

### **Course Objectives**

The objectives of the course are:-

1. To impart knowledge about all aspects of fish health management, prophylactic measures and methods of treatment.
2. To understand various types of infectious and non-infectious fish diseases and control.
3. To learn about various pathogens and their modes of action causing fish disease.

### **Learning outcomes:**

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

1. **Understand** the mechanism of disease occurrence in natural and captive environment
2. **Generalize** elements of fish health, bio-security and disease management.
3. **Identify** types of fish diseases, their treatment and mitigation measures.
4. **Monitoring** and record keeping of infectious and non-infectious fish diseases.
5. **Demonstrate** conditions and husbandry practices to avoid fish diseases.

### **Course Contents:**

1. Introduction to fish health management.

2. Elements of fish health management
3. General husbandry procedures, feeding, fish handling.
4. Facility and equipment management: overview of facility, layout plan, management of facility, management of equipment.
5. Bio-security and mitigation measures: equipment maintenance and disinfection, mitigation disease spread from infected or diseased fish.
6. Disease emergencies: fish disease outbreaks, fish health emergency procedures, determining the cause of outbreaks.
7. Monitoring and record keeping: fish health records, feeding, fish monitoring, water quality monitoring, fish production records, treatment records.
8. Common signs of diseased fish, modern techniques for investigation of disease.
9. Kinds of diseases: non-infectious diseases, infectious diseases, virus borne diseases, bacterial diseases, fungal diseases, fish vaccination.
10. Preventive measures, control of fish disease, disease resistance.
11. Methods of treatments, drug metabolism in fish, routes of drug administration, oral medication, injections.

### **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. DevashishKar. 2015. Epizootic Ulcerative Fish Disease Syndrome, ELSEVIER.
2. Patrick T. K. Woo, David W. Bruno Gregory. 2014. Diseases and Disorders of Finfish in Cage Culture. CABI Publishing.
3. P. T. K. Woo, John F. Leather land, David W. Bruno. 2011. Fish diseases and Disorders. CABI Publishing.
4. Fish diseases and disorders, 2004. Leather land, J.F. and Woo, P. T. K. CABI publishing
5. Leather land, J.F. and Woo, P.T.K. 2004. Fish Diseases and Disorders. Vol.2. Non-Infectious Disorders. CABI Publishing.
6. Woo, P.T.K. and Bruno, D.W. 2003. Fish Disease and Disorders. Vol. 3. Viral, Bacterial and Fungal infections. CABI Publishing.
7. Shammi, Q.J. and Bhatnagar, S. 2002. Applied Fisheries, Agro bios, India.
8. Ali, S.S. 1999. Fresh Water Fisher Biology. Naseem Book Depot, Hyderabad.

## **UZO-470 Fish Health Management (Lab.)**

**Cr. (1)**

### **Course Objectives**

The objectives of the course are:-

1. To impart knowledge about all aspects of fish health management, prophylactic measures and methods of treatment.
2. To understand various types of infectious and non-infectious fish diseases and control.
3. To learn about various pathogens and their modes of action causing fish disease.

### **Learning outcomes:**

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

1. Collection of disease fish samples and identification of potential pathogens
2. Learn techniques of disease fish sample preservation and diagnosis
3. Generalize elements of fish health, bio-security and disease management.
4. Identify types of fish diseases, their treatment and mitigation measures.
5. Monitoring and record keeping of stressors, infectious and non-infectious fish diseases.
6. Collection of fish blood and studying hematology and serological parameters.
7. Demonstrate conditions and husbandry practices to avoid fish diseases.

### **Course contents:**

1. Collection and studying of disease fish samples.
2. Fish dissection.
3. Water quality parameters.
4. Dis-infection methods.
5. Fish treatment methods, oral medication, injection, clinical work-up.
6. Fish biopsy techniques.
7. Fish diseases diagnosis.
8. Fish hematology.
9. Blood smears 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. DevashishKar. 2015. Epizootic Ulcerative Fish Disease Syndrome, ELSEVIER.
2. Patrick T. K. Woo, David W. Bruno Gregory. 2014. Diseases and Disorders of Finfish in Cage Culture. CABI Publishing.
3. P. T. K. Woo, John F. Leather land, David W. Bruno. 2011. Fish diseases and Disorders. CABI Publishing.
4. Fish diseases and disorders, 2004. Leather land, J.F. and Woo, P. T. K. CABI publishing
5. Leather land, J.F. and Woo, P.T.K. 2004. Fish Diseases and Disorders. Vol.2. Non-Infectious Disorders. CABI Publishing.
6. Woo, P.T.K. and Bruno, D.W. 2003. Fish Disease and Disorders. Vol. 3. Viral, Bacterial and Fungal infections. CABI Publishing.
7. Shammi, Q.J. and Bhatnagar, S. 2002. Applied Fisheries, Agro bios, India.
8. Ali, S.S. 1999. Fresh Water Fisher Biology. Naseem Book Depot, Hyderabad.