SRI VENKATESWARA UNIVERSITY: TIRUPATI

IV SEMESTER

Course No.: 9 - Fish Health Management

credits : 3

COURSE OUTCOMES:

1.Provide students with knowledge about fish diseases and pathological aspects of diseases.
2.Learn about Fungal, Viral and Bacterial diseases of finfish.
3.Gain knowledge of Nutritional deficiency related diseases and antibiotic and chemotherapeutics.
4.Understand and learn the importance of diagnostic tools in identification of diseases and application and development of vaccines.

UNIT I: Pathology and parasitology

1-1 Introduction to fish diseases –Definition and categories of diseases – Disease and environment
1-2 Disturbance in cell structure – changes in cell metabolism, progressive and retrogressive tissue changes, types of degeneration, infiltration, necrosis, cell death and causes
1-3 Atrophy, hypertrophy, neoplasms, inflammation, healing and repair

UNIT II: Fungal and viral Diseases of fin fish.

2-1 Fungal diseases (both of shell and finfish) – Saprolegniosis, brachiomycosis, ichthyophorus diseases – Lagenidium diseases – Fusarium disease, prevention and therapy
2-2 Viral diseases – Emerging viral diseases in fish, haemorrhagicscepticemia, spring viremia of carps, infectious hematopoietic necrosis in trout, infectious pancreatic necrosis in salmonids, swim-bladder inflammation in cyprinids, channel cat fish viral disease, prevention and therapy

UNIT III: bacterial Diseases of fin fish.

2-3 Bacterial diseases – Emerging bacterial diseases, aeromonas, pseudomonas and vibrio infections, columnaris, furunculosis, epizootic ulcerative syndrome, infectious abdominal dropsy, bacterial gill disease, enteric red mouth, bacterial kidney disease, proliferative kidney disease, prevention and therapy

UNIT IV: Protozoan Diseases of fin fish.

Protozoan diseases: Ichthyophthiriasis(White spot Disease),Costiasis,Whirling disease

UNIT V: Nutritional diseases

4-1 Nutritional pathology – lipid liver degeneration, Vitamin and mineral deficiency diseases. Aflatoxin and dinoflagellates.
4-2 Antibiotic and chemotherapeutics.Nutritional cataract.Genetically and environmentally induced diseases.

Verified and Approved by Dr.M.VANIHOD & BOS Chairperson (Zoology)

IV SEMESTER

Course No.: 9 - Fish Health Management

credits :1

1. Enumeration of Bacteria by TPC Method

2. Enumeration of total Coli forms

3. Observation of gross pathology and external lesions of fish with reference to the common diseases
in aquaculture

4. Examination of pathological changes in gills and gut lumen, lymphoid organ, muscles and nerves of fish

5. Collection, processing and analysis of data for epidemiological investigations of viral diseases

6. Bacterial pathogens – isolation, culture and characterization

7. Identification of parasites in fishes: Protozoan, Helminths, Crustaceans

8. Estimation of dose, calculation of concentration, methods of administration of various Chemo-therapeutics to fish and shell fish

9. Estimation of antibiotics used in aquaculture practices

PRESCRIBED BOOK(S):

1. Shaperclaus W. 1991 Fish Diseases- Vol. I & II.Oxonian Press Pvt.ltd
2. Roberts RJ 1989. Fish pathology.BailliereTindall, New York
3. Lydia Brown 1993. Aquaculture for veterinarians - fish husbandry and medicine, Pergamon Press. Oxford

REFERENCES:

1. Shankar KM & Mohan CV. 2002. Fish and Shellfish Health Management. UNESCO Publications, Sindermann CJ. 1990
2. Walker P &Subasinghe RP. (Eds.). 2005 Principal Diseases of Marine Fish and Shellfish.Vols. I, II. 2nd Ed. Academic Press
3. DNA Based Molecular Diagnostic Techniques: Research Needs for Standardization and Validation of the Detection of Aquatic Animal Pathogens and Diseases.FAO Publications, Wedmeyer G, Meyer F P & Smith L. 1999.
4. Bullock G et. al., 1972 Bacterial diseases of fishes. TFH publications, New Jersey
5. Post G 1987. Text book of Fish Health. TFH publications, New Jersey
6. Johnson SK 1995. Hand book of shrimp diseases. Texas A & M University, Texas

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V SEMESTER

Course No.: 9 - Fish Health Management
MODEL QUESTION PAPER

SECTION – A

Answer any five of the following 5 X 4 = 20

1.
2.
3.
4.
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7.
8.

SECTION – B

Answer any FIVE of the following 5 X 10 = 50

UNIT – I

9. a .

OR

b

UNIT – II

10.a OR

b

UNIT – III

11.a. .

OR

b

UNIT – IV

12 a.

OR

b. .

UNIT – V

13.a.

OR

b.

IV SEMESTER

Course No.: 9 - Fish Health Management

MODEL PRACTICAL QUESTION PAPER

1. EXPERIMENT -1	20X1= 20
2. EXPERIMENT-2.	15X1 =15
3. Viva voce	5 x1 = 05.
	10 x 1 =10
4. Certified Record	
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	50 Marks

IV SEMESTER

Course No.:10 - Shrimp Health Management

credits :1

COURSE OUTCOMES:

1.Provide students with knowledge about shrimp diseases and pathological aspects of diseases.
2.Learn about Fungal, Viral and Bacterial diseases of shellfish.
3.Gain knowledge of Nutritional deficiency related diseases and antibiotic and chemotherapeutics.
4.Understand and learn the importance of diagnostic tools in identification of diseases and application and development of vaccines.
5.To know about production of disease free seeds and good feed management.

Syllabus

UNIT I: Viral Diseases of shell fish (Symptoms, Treatment and Prophylaxis)

1-1 Major shrimp viral diseases – Bacculo virus penaeii, MonodonBacculovirus

1-2 Bacculoviralmidgut necrosis, Infectious hypodermal and haematopoietic necrosis virus, Hepatopancreaticparvo like virus

1-3 Yellow head bacculovirus, white spot bacculovirus.

UNIT II: Bacterial Diseases of shell fish(Symptoms, Treatment and Prophylaxis)

2.1 Bacterial diseases of shell fish – aeromonas, pseudomonas and vibrio infections
2.2Luminous bacterial disease, filamentous bacterial disease. Prevention and therapy

UNIT III: Protozoan Diseases of shell fish (Symptoms, Treatment and Prophylaxis)

3-1 Protozoan diseases- Ichthyophthiriasis, Costiasis,
3-2Whirling diseases, trypanosomiasis

UNIT IV: Health management

4-1 Diagnostic tools – immune detection- DNA/RNA techniques, General preventive methods and
prophylaxis.Applications and development of vaccines.
4-2 Quarantine – Significance, methods and regulations for transplants.

UNIT V: Production of disease free seeds

5-1 Production of disease-free seeds.Evaluation criteria of healthy seeds.
5-2Good Feed management for healthy organisms, Zero water exchange, Probiotics in

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IV SEMESTER

Course No.:10 - Shrimp Health Management
credits :1

1. Enumeration of Bacteria by TPC Method
2. Observation of gross pathology and external lesions of fish and prawn with reference to the common diseases in aquaculture
3. Examination of pathological changes in gut lumen, hepato-pancrease, lymphoid organ, muscles and nerves of prawn and shrimp
4. Collection, processing and analysis of data for epidemiological investigations of viral diseases
5. Bacterial pathogens – isolation, culture and characterization
6. Antibiograms – preparation and evaluation
7. Molecular and immunological techniques; Biochemical tests; PCR; ELISA; Agglutination test; Challenge tests; Purification of virus for development of vaccines (Demonstration at institutes/labs)
8. Estimation of dose, calculation of concentration, methods of administration of various chemotherapeutics to fish and shell fish
9. Estimation of antibiotics used in aquaculture practices
10. Estimation of probiotics used in aquaculture.

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IV SEMESTER

Course- 10. Shrimp Health Management
MODEL QUESTION PAPER

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Answer any five of the following 5 X 4 = 20

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SECTION – B

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UNIT – I

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OR

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UNIT – II

10.a OR

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UNIT – III

11.a. .

OR

b

UNIT – IV

12 a.

OR

b. .

UNIT – V

13.a.

OR

b.

IV SEMESTER

Course- 10. Shrimp Health Management

MODEL PRACTICAL QUESTION PAPER

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4. Certified Record	
	10 x 1 =10
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	50 Marks

IV SEMESTER

Course No.: 11 - Fish nutrition & Feed technology

credits :3

Course outcomes:

1. Understand Nutritional requirements of cultivable fishes and factors affecting energy partitioning and feeding.
2. Know different types of feed and FCR and different types of feeders
3. Gain Knowledge of Feed manufacture and storage methods of feeds
4. Understand the value of Feed additives and Non-Nutrient ingredients.
5. To create awareness of different nutritional deficiency and importance of natural and supplementary feeds and balanced diet.

UNIT-I: Nutritional requirements of cultivable fish

1-2 Essential amino acids and fatty acids, protein to energy ratio, nutrient interactions and protein sparing effect

1.3 Dietary sources of energy, effect of ration on growth, determination of feeding rate, check tray

UNIT-II: Forms of feeds & Feeding methods

2-1 Fed conversion efficiency, feed conversion ratio and protein efficiency ratio

2-2 Wet feeds, moist feeds, dry feeds, mashes, pelleted feeds, floating and sinking pellets, advantages of pelletization

2-3 Manual feeding, demand feeders, automatic feeders, surface spraying, bag feeding and tray feeding

UNIT-III: Feed manufacture & Storage

3-1 Feed ingredients and their selection, nutrient composition and nutrient availability of feed ingredients

3-2 Feed formulation – extrusion processing and steam pelleting, grinding, mixing and drying, pelletization, and packing

3-3 Water stability of feeds, farm made aqua feeds, micro-coated feeds, micro-encapsulated feeds and micro-bound diets

3-4 Microbial, insect and rodent damage of feed, chemical spoilage during storage period and proper storage methods.

UNIT-IV: Feed additives & Non-nutrient ingredients

4-1 Binders, anti-oxidants, probiotics

4-2 Feed attractants and feed stimulants

4-3 Enzymes, hormones, growth promoters and pigments

4-4 Anti-metabolites, afflatoxins and fiber.

UNIT-V: Nutritional Deficiency in Cultivable fish

5-1 Protein deficiency, vitamin and mineral deficiency symptoms
5-2 Nutritional pathology and ant-nutrients
5-3 Importance of natural and supplementary feeds, balanced diet.

IV SEMESTER

Course No.:11 - Fish nutrition & Feed technology

Practical Syllabus

credits :1

1. Estimation of protein content in aquaculture feeds
2. Estimation of carbohydrate content in aquaculture feeds
3 Estimation of lipid content in aquaculture feeds
4. Estimation of ash in aquaculture feed
5. Study of water stability of pellet feeds
6. Feed formulation and preparation in the lab
7. Study of binders used in aquaculture feeds
8. Study of feed packing materials
9. Study of physical and chemical change during storage
10.Study on physical characteristics of floating and sinking feeds
11.Visit to a aqua-feed production unit

PRESCRIBED BOOK(S):

1.HALVER JE 1989. Fish nutrition. Academic press, San diego

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IV SEMESTER
Course No.:11 - Fish nutrition & Feed technology
MODEL QUESTION PAPER

SECTION – A

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UNIT – II

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UNIT – III

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UNIT – IV

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OR

b. .

UNIT – V

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OR

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IV SEMESTER

Course No.:11 - Fish nutrition & Feed technology

MODEL PRACTICAL QUESTION PAPER

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