

UNIVERSITY OF MUMBAI


No.UG/ 247 /2016-17
Mumbai-400 032
7th February, 2017

The Principal,
Arts, Science and Commerce College,
At Post Lanja,
Taluka Lanja
Rantagiri-416701.

Sir,

I am to invite your attention to the Ordinances, Regulations, and Syllabi relating to the Certificate Course in Ornamental Fish Farming (Sem. I & II) as per (CBCS) and to inform you that the recommendation made by UGC Innovative Programme held on 4th July, 2016 has been accepted by the Academic Council at its meeting held on 14th July, 2016 **vide** item No.4.34 and subsequently approved by the Management Council at its meeting held on 18th November, 2016 **vide** item No.29 and that in accordance therewith, in exercise of the powers conferred upon the Management Council under Section 54 (1) and 55 (1) of the Maharashtra Universities Act, 1994 and the Ordinances 6352 and 6353 and Regulations 9076, 9077 and 9078 and the syllabus for the Certificate Course in Ornamental Fish Farming (Sem. I & II) as per (CBCS) has been introduced, which is available on the University's web site (www.mu.ac.in) and that the same has been brought into force with effect from the academic year 2016-17.

Yours faithfully


(Dr.M.A.Khan)
REGISTRAR


A.C/4.34 /14/07/2016
M.C/29/18/11/2016

No. UG/ 247 -A of 2016

MUMBAI-400 7th February, 2017

Copy forwarded with compliments for information to:-

- 1) The Director, Board of Colleges and University Development,
- 2) The Offg. Controller of Examinations,
- 3) The Principals of the affiliated Colleges in Arts, Science and Commerce and the Heads of recognized Institutions concerned.
- 4) The Co-Ordinator, Faculty of Arts, Science and Commerce,
- 5) The Co-Ordinator, University Computerization Centre.


(Dr.M.A.Khan)
REGISTRAR

P.T.O

UNIVERSITY OF MUMBAI



Syllabus for Approval

Sr. No.	Heading	Particulars
1	Title of the Course	CERTIFICATE COURSE IN ORNAMENTAL FISH FARMING
2	Eligibility for Admission	Candidate who passed 10+2 examination with at least 45% marks in aggregate in Arts / Science / Commerce.
3	Passing Marks	The candidate must obtain 35 % of the total marks in theory and practical separately to pass the course.
4	Ordinances / Regulations (if any)	UGC Circular F14-4/2006 (CPP-II).
5	No. of Years / Semesters	One Year (Two Terms)
6	Level	P.G. / U.G. / Diploma / Certificate (Strike out which is not applicable)
7	Pattern	Yearly / Semester (Strike out which is not applicable)
8	Status	New / Revised (Strike out which is not applicable)
9	To be implemented from the Academic Year	From Academic Year _____

Date:

Signature:

Name of BOS Chairperson / Dean: _____

UNIVERSITY OF MUMBAI

New Education Society's

Arts, Commerce and Science College, Lanja

UGC Funded Carrier Oriented Courses

Syllabus of
Certificate Course in
ORNAMENTAL FISH
FARMING

Course Code: UGCCOC OFT 01 – For Theory and

UGCCOC OFP 01 – For Practical

CONTENT

1. Preamble
2. Objectives of the Course.
3. Ordinance.
4. Fee Structure.
5. Tables of Courses, Topics, credits and workload
6. Theory syllabus for certificate course in Ornamental Fish Farming (Course code: UGCCOC-OFT- 01)
7. Practical syllabus for certificate course in Ornamental Fish Farming (Course code: UGCCOC-OFP-O1)
8. Annexure –I (Suggested Field Visits: Group activity)
9. Annexure –II (Suggested Topics For Entrepreneurial Skill Development: Group activity)
10. Annexure –III (Suggested Projects: Individual activity)
11. Annexure –IV (Suggested Topics For Assignment: Group activity)
12. References.
13. Web Addresses.
14. You Tube Videos Links.

PREAMBLE

Globalisation of education and economy has led the University Grants Commission (UGC) to reorient and reshape its policies and programmes to make the current Indian Higher Education System more relevant and career-oriented with focus on quality and excellence. It is envisaged that professionally qualified graduates with a sound knowledge of their core disciplines and expertise in a concerned skill will have more openings in service, industry and self-employment sectors. Demand and scope for such professionally trained graduates are visible in the applied fields of almost all basic/core disciplines and faculties in the current changing global scenario and is likely to increase in the future.

The present Career Oriented Course (COC) in '**Ornamental Fish Farming**' was introduced for F.Y. Undergraduate students of Science, Commerce and a Arts faculty the academic year 2015-16 with a view to enhance essential for employability. This is the first time we are introducing this syllabus to the University of Mumbai. This syllabus, emphasis on development of entrepreneurial potential and skills amongst the students. From the academic year 2010-2011, the University has introduced Credit Based Semester and Grading System with continuous evaluation involving Internal and External Assessment. This syllabus is modularized offering opportunity to learners to study techniques in Ornamental fish farming theoretically, practically and experimentally by directly working with established and successful entrepreneurs in this field.

OBJECTIVES OF THE COURSE:

- 1) To inculcate importance of ornamental fish farming in relation with entrepreneurship development.
- 2) To give students knowledge about various techniques of ornamental fish breeding, rearing and its marketing to make them self sustainable after graduation.
- 3) To teach techniques of construction of glass aquarium and its maintenance.
- 4) To teach students about fish food production and health related problems with ornamental fish.

**ORDINANCES FOR CERTIFICATE COURSE/ DIPLOMA/ADVANCEDDIPLOMA
COURSE IN ORNAMENTAL FISH FARMING (ADD-ON-COURSE)**

The Certificate Course/Diploma/Advanced Diploma Course in **Ornamental fish farming**, Career Oriented Programme of U.G.C. 2003-04 introduced as Add-on-Course at First Degree Level in B.A. / B.Sc / B. Com will be covered under following ordinances.

1. **Number of Students per batch are 40.**
2. The admission/examination shall be opened to any candidate who has passed 10+2 examination with at least 45% marks in aggregate in science/arts/commerce.
3. The candidate after passing examination will be awarded a separate “Certificate / Diploma/Advanced Diploma in **Ornamental Fish Farming** in addition to his/her regular degree/Detailed Marks Card of B.A., B.Sc. and B.Com.
4. The supplementary examination shall be held in September or as fixed by the Academic Council. This examination shall be open to candidates who have been declared reappear in Certificate Course/ Diploma/Advanced Diploma Course.
5. The candidate who doesn't pass in the supplementary examination will be given another chance to appear in above said course along with forthcoming annual examination.
6. A candidate who passed the course in the supplementary examination or in the third chance in annual examination can appear alongside in next subsequent examination of above said course.
7. The candidate who is unable to pass the course in three given chances, will not be allowed to continue the above said course.
8. Every candidate will be required to attend minimum of 75% lectures/periods delivered to that class.
9. The candidate must obtain 35% of the total marks in theory and practical separately to pass the course.
10. The candidate must have obtained in House Examination at least 25% marks in the subject.
11. Candidates will be offered English/Marathi as the medium of Instructions/ Examination.

FEE STRUCTURE:

Name of the Course	Tuition fee	Laboratory Fee	Library Fee	Total
Certificate Course in Bee Keeping and Honey Processing	800.00	400.00	300.00	1500.00

Amount in ₹

SYLLABUS OF THE COURSE

TITLE OF THE COURSE: ORNAMENTAL FISH FARMING

SPONSORED BY UNIVERSITY GRANT COMMISSION, NEW DELHI

Course	Unit	Topic	Credit	L/Week
Term-I	I	Introduction to Aquaculture and Ornamental Fishes Trading	I	04
	II	Introduction to Ornamental fishes	I	
	III	Engineering Aspect and construction of aquarium (I)	I	
	IV	Engineering Aspect and construction of aquarium (II)	I	
Term -II	I	Fish Breeding and rearing in Live Bearers	I	04
	II	Fish Breeding and rearing in Egg layers	I	
	III	Ornamental fish farming-Management Aspects	I	
	IV	Introduction to Aquarium plants and its propagation techniques	I	
Practical based on Term – I & II				04
Total				12

CERTIFICATE COURSE IN ORNAMENTAL FISH FARMING

Theory Syllabus of One Year Certificate Course

Program of the Course:

1. Course will be of 20 Credits, each credit will have 15 hours (45min.)
2. Out of 20 credits 8 credits will be assigned to field work/project/training
3. The candidate required to attend 75% lectures/periods.
4. The candidate must obtained 35% of the total marks in theory and practical/project work separate to pass the course.
5. Candidate will be offered English/Marathi as a medium of instructions/examination.
6. All 12th examination passed and first year appearing under graduate students are eligible for this course.

Term-I (UNIT-I to UNIT-IV) & Term-II (UNIT-I to UNIT-IV)

Term - I

UNIT-I Introduction to Aquaculture and Ornamental Fishes Trading (15 L)

- Basics of aquaculture-definition and scope. History of aquaculture: Present global and national scenario.
- World trade of ornamental fish and export potential. Different varieties of exotic and indigenous fishes.
- Ornamental fisheries-e new dimensions in aquaculture entrepreneurship

UNIT- II Introduction to Ornamental fishes (15 L)

- Introduction to aquarium and aquarium accessories.
- Basic knowledge on profile of ornamental fishes in world
- Basic knowledge and profile of some selected indigenous Indian ornamental

UNIT-III Engineering Aspect and construction of aquarium (I) (15L)

- Design and construction of public fresh water and marine aquaria and oceanarium.
- Aerators, filters and lighting.
- Biofilters in aquarium.

UNIT IV Engineering Aspect and construction of aquarium (II) (15 L)

- Construction, settings and maintenance of aquarium
- Construction of ornamental fish unit
- Engineering aspect in Ornamental Fish Farming

Term II

UNIT-I Fish Breeding and rearing in Live Bearers (15L)

- Breeding of ornamental fish with reference to live bearer species.
- Breeding of Guppies, Mollies, Swardtail fish and Platy fish
- Introduction hatchery management system for live bearers
- Nursery management of live bearers
- Rearing of live bearers

UNIT- II Fish Breeding and rearing in Egg layers

- Breeding of ornamental fish with reference to selected egg layer species.
- Introduction to Breeding of Angel fish, Zebra fish and Neon tetra
- Introduction hatchery management system for egg layers
- Nursery management of egg layers
- Special emphasis on Breeding of Gold fish.

UNIT-III Ornamental fish farming-Management Aspects (15L)

- Ornamental Fish-diseases and their management
- Live Food culture for tropical ornamental fish
- Feeding for breeding and maintenance of ornamental fish.
- Health management in Ornamental Fish Farming.

UNIT-IV Introduction to Aquarium plants and its propagation techniques (15L)

- Introduction to Aquarium plants and their export potential.
- Profiles of some selected aquarium plants.Morphology, multiplication of aquarium plants – different methods. Indigenous ornamental plants of Western Ghats.
- Aquarium plant propagation.
- Management of ornamental aquatic plants and its trading

PRACTICAL

Practical: Term- I
1) Identification of common live bearer ornamental fishes: - Guppy, Molly, Platy, Sword Tail,
2) Identification of common Egg layer ornamental fishes: - Angel, Neon tetra
3) Identification of common Egg layer ornamental fishes: Discus and Siamese fighter
4) Identification of common Egg layer ornamental fishes: Gold fish, Koi Carp,
5) Identification of common Egg layer ornamental fishes: Danio- Zebra, and Flower Horn.
6) Fabrication of all-glass aquarium demonstration and individual performance. (03 practical)
Term - II
1) Setting-up and maintenance of aquarium
2) Introduction to Aquarium accessories and equipments.
3) Conditioning and packing of ornamental fishes.
4) Preparation of ornamental fish feed.
5) Setting-up of breeding tank for live bearers (02 practical)
6) Setting-up of breeding tank of goldfish (02 practical)
7) Identification of ornamental fish diseases and prophylactic measures.
8) Identification of aquarium plants (02 practical)

MODALITY OF ASSESSMENT:

Term End Theory Assessment –100%

100 marks

1. Duration - These examinations shall be of three hours duration.
2. Theory question paper pattern:-
 - a) There shall be **five** questions each of **20** marks. On each unit there will be one question & fifth one will be based on all the four units.
 - b) All questions shall be compulsory with internal choice within the questions. Each question will be of **40** marks with options.
 - c) Questions may be sub divided into sub questions a, b, c & d only, each carrying **10**marks **OR** a, b, c, d, e , f and g only each carrying **four** marks and the allocation of marks depends on the weightage of the topic.

Practical Examination Pattern: There will not be any external examination/ evaluation for practical.

Term end practical examination:-

Sr. No.	Particulars	Marks
1	Laboratory work	80
2	Journal	10
3	Viva voce	10

In case of loss of Journal and/ or Report, a Lost Certificate should be obtained from Head of the Department/ Co-ordinator of the department; failing which the student will not be allowed to appear for the practical examination.

N.B:

1. It is pertinent to note that we have to adhere strictly to the directions as given in the UGC Circular F14-4/2006 (CPP-II).
2. Apart from the institutional Animal Ethics Committee (IAEC) and any other Committee appointed by a Competent Authority/Body from time to time, every college should constitute the following Committees:
 - I. A Committee for the Purpose of Care and Supervision of Experimental Animals (CPCSEA) and
 - II. A Dissection Monitoring Committee (DMC)

Composition of DMC shall be as follows:

- a. Head of the Concerned Department (Convener/Chairperson)
- b. Two Senior Faculty Members of the concerned Department
- c. One Faculty of related department from the same College
- d. One or two members of related department from neighbouring colleges.

ANNEXURE -I

Suggested Field Visits

Field visits are to be organised to facilitate students to have firsthand experience and exposure to technology / production / functioning of an organisation / unit or witness a relevant activity.

Each student must make at least 02 (Two) such visits to the units/markets/public aquarium out of 2 to 3 such visits organised by the college.

i) Visit to one of the units with one or multiple activities such as .

- Ornamental fish farm / Nursery/ Hatchery.

ii) Visit any production units such as

- Ornamental fish Food industry
- Ornamental articles.

iii) **Govt. Offices** such as

- Fishery Department.
- MPEDA, Mumbai
- NFDB, Hyderabad
- CIFI, Mumbai

iv) Visit to National Laboratories, National Research Labs & Training Institutes such as NIO, Goa; CIFE, Mumbai; Fishery College, Ratnagiri; MBRS, Ratnagiri.

(Field visit is desirable to know the organization; however guest lecturers could also be helpful in understanding functioning).

ANNEXURE –II

Suggested Topics For Entrepreneurial Skill Development

1. Setting and Maintenance of fresh water aquarium.
2. Setting and Maintenance of marine aquarium.
3. Breeding of various aquarium fishes.
4. Preparation of aquarium fish feed.
5. Breeding of aquarium fishes.
6. Rearing of aquarium fishes.
7. Propagation of aquatic plants.

ANNEXURE -III

Suggested Topics For Individual Project

1. Feasibility report of the maintenance of aquarium fishes in high profile residences.
2. Probability report of maintenance of a culture of Chaetoceros & Artemia by the fish farmers.
4. Project report for the establishment of small / medium / large ornamental fish farming unit
5. Feasibility report of various packaging materials in freezing / canning industry.
6. Feasibility report for establishing an aquarium shop.
7. Feasibility report for establishing a fish feed industry.
8. Setting up of marine aquarium with various accessories and its costing.
9. Finding herbal medicines for ornamental fish diseases
- 10 Propagation of aquarium plants and tissue culturing methods

REFERENCES:

Reference Books & Periodicals / Papers

- Fish & Fisheries in India – By Jhingran V.G. – Hindustan Pub. Corporation – New Delhi.
- Hand Book of Fresh Water Fishes of India By Beaven C.R. – Narendra Pub. House.
- Fish Biology By C.B.C. Srivastava – Narendra Pub. House.
- Ecological Methods for Field & Laboratory Investigations By P. Michael.
- Fish & Fisheries By Chandy – National Book Trust.
- Fishery Science By Samtharam R. – Daya Pub. House – 1990.
- Aquaculture, Principles and Practices By Pillay T.V.R. – Fishing News Books (1988).
- Fisheries Biology, Assessment and Management By Michael King – Fishing News Publishers (1995).
- Handbook of Fish Biology and Fisheries Edited By J.B. Hart & John Reynold.
- Course Manual in Fishing Technology By Latha Shenoy, CIFE, Versova, Mumbai.
- An Introduction to Fishes By Khanna S.S. – Central Book Depot, Allahabad (1993).
- Text Book of Fish Biology and Indian Fisheries By Dr. R. P. Parihar, Central Pub. House,
- Rath,A.K. Freshwater Aquaculture,
- Santhanam, et.al. a Manual of Freshwater Aquaculture
- Pillay,T.V.R. Aquaculture – Principles and Practices
- Jhingran,V.G. Fish and Fisheries of India
- Jhingran,V.G and Sehgal,K.L. Coldwater Fisheries of India.
- Bardach, Rhyther and McLarney. Aquaculture
- Huet, M. Textbook of Aquaculture.
- Rogen, Pallin and Shehadeh. Integrated Agriculture and Aquafarming Farming
- system.
- Boyd,C.E. Qater Quality in Warmwater Fish Ponds
- Moyle,P.B. and Cech,J.J. Fishes – An Introduction to Ichthyology

WEB ADDRESS:

www.mpeda.com

www.cifa.in/

www.fao.org > FAO Home > Fisheries & Aquaculture

www.ofish.org

www.nabard.org/english/fish_ornamental_fish.aspx

YOU TUBE VIDEOS LINKS:

<https://www.youtube.com/watch?v=jw8j6kQRIEo>

<https://www.youtube.com/watch?v=zDQy0IXozhs>

<https://www.youtube.com/watch?v=3llw1p0Fmvl>

<https://www.youtube.com/watch?v=IUUbINZzURo>

<https://www.youtube.com/watch?v=-gnqAPVbTDA>