : collection and preservation of water samples. transparency, turbidity, determination of pH, electrical conductivity, salinity, chlorinity	
6.	To Study total solids (TDS, TSS, TVS, TVDS)	
7.	To Estimation of dissolved oxygen from any given water sample	
8.	Estimation of total alkalinity from any given water sample	
9.	Estimation of free carbon dioxide from given water sample	
10.	Estimation of total hardness from given water sample	
11.	Soil analysis: Determination of soil texture, soil pH, conductivity, soil available nitrogen	
12.	Soil analysis: Determination soil available phosphorus and organic carbon	
13.	Collection, identification and control of aquatic weeds, insects, predatory fishes, weed fishes and eggs and larval forms of fishes	
14.	Methods of collection and identification of different live food organisms. Evaluation of live food organisms	
15.	Visit to Aquaculture / any suitable place	

Reference Books:-

1. Khanna S. S (2019). An Introduction to fishes. Central Book Depot, Allahabad
2. Pandey A. K and Sandhu G.S (2014). Encyclopedia of fishes and fisheries of India

Vol. I and IV, Amol Publication, New Delhi

3. Walker P and Subasinghe RP. (Eds.). (2005). Principal Diseases of Marine Fish and Shell fish. Vols. I, II. 2nd Ed. Academic Press.
4. Shankar KM and Mohan CV. (2002). Fish and Shellfish Health Management. UNESCO Publ.
5. Khanna S. S and H. R. Singh (2003). A text book of fish biology and fisheries, Narendra Publishing House, New Delhi
6. Tandon KK and Johal MS (1996). Age and Growth in Indian Fresh Water Fishes. Narendra Publishing House, New Delhi.
7. Sargent, J. Henderson, R. J. and Tocher, D. R., (1989). The lipids. in Fish Nutrition, pp 153-218. Edited by J.E. Halver, Academic Press, Inc.
8. Norman J. R: A.(1965): History of Fishes. Earnest Benn. Ltd. London.

Evaluation Pattern:

Total Marks: 20/30

Internal Examination: 20 marks

(Student performance ,attendance, journal records and viva voce)

End Semester Examination : 30 marks

Question-1

Question -2

Question -3

