

**SWAMI RAMANAND TEERTH MARATHWADA
UNIVERSITY, NANDED**

SYLLABUS EFFECTIVE FROM JUNE - 2013

B. Sc Third Year Vth Semester

Subject: - Fishery Science

Theory Paper - XII Indian Fisheries and Mericulture.

Marks 50

Unit - I

Study of marine fisheries and classification, external feature distribution, food & feeding, reproduction of important fishes of the following:

- 1) Sardine fishery.
- 2) Bombay duck fishery.
- 3) Mackerel fishery.
- 4) sole fishery

Unit – II

- 1) Hilsa fishery.
- 2) Pomfret fishery.
- 3) Mollusk fishery, (Cephalopod, Chanks).
- 4) Prawn fishery.

Unit - III

1) Mericulture:-

- 1) Prawn Culture.
- 2) Mussel Culture (Edible oyster)
- 3) Pearl oyster culture.
- 4) Seaweed culture.

Unit - IV

Important lakes and Estuarine fisheries of India

- 1) Hooghly-Matla estuary
- 2) Chilka lake
- 3) Pulicat lake
- 4) Kolleru lake .

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B. Sc Third Year V Semester

Subject: - Fishery Science

Theory Paper – XIII

Aquaculture Technique and Fish Nutrition

Marks: 50

Unit – I

Fish culture :

1. Culture of Indian major carps.
2. Culture of air –breathing fishes.
3. Culture of milk fish – chanos chanos.
4. Culture of sea bass.
5. Culture of crabs.

Unit - II

Marine water prawn culture :

1. Study of general characteristics.
2. Food and feeding.
3. Selection of site.
4. Collection of broods.
5. Mating and spawning.
6. Development.
7. Water quality for culture.
8. Prawn rearing.
9. Larval food supply.
10. Methods of fishing.

Unit- III

Fish Nutrition :

- 1) Ingredients for fish feed.

- i) Mill - by – Products.
 - ii) Oil extractives.
 - iii) Animal by- products.
 - iv) Miscellaneous.
- 2) Fish feed formulation.
- i) Balancing crude protein level.
 - ii) Steps in feed formulation.
 - iii) Best-by techniques.
 - iv) Storage and distribution.

Unit- IV

Aquaculture and Probiotics

- 1) Introduction and Defination.
- 2) History of probiotics.
- 3) Selection criteria for probiotics
- 4) Compositon and dosages.
- 5) Potential of probiotics
 - i) Pathogen inhibition
 - ii) Growth promoters
 - iii) Water quality maintenance
- 6) Overall significance of probiotics in aquaculture.

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UNIVERSITY, NANDED SYLLABUS EFFECTIVE FROM JUNE - 2013

B. Sc Third year VI Semester

Subject: - Fishery Science

Theory Paper – XIV

Aquarium keeping and Fish Genetics

Mark 50

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Unit - I

Fish Aquarium

- 1) Introduction
- 2) Types of aquarium.
- 3) Importance of aquarium.
- 4) Accessories of aquarium.
- 5) Aquarium fabrication.
- 6) Setting of aquarium.

Unit – II

- 1) Care and maintenance of aquarium.
- 2) Aquarium water quality and management.
- 3) Aquarium fishes.
- 4) Aquarium plants.
- 5) Food for Aquarium fishes.
- 6) Aquarium fish diseases and their control.
- 7) Breeding technique of ornamental fishes.

Unit - III

Fish Genetics :

- 1) Introduction
- 2) Fish genetic (germ plasm) resources.
- 3) Application to genetic approach to fisheries management.
 - a) Capture fishery management
 - b) Fish culture management.

- 4) Cryopreservation of gamete
 - a) Gene banking
 - b) Cryopreservation technique for sperm..
- 5) Sterile fish.

Unit IV

Biotechnology and aquaculture.

- A) Genetic engineering method
 - a)Genomic manipulation
 - i) Indirect manipulation:- Intraspecific hybridization, Inetrspecific hybridization, Intergenic hybridization,
 - ii) Direct manipulation:- Gynogenesis, Androgenesis, Polyploidy.
 - b) Gene Transfer Sex reversal
- B) Transgenic fishes, Inbreeding, Cross breeding, selective breeding.

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SYLLABUS EFFECTIVE FROM JUNE - 2013

B. Sc Third year VI Semester

Subject: - Fishery Science

Theory Paper – XV

Fish Economics, Marketing , Cooperative and Extension Mark

50

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Unit – I

Fish economics :

- i) Definations and principals of fisheries economics.
- ii) Terms in economics.
- iii) Demand.
- iv) Supply.
- v) Cost.

Unit – II

Fish Marketing :

- i) Introduction and definition.
- ii) Characteristics of fish marketing.
- iii) Types of marketing :
 - i) Traditional fish market.
 - ii) Modern fish market.
- iv) Types of distribution channel :
 - i) Direct distribution channel.
 - ii) Indirect distribution channel.
- v) Marketing functions:
 - i) Functions of exchange.
 - ii) Functions of physical supply.

iii) Facilitating functions.

vi) Price structure and problems in fish marketing.

Unit – III

Fish Co-operatives :

i) Definitions and principals of co-operative societies.

ii) History of co-operatives movements in India.

iii) Organs of co-operatives

i) President ii) vice-presidents iii) Directors iv) Members

v) Treasurer vi) Auditors vii) Types of meetings

iv) Structure of fisheries co-operative society.

i) Primary co-operative ii) Regional federation

iii) State level federation iv) National federation

v) Function of fishermen co-operative society

vi) Problems of fishermen co-operative society and their remedial measures.

Unit – IV

Fisheries extension :

i) Governments policies

ii) Plans and programmes

iii) Funding , Training and mass media

iv) Socioeconomics condition of fishermen

v) Role of FFDA

vi) Role of remote sensing

i) Direct methods

ii) indirect methods

vii) Exclusive economic zone (EEZ)

viii) Fisheries institutions of India

i) Central marine fisheries Research institute – CMFRI

- ii) Central institute of fisheries Technology – CIFT
- iii) Central institute of fisheries Education – CIFE
- iv) Central institute of freshwater Aquaculture – CIFA
- v) Fisheries survey of India - FSI
- vi) National institute for oceanography - NIO

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SYLLABUS EFFECTIVE FROM JUNE - 2013

B. Sc III Year Semester V&VI

Fishery Science

Practical Paper – XVI

50 Marks

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1] Study of cultivable fishes

Labeo ,Catla, Cirrhina, Chanos chanos, Sea bass, Clarius, Anabus,
Channa, Heteropneustes fossilis

2] Non fish organisms - P. indicus , P.monodon, Crab

3] Study of phytoplankton and zooplanktons(Any 5)

4] Study of locally available feed ingredients (Any 5)

5] Formulation of fish feed

6] Estimation of crude protein from feed ingredients and feed.

7] Estimation of lipid from feed ingredients and feed.

8] Estimation of carbohydrate from feed ingredients and feed.

9] Estimation of vitamin from feed ingredients and feed.

10] Collection and submission of locally available feed ingredients.

11] Submission of prepared fish feed.

12] Calculate per hector income of fish production from given data.

13] Visit to fisheries co-operative society/ Fish market

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B. Sc III Year Semester V&VI.

Fishery Science.

Practical Paper – XVII.

Mark 50

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- 1] Identification, classification and commercial importance of following fishes.
 - 1) Sardine 2) Mackerel 3) Bombay duck 4) Sole fish 5) Pomfreet
 - 6) Ribbon fish 7) Hilsa 8) Mugil
- 2] Identification, classification and commercial importance of following Non fish organisms
 - 1) Peanus indices 2) Peanus Monodon 3) Edible oyster 4) Pearl oyster
 - 5) Sepia 6) Loligo 7) Chunks. 8) Mytilus
- 3] Study of fishing crafts and gears (Five each)
- 4] Identification penaeid and non penaeid prawns with sex.
- 5] Identify and describe the aquarium accessories with their use and maintains. (any five).
- 6] Preparation of an aquarium tank of suitable size.
- 7] Setting of aquarium.
- 8] Maintenance of an aquarium.
- 9] Identify classify and describe aquarium fishes (any five).
- 10] Identify and describe an aquarium plants (any five).
- 11] Isolation and estimation of DNA from any locally available fish
- 12] Preparation of Project and submission of report on any one aspect.

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SYLLABUS EFFECTIVE FROM JUNE - 2013

B. Sc V & VI Semester

Subject :- Fishery Science

List of Reference Book Theory Paper :-XII, XIII, XIV & XV

Marine fisheries : Dr. Bal & K. Virbhadrarao.

Fishery science and Indian fisheries : C.B.L. Shrivastav.

The Economic of Fisheries management : Anderoson L 1977 & John Hapkins.

Fish economic : P.S. Rao

Fishery economic and Introduction : Cuningan Dunn whit Masesh, Marshall st. Martins.

Marketing management : Kothar P 1988 prentice Halt.

Extension Education : Adivia Reddy & Bapatlal.

Aquaculture Extension: Gibbons M.J. & R. Shrider 1983 peace cons. Information collection
Exchange manual M 18.

A Text book of aquaculture : M.Srinivasulu Reddy, K.R.S. Sambasiva Rao.) A Text book of
Fish Fisheries and Technology : K.P.Biswas

Hand Book of fish aquarium : Dr.C.J.Hiware,Dr.(Mrs.) S.R.Sonawane.

Aquaculture and aquarium keeping: S.P.Chavan,M.S.Kadam,S.D.Niture.

. Fish Feed Technology : ADCP/REP/80/11 FAO (1980)

The Nutrition And Feeding Of Farmed Fish And Shrimp : A Training Manual Feeding
Methods. FAO (1980)

Nutrition and Feeding of Fish: Kluwere Academic Publication -Tom Lovell (1998)

Fish Genetics: Sangita Malvee(2008) : SBS, Publishers & Distributors

Applied fish genetics : Fishing Chimes, Bhaja Krishna Padhi, Radha Kanta Mandal.

Probiotics and Health Claims : Wolfgang Kneifel, Seppo Salminen (2010)

The Use of Probiotics in Fish Hatcheries: Results and Prospect : F.J. Gatesoupe (1991)

Direct-Fed Microbials and Prebiotics for Animals: Todd R. Callaway, Steven C. Ricke (2011)

Probiotics Applications and Practical Aspects : Fuller , R.(1997)

Economics for Fisheries Management : Quentin Grafton, R.(2006)

Fisheries economics : Volume 1, Part 1 United States. National Technical Information Service:
Robena J Brown, (1980)

Fisheries economics: an introduction: Stephen Cunningham, Michael R. Dunn, David
Whitmarsh (1985)

Fisheries and aquaculture : Ravi Shankar Piska.

Marine fisheries extension : P.N. Ananth.

Text book of fishery : Surekha M. Gupta.

Prawns and prawn Fisheries of India : C.V. Kurian and V.O. Sebastian.

Remote sensing applications in brackish water fisheries : Arbind Sinha and Sham
Beharisharma.

Identification of prawns / shrimps of India and their culture : A.D. Dholakia.

Textbook of fresh water fish culture : A. N. Kulkarni.

Fresh Water fish culture Vol. 1 : S.K. Sarkar

Aquaculture: Dr. N. Armugam (Saras Publication)

Fresh water Aquaculture : S.H. Ahmad and A.K. Sing.

Industrial fisheries : K.P. Biswas.

Genotoxicity Assessment in fishes A practical approach : N.S. Nagapure, Ravindra
kumar, Bardeo Kushwahe, Poonam Jayant Singh, Satish K. Shrivastva and W.S. Lakra.

Fresh water fish Diversity of Central India : W.S. Lakara and U.K. Sarkar.

Fish Biodiversity of India : D.Kapoor, R.Dayal and A.G. Porniah.

Biology, Breeding and farming of important food fishes : N.M. Chakrabarti.

Manual of Fresh water Biota : Datta Munghi J.S.

Fish and fisheries : pandey and shukla.

Fish Harvesting and processing : R.B. Selvamani and R.K. Mahadevan.

Textbook of fish and fisheries : G.S. Sandhy.

Fish processing and preservation : Charls L. Cutting.

The fishes of India : Francis Day Vol.1 and 2.

Fish and fisheries of India : V.G. Jhingran.

Economics of fisheries : P.N. Panday, B.C. Jha, B.K. Gorai.

Fundamentals of Freshwater Biology : J.D. Munshi and J.S.D. Munshi.

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SYLLABUS EFFECTIVE FROM JUNE - 2013
B. Sc III Year (V&VI Semester)
Fishery Science
Practical Paper – XVI**

Time: 3 hrs

Marks: 50

1] Identify, Classify and comments on cultivable fishes.	(Any five)	15
2] Identify, Classify and comments Non fish organisms	(Any Two)	06
3] Identify & describe fish feed ingredients	(Any two)	06
4] Estimation of protein /Carbohydrate /Lipid from fish feed		08
5] Calculate per hector income of fish production from given data		05
6] Submission of fishing crafts & gears model, prepared fish feed and feed ingredients.		05
7] Record book & viva-voce & Excursion report.		05

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B.Sc III Year (V&VI Semester)
Fishery Science
Practical Paper – XVII**

Time: 3 hrs

Marks : 50

1] Identify ,Classify and Comments on commercially important fishes (Any Three)	09
2] Identify, classify and Comments on commercially important Non fish organisms(AnyTwo)	06
3] Identify and Comments on fishing crafts and gears (One each)	06
4 Identify& describe aquarium fishes & aquarium plant.(Two each)	12
5] Estimation/Isolation of DNA from locally available fish muscle	08
6] Submission of Record book, project report & viva voce.	09

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B.Sc III Year (V&VI Semester)
Fishery Science**

Question Paper Pattern (Paper No XII,XIII,XIV, XV)

Q.1 Long answer question20

OR

Write Notes on:

a)

b)

Q.2 Long answer question20

OR

Write Notes on:

a)

b)

Q.3 Long answer question20

OR

Write Notes on:

a)

b)

Q.4 Write short notes on (any four)20

a)

b)

c)

d)

e)

f)
