I DEGREE

AQUA CULTURE

SEMESTER - I

2017 - 2018

SRI Y.N.COLLEGE (AUTONOMOUS) NARSAPUR, W.G.DIST.,

AQUACULTURE TECHNOLOGY COURSE SYLLABUS

SEMESTER-I-PAPER-1
BASIC PRINCIPLES OF AQUACULTURE

UNIT-I: INTRODUCTION

1-1 Concept of Blue Revolution – History and definition of Aquaculture
1-2 Scope of Aquaculture at global Level, India and Andhra Pradesh
1-3 Fresh water aquaculture, brackish water aquaculture and mariculture
1-4 Different Aquaculture systems – Pond, Cage, Pen, Running water, Extensinve, Intensive and Semi-Intensive Systems and their siginificance. Monoculture, Polyculture and Monosex culture systems.

UNIT-II: POND ECOSYSTEM

2-1 General Concepts of Ecology, Food Chains
2-2 Lotic and lentic systems, streams and springs
2-3 Importance of Plankton and Benthos in culture ponds.
2-4 Concepts of Productivity, estimation and improvement of productivity.

UNIT-III: TYPES OF FISH PONDS

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

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 Lay out and arrangements of ponds in a fish farm

UNIT-V: POND MANAGEMENT FACTORS

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, (PH, temperature, depth, turbidity, light) to increase oxygen and reduce ammonia & hydrogen sulphide 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.

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2. T.V.V.
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5. K. Uma Rani
6. 23/6
7. L. Prasad
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AQUACULTURE TECHNOLOGY COURSE SYLLABUS

SEMESTER-I-PAPER-1
BASIC PRINCIPLES OF AQUACULTURE

BLUE PRINT (Guidelines to the paper setter)

UNITS	ESSAY QUESTIONS	SHORT QUESTIONS
UNIT-I	2	2
UNIT-II	2	1
UNIT-III	2	2
UNIT-IV	2	1
UNIT-V	2	2
TOTAL	10	8

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AQUACULTURE TECHNOLOGY COURSE SYLLABUS

SEMESTER-I-PAPER-1
BASIC PRINCIPLES OF AQUACULTURE

Time: 3 Hrs. Max.Marks: 75

PART – I

Answer any **Five** of the following. 5x5 = 25 M

1. Cage Culture – పెట్టెల యందు పెంపకము.
2. Food Chains – ఆహారపు గొలుసులు
3. Nursery Ponds – నర్సరీ కుంటలు
4. Soil Characters of Pond – చెరువు యొక్క మృత్తిక లక్షణాలు
5. Manure applications in Culture Ponds – చెరువులయందు ఎరువుల వాడకం
6. P^H – పి.హెచ్.
7. Aquatic Weeds – నీటికలుపు మొక్కలు
8. Weed Fishes – భక్షక చేపలు.

PART – II

Answer any **Five** of the following choosing at least two questions from Section A and Section B. All questions carry equal marks. 5x10 = 50 M

SECTION – A

9. Write an essay on Mono culture and Poly culture.
   ఏక సంవర్ధనము మరియు బహు సంవర్ధనము గూర్చి ఒక వ్యాసము వ్రాయుము.
10. Describe the differences between Lotic and Lentic waters.
    లోటిక్ మరియు లెన్ టిక్ జలాల మధ్య వ్యత్యాసములను తెల్పుము.
11. Give an account of the design and construction of Culture Ponds.
    సంవర్ధన చెరువుల యొక్క డిజైన్ మరియు నిర్మాణమును గూర్చి వివరింపుము.
12. Give an account on Nitrogen Cycle
    నత్రజని వలయము గూర్చి వ్రాయుము.
13. Explain the Fish Hatchery design.
    చేపల హేచరీ డిజైన్ గూర్చి తెల్పుము.

SECTION – B

14. Describe the organic and inorganic fertilizers used in fresh water culture ponds.
మంచినీటి చెరువులయందు సహజ ఎరువు, కృత్రిమ ఎరువుల వాడకమును గూర్చి వివరింపుము.

15. Write an essay on physic-chemical characters of fresh water culture ponds.
సంవర్ధన చెరువుల భౌతిక-రసాయనిక లక్షణాలపై ఒక వ్యాసము వ్రాయుము.

16. Describe the detailed account on Aquatic Weeds and their control in Aqua Culture ponds.
జలసంవర్ధన చెరువులయందు కలుపుమొక్కలను గూర్చి తెలిపి వాటి నివారణ పద్ధతులను వివరింపుము.

17. Write an essay on predatory and weed fishes.
పరభక్షక చేపలు మరియు వీడ్ చేపలను గూర్చి ఒక వ్యాసము వ్రాయుము.

18. Write an account on lay out of a fish farm.
చేపల చెరువు యొక్క లే-అవుట్ గూర్చి వ్రాయుము.

1.

2. T. V. V. Satyam

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6. B-KRM Murthy

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AQUACULTURE TECHNOLOGY COURSE SYLLABUS

SEMESTER-I-PAPER-1

BASIC PRINCIPLES OF AQUACULTURE

PRACTICALS:

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

PRACTICAL MODEL QUESTION PAPER

Time: 3 Hrs. Max.Marks: 50

1. Estimation of DO_2 in the given sample of water and write the procedure adopted. 10 + 5 = 15 M
2. Identify draw and comment on the given spotters 5 x 4 = 20 M

   A, B, C, D, & E
3. Record and Field Note Book 10 + 5 = 15 M

TOTAL: 50 M

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2. P.V.V.
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6. B. Kem 23/6
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I DEGREE

AQUA

CULTURE

SEMESTER - II

2017 - 2018

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I B.Sc., Aquaculture Technology – Under CBCS – Semester II

Paper II, Biology of Fin Fish & Shell Fish

UNIT-I: GENERAL CHARACTERS & CLASSIFICATION OF CULTIVABLE FIN & SHELL FISH.

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

UNIT-II: FOOD, FEEDING AND GROWTH

2-1 Natural fish food, feeding habits, feeding intensity, stimuli for feeding, utilization of food, gut content analysis, structural modifications in relation to feeding habits.
2-2 Principles of Age and growth determination; growth regulation, Growth rate measurement – scale method, otolith method, skeletal parts as age indicators.
2-3 Genetic, biotic & ecological factors in determining the longevity of fishes.
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.
3-2 Induced breeding in fishes

UNIT-IV: DEVELOPMENT.

4-1 Parental care in fishes, ovo-viviparity, oviparity, viviparity, nest building and brooding .
4-2 Embryonic and larval development of fishes
4-3 Embryonic and larval development of shrimp.
4-4 Environmental factors affecting reproduction and development of cultivable fin fishes.

UNIT-V: HORMONES & GROWTH

5-1 Endocrine system in fishes.
5-2 Neurosecretary cells, ovary and chromatophores.
5-3 Molting, molting stages, metamorphosis in crustacean shell fish.

REFERENCES:

1. Tandon KK & Johal MS 1996. Age and Growth in Indian Fresh Water Fishes. Narendra Publishing House, New Delhi.
2. Raymond T et al., 1990. Crustacean Sexual Biology, Columbia University Press, New York.
3. Guiland J.A (ed) 1984. Penacid shrimps. Their Biology and Management.
4. Barrington FJW 1971. Invertebrates: Structure and Function. ELBS
5. Parker F & Haswell 1992. The text book of Zoology, Voll. Invertebrates (eds. Marshal AJ & Williams). ELBS & Mc Millan & Co.

BLUE PRINT FOR QUESTION PAPER SETTERS:

UNITS	SHORT ANSWERS 5 MARKS	ESSAY QUESTIONS 10 MARKS	
		SECTION A	SECTION B
Unit I	2	2	
Unit II	2	2	
Unit III	1	1	1
Unit IV	1		2
Unit V	2		2
Total Marks Including Choice	8 x 5 = 40	5 x 10 = 50	5 x 10 = 50

Note: The question paper setters are requested to kindly adhere to the format given in the above data.

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I B.Sc., Aquaculture Technology – Semester II

Paper II, Biology of Fin Fish & Shell Fish

Time: 3 Hrs. Max.Marks: 75

PART – I

Answer any **FIVE** of the following. 5 x 5 = 25 M
ఈ క్రింది ప్రశ్నలనుండి ఐదింటికి జవాబులు వ్రాయుము.

1. Chanos Chanos - చానాస్ చానాస్
2. Eye of Fish – చేప యొక్క కన్ను.
3. Feeding Habits of Fishes – చేపల యొక్క ఆహారపు అలవాట్లు.
4. Otolith Method – Growth Rate Measurement – ఆటోలిత్ – పెరుగుదల కొలత.
5. Breeding Habits in Fishes – చేపల ప్రత్యుత్పత్తి అలవాట్లు.
6. Parental Care in Fishes – చేపల యందు సంతానపాలన.
7. Ovary – ఓవరీ.
8. Moulting - కుబుస విసర్జన.

PART – II

Answer any **FIVE** questions choosing at least **Two** questions from each Section A & B. Draw a neat Labeled Diagram wherever necessary. All questions carry equal marks. 5 x 10 = 50 M

ఏదైనా ఐదు ప్రశ్నలకు సమాధానము వ్రాయుము. సెక్షన్ 'ఎ' మరియు సెక్షన్ 'బి' ల నుండి కనీసం రెండు ప్రశ్నలను ఎంచుకొని మొత్తం ఐదు ప్రశ్నలకు జవాబులు వ్రాయుము. అవసరమైనచోట భాగాలు గుర్తిస్తూ చిత్ర పటములను గీయవలెను. అన్ని ప్రశ్నలకు మార్కులు సమానము. 5 x 10 = 50 M

SECTION – A

9. Describe the General characters and Classification of Bony fishes up to classes.
అస్థి చేపలయొక్క సామాన్య లక్షణములను తెల్పి తరగతుల వరకు వర్గీకరింపుము.

10. Describe the important characters of any two commercially important fishes.
ఆర్థిక ప్రాముఖ్యము కల ఏవైనా రెండు చేపల యొక్క ముఖ్య లక్షణములను తెల్పుము.

11. Write an essay on feeding adaptations in fishes.
చేపల యందు ఆహారం తినడానికి చూపు అనుకూలనాలను గూర్చి ఒక వ్యాసము వ్రాయుము.

12. Write a detailed account on length – weight relationship of fishes.
చేపల యొక్క పొడవు-బరువు సంబంధమును గూర్చి విపులముగా వివరింపుము.

13. Describe the different breeding habits of fishes.
చేపల యొక్క వివిధ ప్రత్యుత్పత్తి అలవాట్లను గూర్చి వివరింపుము.

SECTION - B

14. Write an essay on induced breeding technique in fishes.
చేపల యందు ప్రేరేపితి ప్రజననము గూర్చి ఒక వ్యాసము వ్రాయుము.

15. Describe the larval development in fishes.
చేపల యొక్క లార్వాల అభివృద్ధిని గూర్చి వివరింపుము.

16. Write an essay on endocrine glands in fishes.
చేపల యొక్క వినాళ గ్రంథులను గూర్చి ఒక వ్యాసము వ్రాయుము.

17. Describe the Neurosecretary cells in fishes.
చేపల యొక్క నాడీ శ్రావక కణాలను గూర్చి వివరింపుము.

18. Describe the Chromatophores in fishes .
చేపల యొక్క క్రొమోటోఫోరులను గూర్చి వివరింపుము.

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2. T.V.V.

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5. K. Uma Devi

6. B. KRMurthy

7. L. Bagal

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DEPARTMENT OF ZOOLOGY & FISHERIES

AQUACULTURE TECHNOLOGY COURSE

Semester – II

Biology ~~BASIC~~ OF FIN FISH & SHELL FISH - Paper - II

PRACTICALS :

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.
5. Mouth parts and appendages of cultivable prawns.
6. Study of eggs of fishes, shrimps, prawns.
7. Embryonic and larval development of fish.
8. Study of gonads maturity and fecundity in fishes.
9. Observation of Crustacean larvae.
10. Observation of Molluscan larvae.

PRACTICAL MODEL QUESTION PAPER

Time : 3 Hrs. Max. Marks : 50

1.	Identify the gut contents of given specimen and analyse & note down the gut contents and draw the diagrams.	10 + 5 = 15M
2.	Identify, draw and comment on the given spotters A, B, C, D & E	5 x 3 = 15M
3.	Length - Weight relationship of given specimens	1 x 10 = 10M
4.	Record and Viva	5 + 5 = 10M
	TOTAL :	50M

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