

Syllabus
MAR 554 - DISEASES OF AQUATIC ORGANISMS
(3 credits)

Instructors

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This course is designed to expose students to fundamental and current issues pertaining to host/pathogen interactions in marine environment. By the end of this course, students should have a basic understanding of disease processes in aquatic organisms; knowledge of the tools used for disease diagnosis; and an appreciation of disease management tools available today. This course will emphasize the role of the environment as an important player in infectious and non-infectious diseases. The specific subjects that will be covered are listed on the next page.

READINGS

There is no applicable textbook (course relatively broad) but reading material will be posted online (Blackboard), distributed in class, or made available on reserve in the library. Readings include but are not limited to:

Asia Diagnostic Guide to Aquatic Animal Diseases, FAO Fisheries Technical Paper 402/2, freely available at: <http://www.fao.org/DOCREP/005/Y1679E/Y1679E00.HTM>

A review of the main bacterial fish diseases in mariculture systems, *Aquaculture* 246, 2005 p 37-61.

Diseases of Fish, 2001. R.B. Moeller

Systemic Pathology of Fish, 2006. H.G. Ferguson, Chapters 1-5, 11, 14.

Host-Parasite Interactions, 2004. G.F. Wiegertjes and G. Flik, Chapters 4-8.

The Immune Response, 2006. T.W. Mak and M.E. Saunders, Chapters 1-4 and 20-22.

Fish Disease Diagnosis and Treatment, 1996. E.J. Noga, p 19-215.

CLASS AND ASSIGNMENTS

Weekly classes will involve two 80 min lectures. Two assignments will be also requested on hot topics in the field of Aquatic Animal Health; the first topic will be selected by the instructors while the second topic will be chosen by each student (in coordination with the instructor). The students will give an oral presentation based on either one of their written reports. Overall, students will be encouraged to provide critical evaluation of each subject matter and identify areas where additional scientific knowledge could or should be generated by research.

EXAMS AND GRADING

Assessment breakdown:		Grade	Lowest Cutoff
Mid term Exam	30%	A	93
Final Exam	30%	A-	90
Hot topic reports	30% (15% each)	B+	87
Oral presentation	10%	B	83
		B-	80
		C+	77
		C	73
		C-	70

SUBJECTS COVERED

Session

I. Introduction

1. Class orientation, Introduction to disease, Basic disease terminology
2. The disease triad (Host/Pathogen/Environment)
3. Basic principles of pathology and epidemiology
4. Diagnostic tools (microscopy, immuno-detection and DNA/RNA techniques)
5. Introduction to viral, bacterial and fungal diseases
6. Invertebrate defense system
7. Vertebrate immunity

II. Major diseases of aquatic organisms

8. Diseases of bivalve mollusks
9. Bivalve case studies: bacterial diseases (clam brown ring disease, juvenile oyster disease)
10. Bivalve case studies: protozoan parasites (Dermo, MSX and QPX)
11. Bacterial pathogens of finfish and crustaceans (Furunculosis, Vibrio spp., shell disease, etc.)
12. Viral pathogens of finfish and crustaceans (ISA, nodavirus, VHSV, IHNV, shrimp viruses, etc.)
13. Protozoan and Myxozoan parasites of crustaceans
14. Protozoan and Myxozoan parasites of finfish
15. [Mid-term exam](#)
16. Metazoan Parasites Part I (Helminthes, etc.)
17. Metazoan Parasites Part II (Copepoda)
18. Non infectious diseases
19. Tumors and cancers of aquatic organisms

III. Issues in Diseases of Aquatic Organisms

20. Aquatic diseases and public health
21. Impact of natural environmental factors on diseases
22. Impact of human activities on diseases
23. Aquatic diseases and exotic species
24. Disease consideration in shellfish restoration
25. Disease management
26. Advances in aquatic animal disease Part I (vaccination, probiotics)
27. Advances in aquatic animal disease Part II (selective breeding, genetic engineering)
28. Student presentations
29. [Final exam](#)