UZO-521 Introduction to Aquaculture Cr. (2)

Course Objectives

The objectives of the course are:-

1. To increase the understanding of fin fish and shell fish aquaculture
2. To teach about different aquaculture species, their rearing facilities and management by using basic techniques
3. To impart knowledge about site selection and construction of fish farm.
4. To understand the problems and management of fish farm

Learning outcomes.

Upon successful completion of the course, the student will be able to:

- **Illustrate** the basic knowledge of fin fish and shell fish, fisheries and aquaculture
- **IDENTIFY** fish species on the basis of biological characteristics.
- **SOLVE** problems of appropriate site selection, designing and pond construction; selection of suitable fish species for sustainable aquaculture.
- **ANALYZE** the problems of fish pond and solve them by using different strategies.
- **FORMULATE** and prepare aqua feed, induced breeding techniques, diagnosis and control of diseases in commercially important fish species.
- **DEMONSTRATE** and visit the aquaculture sites and individually the drawings of aquaculture facilities, aquatic resources and integrated aquaculture management.

Course Contents:

a. **Introduction of Aquaculture in Pakistan:** Definition, History of Aquaculture, Aquaculture: A global perspective, Status of Aquaculture in Pakistan
b. **Species Group:** Aquatic plants, Fish, Crustaceans, Molluscs
c. **Various Branches of Aquaculture:** Mariculture, Shell fish, Artificial reefs, Oyster farming, Integrated multi-trophic aquaculture
d. **Classification According to Species:** Algaculture, Seaweed farming, Fish farming, Extensive aquaculture, Intensive aquaculture, Geoduck aquaculture, Freshwater Prawn Farming, Shrimp farming, Scallop aquaculture, Aquaculture of Catfish, Aquaculture of Tilapia, Aquaculture of Sea Cucumbers, Aquaculture of Sea Sponges, Aquaculture of Giant Kelp
e. **Aquaculture Systems:** Recirculating Aquaculture System, Organic Aquaculture, Aquaponics
f. **Resource Use and Environmental Issues:** Land use, Water use, Energy use, Feed-fish use, Chemicals, Water pollution, Best management practices

Teaching-Learning Strategies

Teaching will be a combination of class lectures, class discussions, and group work. Short videos /films will be shown on occasion.

Assignments

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

Assessments and Examination

Sessional Work:	25 marks
Midterm Exam:	35 marks
Final term Exam:	40 marks

Books Recommended:

1. Metha, V. 2009. Fisheries and Aquaculture Biotechnology. 2nd Ed. Campus Books International, New Delhi, India.
2. Sharma, O. P. 2009. Handbook of Fisheries and Aquaculture. Agrotech Publishing Academy, Udaipur, New Delhi, India.
3. Stickney, R. R. 2009. Aquaculture: An Introductory Text. CABI Publishing, London, UK.
4. Pandey, B. N., S. Deshpande and P. N. Pandey. 2007. Aquaculture. APH Publishing Corporation, New Delhi, India.
5. Parker, R. O. 2004. Aquaculture Science 4th Ed. Delmar Learning, London, UK.
6. Chakraborty, C. and A. K. Sadhu. 2001. Biology, Hatchery and Culture Technology of Tiger Prawn and Giant Freshwater Prawn. Dya Publishing House, New Delhi, India.
7. Gjedrem T. and Baranski M. 2009. Selective breeding in Aquaculture: An Introduction. Springer, USA
8. NIIR 2003. Hand Book on Fisheries & Aquaculture Technology. Asia Pacific Business Press Inc., Delhi.
9. Pillay, T. V. R. 2002. Aquaculture: Principles and Practices. Blackwell Sciences Limited. UK.
10. Huet, M. and Timmermans, J. (2002). Text book of Fish Culture. Blackwell Science Ltd.
11. Shammi, Q.J. and Bhatnagar, S. 2002. Applied Fisheries, Agro bios, India.
12. Ali, S.S. 1999. Fresh Water Fisher Biology. Naseem Book Depot, Hyderabad.

UZO-522 Introduction of Aquaculture (Lab.) Cr. (1)

Course Objectives

The objectives of the course are:-

5. To increase the understanding of fin fish and shell fish aquaculture
6. To teach about different aquaculture species, their rearing facilities and management by using basic techniques

7. To impart knowledge about site selection and construction of fish farm.
8. To understand the problems and management of fish farm

Learning outcomes.

Upon successful completion of the course, the student will be able to:

- **Illustrate** the basic knowledge of fin fish and shell fish, fisheries and aquaculture
- **IDENTIFY** fish species on the basis of biological characteristics.
- **SOLVE** problems of appropriate site selection, designing and pond construction; selection of suitable fish species for sustainable aquaculture.
- **ANALYZE** the problems of fish pond and solve them by using different strategies.
- **FORMULATE** and prepare aqua feed, induced breeding techniques, diagnosis and control of diseases in commercially important fish species.
- **DEMONSTRATE** and visit the aquaculture sites and individually the drawings of aquaculture facilities, aquatic resources and integrated aquaculture management.

Course Contents:

- Collection and identification of various freshwater fish species
- Visit and studying of fish pond Components.
- Visit to fish hatchery and integrated fish farming.
- Determination of Water quality parameters (Physical, chemical and biological)
- Fish feed ingredients and formulation of fish feed
- Artificial Fish breeding
- Fish market visit
- Visit to fish feed mill
- Visit to head works/reservoirs etc.

Teaching-Learning Strategies

Teaching will be a combination of class lectures, class discussions, and group work. Short videos /films will be shown on occasion.

Assignments

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

Assessments and Examination

Sessional Work:	25 marks
Midterm Exam:	35 marks
Final term Exam:	40 marks

Books Recommended:

1. Metha, V. 2009. Fisheries and Aquaculture Biotechnology. 2nd Ed. Campus Books International, New Delhi, India.
2. Sharma, O. P. 2009. Handbook of Fisheries and Aquaculture. Agrotech Publishing Academy, Udaipur, New Delhi, India.
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