



॥ सा विद्या या विमुक्तये ॥

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ, नांदेड

'ज्ञानतीर्थ', विष्णुपुरी, नांदेड - ४३१ ६०६ (महाराष्ट्र राज्य) भारत

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

'Dnyanteerth', Vishnupuri, Nanded - 431 606 (Maharashtra State) INDIA

Established on 17th September, 1994, Recognized By the UGC U/s 2(f) and 12(B), NAAC Re-accredited with 'B++' grade

website: srtmun.ac.in

E-mail: bos@srtmun.ac.in

Academic-1 (BOS) Section

Fax : (02462) 215572

Phone: (02462)215542

एनईपी-२०२० सुधारित श्रेयांक
आराखडयानुसार विज्ञान व तंत्रज्ञान
विद्याशाखेतील पदवी प्रथम वर्षाचे
अभ्यासक्रम शैक्षणिक वर्ष २०२६-२७
पासून लागू करण्याबाबत.

परिपत्रक

या परिपत्रकान्वये सर्व संबंधितांना कळविण्यात येते की, दिनांक २२ एप्रिल २०२६ रोजी संपन्न झालेल्या मा.विद्यापरिषद बैठकीतील विषय क्र.०४/६४-२०२६ च्या ठरावानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील राष्ट्रीय शैक्षणिक धोरण-२०२० सुधारित श्रेयांक आराखडयानुसार पदवी प्रथम वर्षाचे अभ्यासक्रम शैक्षणिक वर्ष २०२६-२७ पासून लागू करण्यास मा.विद्यापरिषदेने मान्यता प्रदान केली आहे. त्यानुसार विज्ञान व तंत्रज्ञान विद्याशाखेतील बी.एस्सी. प्रथम वर्षाचे खालील विषयाचे अभ्यासक्रम शैक्षणिक वर्ष २०२६-२७ पासून लागू करण्यात येत आहे.

01	B.Sc. I Year Physics
02	B.Sc. I Year Fishery science

सदरील परिपत्रक व अभ्यासक्रम प्रस्तुत विद्यापीठाच्या www.srtmun.ac.in या संकेतस्थळावर उपलब्ध आहेत. तरी सदरील बाब ही सर्व संबंधितांच्या निदर्शनास आणून द्यावी, ही विनंती.

'ज्ञानतीर्थ' परिसर,
विष्णुपुरी, नांदेड - ४३१ ६०६.
जा.क्र.:शै-१/परिपत्रक/पदवी/बीएस्सी/२०२६-२७/109
दिनांक : २१.०७.२०२६




उपकुलसचिव
शैक्षणिक (१-अभ्यासक्रम) विभाग

प्रत माहिती व पुढील कार्यवाहीस्तव :-

- १) मा. कुलगुरू महोदयांचे कार्यालय, प्रस्तुत विद्यापीठ.
- २) मा. प्र.कुलगुरू महोदयांचे कार्यालय, प्रस्तुत विद्यापीठ
- ३) मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा, प्रस्तुत विद्यापीठ.
- ४) मा. संचालक, परिक्षा व मुल्यमापन मंडळ, प्रस्तुत विद्यापीठ.
- ५) मा. प्राचार्य, सर्व संबंधित संलग्नित महाविद्यालये, प्रस्तुत विद्यापीठ.
- ६) सिस्टीम एक्सपर्ट, शैक्षणिक विभाग, प्रस्तुत विद्यापीठ. यांना देवून कळविण्यात येते की, परिपत्रक अभ्यासक्रम संकेतस्थळावर प्रसिध्द करण्यात यावेत.

**SWAMI RAM SWAMI RAMANAND TEERTH
MARATHWADA UNIVERSITY, NANDED - 431 606**



**(Credit Framework and Structure of Four Year UG Program with
Multiple Entry and Exit Option as per NEP-2020)**

**UNDERGRADUATE PROGRAMME OF
SCIENCE & TECHNOLOGY**

SUB – FISHERY SCIENCE

Major in DSC and Minor in DSM (Subject)

Syllabus

B.Sc. First Year

Under the Faculty of Science & Technology

*Effective from the Academic Year 2026-27
(As per NEP-2020)*



Details of the Board of Studies Members in the subject Fishery Science under the faculty of Science & Technology of S.R.T.M. University, Nanded

01.	Dr. K. S. Shillewar Department of Fishery Science Science College, Nanded	Chairman
02.	Dr. Seema Shesherao Korde, Department of Fishery Science Azad Mahavidyalaya, Ausa, Dist. Latur.	Member
03.	Dr. Shivaji Prabhakar Chavan School of Life Sciences, SRTM University Nanded	Member
04.	Dr. Dhanaji Waman Patil Department of Fishery Science, Toshniwal Arts Commerce and Science College, Sengaon, Dist. Hingoli	Member
05.	Dr. Guiab D. Khedkar Dr. Babasaheb Ambedkar Marathwada University, Sambhaji Nagar	Member
06.	Dr. Madhuri Shrikant Pathak ICAR- Central Institute of Fisheries Education (ICAR-CIFE) Panch Marg. Off Yari Road Mumbai	Member
07.	Dr. Manoj M. Sharma F/ 17-18, Raj Green Heights, Behind ICICI bank, Rander Road, Jahangirpura, Surat- 395005	Member
08.	Dr. N. G Popatwar Department of Fishery Science, DSM College, Jintur, Dist: Parbhani	Invitee Member
09.	Dr. Sandip Surendra Markad Department of Fishery Science Toshniwal Arts Commerce and Science College, Sengaon, Dist. Hingoli	Invitee Member



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science & Technology

Subject: Fishery Science

B.Sc. First Year Semester I (Level 4.5)

Teaching Scheme

Subject	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional	SFISCT1101	Fish Pond Construction and Management	02	--	02	02	--
	SFISCP1101	Practical based on SFISCT1101	--	02	02	--	04
Generic Electives (from other Faculty)	SFISGE1101	Culture of Indian Major Carps	02	--	02	02	--
Skill Based Course (related to Major)	SFISSC1101	Fish Identification Techniques	--	02	02	--	04
Total Credits			04	04	08	04	08



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science & Technology

Subject: Fishery Science

B.Sc. First Year Semester I (Level 4.5)

Examination Scheme

Subject	Course Code	Course Name	Theory			Practical		
			CA	ESA	Total	CA	ESA	Total
01	02	03	04	05	06	07	08	09
Optional	SFISCT1101	Fish Pond Construction and Management	20	30	50	--	--	--
	SFISCP1101	Practical based on SFISCT1101	--	--	--	20	30	50
Generic Electives (from other Faculty)	SFISGE1101	Culture of Indian Major Carps	20	30	50	--	--	--
Skill Based Course (related to Major)	SFISSC1101	Fish Identification Techniques	--	--	--	20	30	50

[Continuous Assessment (CA): 40% and End Semester Assessment (ESA): 60%]



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science & Technology

Subject: Fishery Science

B.Sc. First Year Semester II (Level 4.5)

Teaching Scheme

Subject	Course Code	Course Name	Credits Assigned			Teaching Scheme (Hrs/ week)	
			Theory	Practical	Total	Theory	Practical
Optional	SFISCT1151	Freshwater Fish Culture System	02	--	02	02	--
	SFISCP1151	Practical based on SFISCT1151	--	02	02	--	04
Generic Electives (from other Faculty)	SFISGE1151	Freshwater Fish Breeding Techniques	02	--	02	02	--
Skill Based Course (related to Major)	SFISSC1151	Fish Processing and Preservation	--	02	02	--	04
Total Credits			04	04	08	04	08



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science & Technology

Subject: Fishery Science

B.Sc. First Year Semester II (Level 4.5)

Examination Scheme

Subject	Course Code	Course Name	Theory			Practical		
			CA	ESA	Total	CA	ESA	Total
01	02	03	04	05	06	07	08	09
Optional	SFISCT1151	Freshwater Fish Culture System	20	30	50	--	--	--
	SFISCP1151	Practical based on SFISCT1151	--	--	--	20	30	50
Generic Electives (from other Faculty)	SFISGE1151	Freshwater fish breeding techniques	20	30	50	--	--	--
Skill Based Course (related to Major)	SFISSC1151	Fish processing and preservation	--	--	--	20	30	50

[Continuous Assessment (CA): 40% and End Semester Assessment (ESA): 60%]



Swami Ramanand Teerth Marathwada University, Nanded
Faculty of Science and Technology,

Four Year UG Program, Fishery Science (w.e.f. 2026-27)

B.Sc. FY Semester-I

SYLLABUS

Periods: 30

No. of Credits: 02

Marks: 50

Major course (Optional) (Theory)

SFISCT 1101: Fish Pond Construction and Management

Course objectives:

1. To understand the basic requirements and criteria for selecting a suitable site for fish farm construction.
2. To study the layout, design and functions of different types of fish ponds.
3. To understand the importance of pre-stocking management for successful fish culture.
4. To develop knowledge of fish seed selection, conditioning, acclimatization and stocking practices.
5. To understand post-stocking management practices, including feeding, water quality, disease management and harvesting.

Course outcomes:

After successful completion of this course, students will be able to:

1. Select a suitable site for fish farm construction based on topography, soil, water supply and other environmental factors.
2. Describe the layout, design and functions of breeding, hatching, nursery, rearing and stocking ponds.
3. Apply suitable pre-stocking management practices, including drying, ploughing, liming, manuring and control of unwanted organisms.
4. Explain the procedures for fish seed selection, conditioning, acclimatization and stocking.
5. Apply appropriate post-stocking management practices for feeding, water quality, disease control and harvesting.

CONTENT

Module	Unit	Title of topic	hrs
1		Unit I: Survey for fish farm construction site	8
	1.1	Selection of site	
	1.2	Topography	
	1.3	Soil type	
	1.4	Water quality and supply	
	1.5	Physico chemical and biological factors affecting fish production	
2		Unit II: Layout and design of different types of pond	7
	2.1	Breeding pond	
	2.2	Hatching pond	
	2.3	Nursery pond	
	2.4	Rearing pond	
	2.5	Stocking pond	
3		Unit III: Pre stocking Management	7
	3.1	i. Drying, ii. Ploughing, iii. Liming, iv. Manuring, v. Fertilization	
	3.2	Eradication of aquatic weeds	
	3.3	Eradication of predatory and weed fishes	
	3.4	Eradication of predatory insects and animals	

4		Unit IV: Stocking and Post stocking Management	8
		Stocking Management	
	4.1	Seed selection	
	4.2	Acclimatization	
	4.3	Conditioning	
	4.4	Stocking fish seed	
		Post-stocking Management	
	4.5	Food and feeding management	
	4.6	Water quality management	
	4.7	Disease management	
	4.8	Harvesting	

References:

1. Jhingran, V. G. (1991). *Fish and Fisheries of India*. 3rd Ed. Hindustan Publishing Corporation, New Delhi.
2. Pillay, T. V. R. and Kutty, M. N. (2005). *Aquaculture: Principles and Practices*. 2nd Ed. Blackwell Publishing.
3. Bardach, J. E., Ryther, J. H. and McLarney, W. O. (1972). *Aquaculture: The Farming and Husbandry of Freshwater and Marine Organisms*. John Wiley & Sons.
4. Rath, R. K. (2000). *Freshwater Aquaculture*. Scientific Publishers, Jodhpur.
5. Huet, M. (1972). *Textbook of Fish Culture: Breeding and Cultivation of Fish*. Fishing News Books, England.
6. Boyd, C. E. (1990). *Water Quality in Ponds for Aquaculture*. Birmingham Publishing Company, Alabama.
7. Boyd, C. E. (1995). *Bottom Soils, Sediment and Pond Aquaculture*. Chapman & Hall, New York.
8. Boyd, C. E. and Tucker, C. S. (1998). *Pond Aquaculture Water Quality Management*. Springer.
9. Santhanam, R., Sukumaran, N. and Natarajan, P. *A Manual of Freshwater Aquaculture*. Oxford & IBH Publishing Co., New Delhi.
10. ICAR (2006). *Handbook of Fisheries and Aquaculture*. Indian Council of Agricultural Research, New Delhi.
11. Saini, V. P., Surnar, S. R., Ojha, M. L., Ujjania, N. C. and Yadav, R. (2021). *Basics of Freshwater Aquaculture*. Himanshu Publications, New Delhi.
12. Reddy, M. S. and Sambasiva Rao, K. R. S. *A Text Book of Aquaculture*. Discovery Publishing House, New Delhi.
13. Srivastava, C. B. L. *A Text Book of Fishery Science and Indian Fisheries*. Kitab Mahal, Allahabad.
14. Patil, Dhanaji and Sandip Markad (2024). *गोड्या पाण्यातील मत्स्य संवर्धन आणि बिजोत्पादन (Freshwater Fish Culture and Seed Production)*. Notion Press, Inc. 184 p. ISBN: 979-8-89632-657-1.
15. Patil, Dhanaji and Sandip Markad (Eds.) (2026). *Sustainable Aquaculture: Recent Advances and Techniques*. Apple Academic Press Inc., Palm Bay, Florida, USA. 412 p.



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology,

Four Year UG Program, Fishery Science (w.e.f. 2026-27)

B.Sc. FY Semester-I

SYLLABUS

Periods: 60

No. of Credits: 02

Marks: 50

Major course (Optional) (Practical)

SFISCP1101 Practical based on SFISCT1101 (Fish Pond Construction and Management)

Course Objectives:

1. To develop practical skills in the analysis of important pond water quality parameters.
2. To identify plankton, predatory and weed fishes, predatory insects and aquatic weeds commonly found in fish ponds.
3. To familiarize students with commonly used fish feed ingredients.
4. To develop basic practical knowledge of the digestive system of fishes through dissection.
5. To provide field exposure to fish farm management and develop skills in preparing fish farm layout plans.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Estimate important pond water quality parameters such as dissolved oxygen, free carbon dioxide, salinity and alkalinity.
2. Identify common phytoplankton, zooplankton, predatory and weed fishes, predatory insects and aquatic weeds.
3. Identify commonly used fish feed ingredients.
4. Observe fish farm operations and prepare a basic layout plan of a fish farm.

CONTENT

Module	Unit	Title of Practical	hrs
	1	Estimation Dissolved Oxygen from pond water	
	2	Estimation Dissolved carbon dioxide from pond water	
	3	Estimation Dissolved salinity from pond water	
	4	Estimation alkalinity from pond water	
	5	Study of phytoplankton and zooplanktons	
	6	Identification and study of cultivable fishes: Catla, Rohu, Mrigal, Common Carp, Grass carp, Prawn	
1	7	Identification of predatory and Weed fishes (Any three)	60
	8	Identification predatory insects (Any three)	
	9	Identification of aquatic weeds (Any three)	
	10	Identification of fish feed ingredient (Any three)	
	11	Visit to fish farm and submission of report	
	12	Preparation and submission of layout plan of fish farm.	

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

Faculty of Science and Technology

B. Sc. First Year (NEP 2020) Semester- I

Effective from 2026

Subject: Fishery Science

SFISCP 1101 based on SFISCT 1101

Fish Pond Construction and Managements

Centre:

Date:

Time:

Batch No.:

Credits: 02

Marks: 30

- | | | |
|------|---|----|
| Q. 1 | Analyse given water sample for estimation of
(Dissolved Oxygen/Free Carbon Dioxide/Salinity/Alkalinity) | 06 |
| Q. 2 | Identify and comment on given spot. (One each from Cultivable fish, Predatory/
Weed fish, Fish seed)
a.
b.
c. | 06 |
| Q. 3 | Identify and comment on given spot. (One each from predatory insects and
aquatic weeds)
a.
b. | 04 |
| Q. 4 | Identify and comment on given spot. (One each from Plankton, fish feed
ingredient)
a.
b. | 04 |
| Q. 5 | Viva-voce | 05 |
| Q. 6 | Student Performance during semester | 03 |
| Q. 7 | Journal / Record book | 02 |

Examiner 1

Examiner 2



Swami Ramanand Teerth Marathwada University, Nanded
Faculty of Science and Technology,

Four Year UG Program, Fishery Science (w.e.f. 2026-27)

B.Sc. FY Semester-I

SYLLABUS

Periods: 30

No. of Credits: 02

Marks: 50

Generic Elective (Theory)

SFISGE 1101 (2 Credit) Culture of Indian Major Carps

Course Objectives:

1. To introduce the scope, importance and basic principles of pisciculture.
2. To understand water quality requirements and the desirable qualities of cultivable fishes.
3. To study different fish culture practices based on the level of management and environmental conditions.
4. To understand traditional fish culture systems such as pond, reservoir, paddy and pen culture.
5. To introduce modern fish culture methods such as raceway, cage, biofloc and aquaponics.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Explain the scope, importance and basic principles of pisciculture.
2. Describe the water quality requirements and desirable qualities of cultivable fishes.
3. Differentiate between extensive, semi-intensive and intensive fish culture practices.
4. Explain the principles of pond, reservoir, paddy and pen culture systems.
5. Describe modern fish culture methods, including raceway, cage, biofloc and aquaponics.

CONTENT

Module	Unit	Title of topics	hrs
1		Unit I: Introduction	7
	1.1	Aims, Objective, scope and importance of pisciculture	
	1.2	Water quality for fish culture	
	1.3	Types of cultivable fishes	
	1.4	Qualities of cultivable fishes	
2		Unit II: Introduction to culture practices	8
	2.1	Culture based on commercial consideration	
	2.2	Extensive culture	
	2.3	Intensive culture	
	2.4	Semi-intensive culture	
	2.5	Cold and warm water fish culture.	
2		Unit III: Fish culture systems	8
	3.1	Pond culture	
	3.2	Reservoir fish culture	
	3.3	Paddy fish culture.	
	3.4	Pen culture	
4		Unit IV: Introduction to modern fish culture methods	7
	4.1	Raceway culture	

	4.2	Cage culture	
	4.3	Biofloc fish culture	
	4.4	Aquaponics fish culture	

Text Books:

1. Patil, Dhanaji and Sandip Markad (2024). गोड्या पाण्यातील मत्स्य संवर्धन आणि बिजोत्पादन (*Freshwater Fish Culture and Seed Production*). Notion Press, Inc. 184 p. ISBN: 979-8-89632-657-1.

References:

1. Jhingran, V. G. (1991). *Fish and Fisheries of India*. 3rd Ed. Hindustan Pub Corp, New Delhi.
2. Pillay, T. V. R. and Kutty, M. N. (2005). *Aquaculture: Principles and Practices*. 2nd Ed. Blackwell Publishing.
3. Rath, R. K. (2000). *Freshwater Aquaculture*. Scientific Publishers, Jodhpur.
4. Huet, M. (1972). *Textbook of Fish Culture: Breeding and Cultivation of Fish*. Fishing News Books.
5. Bardach, J. E., Ryther, J. H. and McLarney, W. O. (1972). *Aquaculture: The Farming and Husbandry of Freshwater and Marine Organisms*. John Wiley & Sons.
6. Santhanam, R., Sukumaran, N. and Natarajan, P. *A Manual of Freshwater Aquaculture*. Oxford & IBH Publishing Co., New Delhi.
7. ICAR (2006). *Handbook of Fisheries and Aquaculture*. ICAR, New Delhi.
8. Saini, V. P., Surnar, S. R., Ojha, M. L., Ujjania, N. C. and Yadav, R. (2021). *Basics of Freshwater Aquaculture*. Himanshu Publications, New Delhi.
9. Reddy, M. S. and Sambasiva Rao, K. R. S. *A Text Book of Aquaculture*. Discovery Publishing House, New Delhi.
10. Avnimelech, Y. (2015). *Biofloc Technology: A Practical Guide Book*. 3rd Ed. World Aqua. Society.
11. Patil, Dhanaji and Sandip Markad (Eds.) (2026). *Sustainable Aquaculture: Recent Advances and Techniques*. Apple Academic Press Inc., Palm Bay, Florida, USA. 412 p.



Swami Ramanand Teerth Marathwada University, Nanded
Faculty of Science and Technology,

Four Year UG Program, Fishery Science (w.e.f. 2026-27)

B.Sc. FY Semester-I

SYLLABUS

Periods: 30

No. of Credits: 02

Marks: 50

Skill Based Course (Practical)

SFISSC 1101: Fish Identification Techniques

Course Objectives:

1. To introduce the basic principles of fish classification and the general characters used in fish identification.
2. To develop practical skills in the preservation of fish specimens for museum and taxonomic studies.
3. To familiarize students with different body forms, fins and scales of fishes.
4. To develop skills in taking standard measurements and recording morphometric and meristic characters of fishes.
5. To provide hands-on experience in the collection, identification and documentation of different fish species.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Explain the basic principles of fish classification and general characters of fishes.
2. Preserve fish specimens using appropriate methods for museum and taxonomic studies.
3. Identify different types of fins, scales and body forms in fishes.
4. Measure and record important morphometric and meristic characters used in fish identification.
5. Collect, identify and document fish specimens using appropriate identification techniques and field observations.

CONTENT

Module	Unit	Title of topic	hrs
1	1	Introduction to fish classification	60
	2	Methods of fish preservation for museum study	
	3	Fish and its general characters	
	4	Fin and its types	
	5	Body forms in fishes	
	6	Types of scales in fishes	
	7	Fish identification technique –Definitions and measurements	
	8	Fish identification based on morphometric characters (any 4)	
	9	Fish identification based on meristic characters (any 4)	
	10	Collection of different types of fishes and their submission	
	11	Visit to fish market and submission of report.	



Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology,

Four Year UG Program, Fishery Science (w.e.f. 2026-27)

B.Sc. FY Semester-II

SYLLABUS

Periods: 30

No. of Credits: 02

Marks: 50

Major course (Optional) (Theory)

SFISCT1151- Freshwater Fish Culture

Course Objectives:

1. To introduce the scope, importance and basic requirements of freshwater aquaculture.
2. To understand the characteristics of cultivable fishes and water quality requirements for successful fish culture.
3. To study the principles and techniques of induced breeding through hypophysation and the use of synthetic hormones.
4. To understand different fish culture systems, including pond, paddy field and pen culture.
5. To introduce modern fish culture methods such as raceway, cage, recirculatory aquaculture system and biofloc culture.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Explain the scope and importance of freshwater aquaculture and the requirements of cultivable fishes.
2. Describe the water quality requirements for successful freshwater fish culture.
3. Explain the procedure of induced breeding, including brooder selection, pituitary gland preparation and the use of hormones.
4. Describe different fish culture systems, including pond, paddy field and pen culture.
5. Differentiate between extensive, semi-intensive and intensive culture and explain modern fish culture methods such as raceway, cage, RAS and biofloc culture.

CONTENT

Module	Unit	Title of topics	Hrs
1		Unit I: Introduction to aquaculture	7
	1.1	Objective scope and importance of aquaculture	
	1.2	Water quality for fish culture	
	1.3	Types of cultivable fishes	
	1.4	Qualities of cultivable fishes	
2		Unit II: Induced breeding by hypophysation	7
	2.1	History of induced breeding	
	2.2	Identification & selection of brooders	
	2.3	Dissection and removal of pituitary gland	
	2.4	Preservation and storage of pituitary gland	
	2.5	Preparation of gland suspension for injection and dosage	
	2.6	Hormones responsible for induced breeding	
	2.7	Synthetic hormones used in induced breeding	
3		Unit III: Types of fish culture	8
	3.1	Fish culture in pond	
	3.2	Fish culture in paddy fields	

	3.3	Fish culture in pens	
		Unit IV: Introduction to modern fish culture methods	
	4.1	Extensive culture	
	4.2	Intensive culture	
	4.3	Semi intensive culture	
4	4.4	Raceway culture	8
	4.5	Cage Culture	
	4.6	Recirculatory Aquaculture System(RAS)	
	4.7	Biofloc culture	

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Swami Ramanand Teerth Marathwada University, Nanded

Faculty of Science and Technology,

Four Year UG Program, Fishery Science (w.e.f. 2026-27)

B.Sc. FY Semester-II

SYLLABUS

Periods: 30

No. of Credits: 02

Marks: 50

Major course (Optional) (Practical)

SFISCP1151 Practical based on SFISCT1151 (Freshwater Fish Culture)

Course Objectives:

1. To develop practical skills in the identification of different stages of fish seed.
2. To study the morphometric and meristic characters used in the identification of bony fishes.
3. To identify and study the taxonomic characters of Indian major carps, exotic carps and common weed fishes.
4. To develop practical skills in the preparation of permanent mounts of different types of fish scales.
5. To provide practical knowledge of pituitary gland collection, preparation of pituitary extract and calculation of injection doses for induced breeding.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Identify spawn, fry and fingerling stages of fish seed.
2. Record and interpret important morphometric and meristic characters of bony fishes.
3. Identify Indian major carps, exotic carps and common weed fishes based on their taxonomic characters.
4. Prepare permanent mounts of cycloid, ctenoid and placoid scales.
5. Remove the pituitary gland, prepare pituitary gland extract and calculate the required injection dose for induced breeding of fishes.

CONTENT

Module	Unit	Title of topics	hrs
1	1	Identification of seeds-spawn, fry and fingerlings	60
	2	Study of different Morphometric characteristics of bony fishes.	
	3	Study of different Meristic characteristics of bony fishes.	
	4	Taxonomical study of Indian Major Carps: <i>Catla catla</i> , <i>Labeo rohita</i> , <i>Cirrhinus mrigala</i>	
	5	Taxonomical study of Exotic Carps: <i>Hypophthalmichthys molitrix</i> , <i>Ctenopharyngodon Idella</i> , <i>Cyprinus carpio</i>	
	6	Study of weed fishes (Any 3)	
	7	Permanent mounting Cycloid and Ctenoid scales.	
	8	Permanent mounting Placoid scales	
	9	Dissection and removal of pituitary gland	
	10	Preparation of pituitary gland extract and doses of injection.	
	11	Visit to fish market/Farm/Reservoir and submission of report.	

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED
Faculty of Science and Technology
B. Sc. First Year (NEP 2020) Semester- II
Effective from 2026
Subject: Fishery Science
SFISCP1151 based on SFISCT 1151
(Freshwater Fish Culture)

Centre:

Date:

Time:

Batch No.:

Credits: 02

Marks: 30

-
- | | | |
|------|--|----|
| Q.1 | Dissect given fish to expose system. | 06 |
| | OR | |
| | Prepare extract of provided Pituitary gland. | |
| Q.2 | Permanent Mounting and identification of scales | 05 |
| Q.3 | Define and measure morphometric and meristic characters from the given fish (Any five) | 05 |
| Q.4 | Identify, Classify and describe given fish specimen (Any Two) | 04 |
| | a. | |
| | b. | |
| Q. 5 | Viva-voce | 05 |
| Q. 6 | Student Performance during semester | 03 |
| Q. 7 | Journal / Record book | 02 |

Examiner 1

Examiner 2



Swami Ramanand Teerth Marathwada University, Nanded
Faculty of Science and Technology,

Four Year UG Program, Fishery Science (w.e.f. 2026-27)

B.Sc. FY Semester-II

SYLLABUS

Periods: 60

No. of Credits: 02

Marks: 50

Generic Elective (Theory)

SFISGE1151- Freshwater Fish Breeding Techniques

Course Objectives:

1. To introduce the basic principles and methods of freshwater fish breeding.
2. To understand bundh breeding and artificial fertilization techniques used in fish seed production.
3. To study induced breeding by hypophysation, including brood fish selection and the use of hormones.
4. To understand the principles, structure and management of different fish hatchery systems.
5. To study the methods of fish seed transportation and the management of mortality during transport.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Explain different fish breeding techniques, including bundh breeding and artificial fertilization.
2. Describe the process of induced breeding, from brood fish selection to hormone administration.
3. Explain the collection, preservation and use of the pituitary gland and synthetic hormones in fish breeding.
4. Describe the structure, working and management of different fish hatchery systems.
5. Explain open and closed fish seed transportation systems and methods for reducing mortality during transport.

CONTENT

Module	Unit	Title of topics	Hrs
1		Breeding techniques	7
	1.1	Introduction to Bundh breeding .	
	1.2	Types of bundhs –i) Wet bundh ii) Dry bundh iii) Modern bundh	
	1.3	Artificial fertilization by stripping: i) Dry Method ii) Wet Method	
2		Induced breeding by hypophysation	8
	2.1	History of induced breeding	
	2.2	Identification & selection of brooders	
	2.3	Dissection and removal of pituitary gland	
	2.4	Preservation and storage of pituitary gland	
	2.5	Preparation of gland suspension for injection and dosage	
	2.6	Hormones responsible for induced breeding	
	2.7	Synthetic hormones used in induced breeding	
3		Hatcheries and management (Principle, structure and management)	8
	3.1	Hatching happa	
	3.2	Glass jar hatchery	
	3.3	CIFE D 80 model (Dwivedi – 80)	

	3.4	Chinese circular hatchery	
4		Fish seed transportation	
	4.1	Open transportation system	
	4.2	Close transportation system	
	4.3	Causes of mortality in transportation	7
	4.4	Use of chemicals in live-fish transportation	
	4.5	Aesthetic drugs use in transport	
	4.6	Antiseptic and antibiotics used in transportation.	

Text Books:

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Swami Ramanand Teerth Marathwada University, Nanded
Faculty of Science and Technology,

Four Year UG Program, Fishery Science (w.e.f. 2026-27)

B.Sc. FY Semester-II

SYLLABUS

Periods: 60

No. of Credits: 02

Marks: 50

Skill Based Course (Practical)

SFISSC1151 Fish Processing and Preservation

Course Objectives:

1. To introduce the basic principles and importance of fish processing and preservation.
2. To develop practical skills in primary fish processing methods such as washing, gutting and temperature control.
3. To understand the role of dehydration, salting, drying and preservatives in extending the shelf life of fish.
4. To provide practical knowledge of traditional and modern methods of fish preservation.
5. To develop skills in handling and preserving fish using suitable processing and preservation techniques.

Course Outcomes:

After successful completion of this course, students will be able to:

1. Perform basic fish processing operations such as washing, gutting and temperature control.
2. Apply dehydration, salting, drying and suitable preservatives for fish preservation.
3. Demonstrate sun drying, mechanical drying, dry salting and wet salting methods.
4. Explain and apply different preservation methods such as cold storage, canning, smoking and pickling.
5. Select a suitable processing and preservation method for maintaining the quality and shelf life of fish.

CONTENT

Module	Unit	Topic	Hrs
1		Fish Processing:	60
	1	Washing,	
	2	Gutting,	
	3	Lowering the temperature,	
	4	Rising the temperature,	
	5	Dehydration,	
	6	Salting,	
	7	Drying,	
	8	Use of preservatives,	
		Methods of Preservation	
	9	Drying: Sun drying, Mechanical drying.	
	10	Salting: Dry salting, Wet salting	
	11	Cold storage.	
	12	Canning	
	13	Smoking	
	14	Pickling	

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