A.S.D GOVT.DEGREE COLLEGE FOR WOMEN (A)

(Re-Accredited NAAC with "B" Grade)

KAKINADA, EAST GODAVARI, A.P, 533002.

DEPARTMENT OF ZOOLOGY AND AQUACULTURE TECHNOLOGY

2018-2019

AQUACULTURE TECHNOLOGY

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AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2018-2019

SEMESTER-I – PAPER-I (Paper Code: AQ1308)

BASIC PRINCIPLES OF AQUACULTURE

Periods: 60 **Max. Marks: 100**

UNIT-I: INTRODUCTION

1-1 Concept of Blue Revolution-History and Definition of Aquaculture
1-2 Scope of Aquaculture at the global Level, India and Andhra Pradesh
1-3 Freshwater aquaculture, brackish water aquaculture, and Mari culture
1-4 Different Aquaculture systems– Pond, Cage, Pen, Running water, Extensive, Intensive &Semi- Intensive Systems and their significance. Monoculture, Polyculture and Mono sex culture systems
1-5 Aquaculture versus Agriculture; Present day needs with special reference to Andhra Pradesh

UNIT-II: POND ECOSYSTEM

2-1 1 General Concepts of Ecology, CarryingCapacityandFoodChains2-
2Loticand lentic systems, streams and springs
2-2 2 Nutrient Cycles in Culture Ponds– Phosphorus, Carbon and Nitrogen
2-3 Importance of Plankton and Benthos in culture ponds, nutrient dynamics and algalblooms2-
4Concepts of Productivity, estimation and improvement of productivity

UNIT-III: TYPES OF FISH PONDS

3-1 1 Classification of ponds based on water resources– spring, rainwater, flood water, well water and water course ponds
3-2 Functional classification of ponds– head pond, hatchery, nursery, rearing, production, stocking and quarantine ponds
3-3 Hatchery design

UNIT- IV: POND PREPARATION

4-1 Important factors in the construction of an ideal fish pond– site selection, topography, nature of the soil, water resources
4-2 Layout and arrangements of ponds in a fish farm
4-3 Construction of an ideal fish pond– space allocation, structure and components of barrage pond

UNIT-V: PONDMANAGEMENTFACTORS

5-1 Need of fertilizer and manure application in culture ponds; Role of nutrients; NPK contents of different fertilizers and manures used in aquaculture; and precautions in their application

5-2 Physico-chemical conditions of soil and water optimum for culture–temperature, depth, turbidity, light, water and shore currents, PH, DOD, CO2, and nutrients; measures to increase oxygen and reduce ammonia &hydrogen sulfide in culture ponds; correction of PH

5-3 Eradication of predators and weed control– advantages and disadvantages of weed, weed plants in culture ponds, aquatic weeds, weed fish, toxins used for weed control and control of predators

PRESCRIBED BOOK(S):

1. Jhingran VG1998.Fish and Fisheries of India. Hindusthan Publishing Corporation, New Delhi
2. Pillay TVR, 1996. Aquaculture Principles and Practices, Fishing News Books Ltd.,London

REFERENCES:

1. Pillay TVR &M.A. Dill, 1979. Advances in Aquaculture. Fishing News Books Ltd.,London
2. Stickney RR 1979. Principles of Warm Water Aquaculture. John Wiley & SonsInc. 1981
3. Boyd CE 1982. Water Quality Management for Pond Fish Culture .Elsivier Scientific Publishing
4. Bose ANet.al., 1991.Costal Aquaculture Engineering. Oxford &IBH Publishing Company

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AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2018-2019

SEMESTER-I PAPER-I (Course Code: AQ1308P)

BASIC PRINCIPLES OF AQUACULTURE

PRACTICAL SYLLABUS

Periods: 24 **Max. Marks: 50**

PRACTICALS: (Any 8as per the local Industry needs)

1. Estimation of Carbonates, Bicarbonates in water samples
2. Estimation of Chlorides in water samples
3. Estimation of dissolved oxygen
4. Estimation of ammonia in water
5. Field visit to nursery, rearing and stocking ponds of aqua farms
6. Field visit to hatchery
7. Study of algal blooms and their control
8. Collection &identification of zooplankton and phytoplankton
9. Study of aeration devices
10. Determination of soil nitrogen and phosphorus
11. Collection and study of aquatic weeds
12. Filed survey of nearby habitat for dietary dependency on and requirement of aqua products

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AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2018-2019

SEMESTER– II PAPER-II (Paper Code: AQ2308)

TITLE- BIOLOGY OF FINFISH& SHELL FISH

Periods: 60 **Max. Marks: 100**

UNIT-I: GENERAL CHARACTERS & CLASSIFICATION OF CULTIVABLE FIN & SHELLFISH

1-1General Characters and classification of fishes, crustaceans and molluscs up to the level of Class.
1-2Fish, Crustaceans and Molluscs of commercial importance
1-3 3 Sense organs of fishes, crustaceans and molluscs
1-4 4 Specialized organs in fishes– electric organ, venom and toxins
1-5 Buoyancy in fishes-swim bladder and mechanism of gas secretion

UNIT-II: FOOD, FEEDING AND GROWTH

2-1 1 Natural fish food, feeding habits, feeding intensity, stimuli for feeding, utilization of food, gut content analysis, structural modifications in relation to feeding habits, for age ratio and food selectivity index
2-2 2 Principles of Age and growth determination; growth regulation, Growth rate measurement–scale method, otolith method, skeletal parts as age indicators
2-3 3 Genetic, biotic &ecological factors in determining he longevity of fishes, length frequency method, age composition, age-length keys, absolute and specific growth, back calculation of length and growth, annual survival rate, asymptomatic length, fitting of growth curve
2-4 Length-weight relationship, condition factor/ Ponderal index, relative condition factor

UNIT-III: REPRODUCTIVE BIOLOGY

3-1 Breeding in fishes, breeding places, breeding habits & places, breeding in natural environment and in artificial ponds, courtship and reproductive cycles
3-2 Induced breeding in fishes
3-4Breedingin shrimp, oysters, mussels, clams, pearl oyster, pila, fresh water mussel and cephalopods

UNIT– IV: DEVELOPMENT

4-1Parental care in fishes, ovo-viviparity, oviparity, viviparity, nest building and brooding
4-2Embryonic and larval development of fishes
4-3Embryonic and larval development of shrimp, crabs and molluscs of commercial importance
4.4Environmental factor saffecting reproduction and development of cultivable aquatic fin & shellfish

UNIT-V: HORMONES & GROWTH

5-1 1 Endocrine system in fishes
5-2 Neuro secretary cells, androgenic gland, ovary, Y- organ, chromatophores, pericardial glands and cuticle.
5-3Molting, molting stages, metamorphosis in crustacean shell fish

PRESCRIBED BOOK(S):

1. Bone Qet al., 1995. Biology of fishes, Blackie academic &professional, LONDON
2. SaxenaAB1996.Life of Crustaceans. Anmol Publications Pvt.Ltd., New Delhi

REFERENCES:

1. Tandon KK & Johal MS1996. Age and Growth in Indian Fresh Water Fishes. Narendra Publishing
2. Raymond T etal., 1990. Crustacean Sexual Biology, Columbia University Press, New York
3. Guil and J.A (ed) 1984. Penaeid shrimps- Their Biology and Management.
4. Barrington FJW1971.Invertebrates: Structure and Function. ELBS
5. Parker F& Haswell 1992. The text book of Zoology, VolI. Invertebrates

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AQUACULTURE TECHNOLOGY BOARD OF STUDIES: 2018-2019

SEMESTER– II PAPER-II (Paper Code: AQ2308P)

BIOLOGY OF FINFISH & SHELLFISH

PRACTICAL SYLLABUS

Periods: 24 **Max. Marks: 50**

PRACTICALS: (Any 8 as per the local Industry needs)

1. Study of mouth parts in herbivorous and carnivorous fishes.
2. Comparative study of digestive system of herbivorous and carnivorous fishes.
3. Length-weight relationship of fishes.
4. Gut content analysis in fishes and shrimp.
5. Mouth parts and appendages of cultivable prawns, shrimps and other crustaceans.
6. Study of eggs of fishes, shrimps, prawns and other crustaceans.
7. Study of oyster eggs.
8. Embryonic and larval development of fish.
9. Study of gonadal maturity and fecundity in fishes and shellfish.
10. Observation of crustacean larvae.
11. Observation of molluscan larvae.
12. Study of nest building and brooding of fishes.