

Semester:	07		
Course Code:	ZOOL 41813		
Course Name:	Aquaculture Management		
Credit Value:	03		
Status:	Compulsory		
Pre-requisite:	ZOOL 32733		
Co-requisites:	None		
Hourly Breakdown:	Theory	Practical	Independent Learning
	30	45	75

Intended Learning Outcomes:

After completion of this course unit, the student will be able to:

1. discuss the strategies of sustainable aquaculture development planning and management,
2. design and manage different aquaculture systems including ponds, tanks, cages and recirculation systems based on scientific knowledge,
3. apply scientific tools and techniques in managing water quality in culture systems and disease incidence of cultured stocks,
4. discuss management strategies applied in culture-based fisheries, and
5. demonstrate knowledge and skills in planning aquaculture, culture-based fisheries and sea ranching programmes with minimum negative environmental impact.

Course Content:

Role and potential of aquaculture in national development, aquaculture development and SDGs, Risks associated with aquaculture and management and mitigation approach. Ways to address challenges of global aquaculture industry, Tanks, ponds, cages and other production units, inlets and outlets. Water quality and management: Inlet and outlet water quality, Recirculating aquaculture systems. Integration of aquaculture with livestock production and agriculture. Aquaculture disease process and disease management: Dynamics and epizootiology of infectious diseases, Disease agents, reservoirs and transmission, mortality curves; Use of biosecurity and biosecurity plans. Use of probiotics in aquaculture; Production of SPF, SPR and SPT shrimp, validation and maintenance of SPF status; Genetic basis for selection of fish for breeding, cross breeding and hybridization. Feed management in aquaculture, supplementary feed formulation, biofloc as a food source in aquaculture. Environmental impacts and their mitigation in aquaculture.

Culture based fisheries and sea ranching: Use of inland water bodies - seasonal and perennial, species selection: stocking and harvesting, legal aspects and challenges; Ranching of sea cucumber, penaeid shrimps, lobsters and molluscs.

Laboratory and field studies: Evaluation of requirements for various aquaculture systems/facilities and performance testing, Quantitative assessment of brood stocks and fingerlings requirement for a culture based fishery, Use of anesthesia for fish in aquaculture, techniques used in fish and shrimp diseases identification, Formulation of supplementary feeds for cultured aquatic species, Use of live feed in aquaculture (eg: *Artemia*, *Chlorella*), Use of water recirculation in aquaculture systems, Field studies at selected fish breeding and training centers and an ornamental fish farm.

Teaching /Learning Methods:

A combination of lectures, laboratory and field practical sessions, computer based learning, self-studies, small group discussions and audio-visual programmes.

Assessment Strategy:

Continuous assessment and end of semester examination. Percentage given for each sub-component indicates the percent contribution to the final marks.

Continuous Assessment 30 %	Final Assessment 70 %		
Details:	Theory 50 %	Practical 20 %	Other -
Field based reports 10 %			
In-class test 10 %			
Practical reports 10 %			

Recommended Readings:

1. Parker, R. (2011). Aquaculture Science, Cengage Learning.
2. Lekang, O. (2013). Aquaculture Engineering, Wiley-Blackwell.
3. Daniel, L. M. & R. Einar (2014). Aquaculture Nutrition: Gut Health, Probiotics and Prebiotics, Wiley-Blackwell.
4. Frederick, K. & P. Mark (2020). Aquaculture Health Management. Academic Press.
5. Ronald, H. (2002). Fish Nutrition, 3rd Edition. Academic Press.
6. Boyd, C. E. & C.S. Tucker (2012). Pond Aquaculture Water Quality Management. Springer Science & Business Media.
7. Sukumar, B. (2008). Water Quality Management for Coastal Aquaculture. Daya Publishing House.