

FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL¹

UGPC APPROVAL _____
 UFS APPROVAL _____
 SCNS SUBMITTAL _____
 CONFIRMED _____
 BANNER POSTED _____
 CATALOG _____

DEPARTMENT: BIOLOGICAL SCIENCES

COLLEGE: COLLEGE OF SCIENCE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX _____ PCB _____ COURSE NUMBER 6776 LAB CODE (L or C) _____

(TO OBTAIN A COURSE NUMBER, CONTACT MJENNING@FAU.EDU)

COMPLETE COURSE TITLE: Histology of Fishes and Aquatic Invertebrates

CREDITS²: 4

TEXTBOOK INFORMATION: 1. Bancrofts Theory and Practice of Histological Techniques 2012, 7th edition. Elsevier Health Sciences, UK ISBN # 978-0-7020-4226-3 2. USFWS CD Rom (photomicrographs and text), Fish Histology and Histopathology Manual, Mumford et al. 2007, Version 4; also available online for download at: http://training.fws.gov/EG/Resources/Fish_Histology/histology.html 3. Atlas of Tilapia Histology, Morrison et al, World Aquaculture Society 4. Histological Techniques for Marine Bivalve Mollusks: Update; NOAA Technical Memorandum NOS NCCOS 27 Update. 2006; Available online at: <http://ccma.nos.noaa.gov/publications/histopathmemofinal.pdf> 5. Histological Techniques for Marine Bivalve Mollusks and Crustaceans, Second edition 2004. NOAA Technical Memorandum NOS NCCOS 5 6. A Handbook of Normal Penaeid Shrimp Histology. Bell and Lightner, 1988. World Aquaculture Soc. Baton Rouge, LA, USA pp. 114.

GRADING (SELECT ONLY ONE GRADING OPTION): REGULAR SATISFACTORY/UNSATISFACTORY _____

COURSE DESCRIPTION, NO MORE THAN THREE LINES: An introduction to basic histology techniques and interpretation of normal and disease states of marine fish and invertebrates.

PREREQUISITES*: Graduate Status

COREQUISITES*:

REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:

* PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: PH.D. IN THE RELEVANT FIELD

Faculty contact, email and complete phone number:
 Dr. Susan Laramore
 slaramo1@hbol.fau.edu
 (772) 242-2525

Please consult and list departments that might be affected by the new course and attach comments.³

Approved by:

Department Chair: [Signature]

College Curriculum Chair: [Signature]

College Dean: [Signature]

UGPC Chair: [Signature]

Graduate College Dean: [Signature]

UFS President: _____

Provost: _____

Date:

02/28/2014

02/28/2014

02/28/2014

2/28/2014

3/2/14

1. Syllabus must be attached; see guidelines for requirements: www.fau.edu/provost/files/course_syllabus.2011.pdf

2. Review Provost Memorandum: Definition of a Credit Hour www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf

3. Consent from affected departments (attach if necessary)

Course Syllabus for Histology of Fishes and Aquatic Invertebrates

1. Course title/number, number of credit hours

Histology of Fishes and Aquatic Invertebrates – PCB 6776 – 4 credit hours

2. Course prerequisites

Graduate status

3. Course logistics

- a. Spring 2015
- b. Notation if online course – N/A
- c. Class location and time (if classroom-based course) – To be determined

4. Instructor contact information

Lead Instructor:

Dr. Susan Laramore (772-242-2525) slaramo1@hboi.fau.edu
Lab II Building Room #104

Instructor Office Hours:

Laramore: Mon 11-12 am, Fri 11-12 am and by appointment
All other instructors by appointment

5. TA contact information (if applicable)

N/A

6. Course description

This course teaches basic histological techniques and will involve interpretation of the normal histology of fish, bivalves, and crustaceans, as well as the morphological and functional changes that occur in tissues during disease. The course will consist of both lecture and lab. The lab portion of the class will consist of training in routine paraffin histology and histochemistry.

7. Course objectives/student learning outcomes

This course aims to introduce students to the fundamentals of histopathology and how it can be used to identify common pathological (disease) issues in fish and aquatic invertebrates.

Students will be able to identify organs, tissues and cell types in normal histological specimens, identify common pathological conditions in fish and aquatic invertebrates, understanding paraffin tissue processing methods and the relevance of histopathology for research and diagnostics. At the end of this course students will be able to process tissues and produce slides for histological examination of fish and shellfish.

8. Course evaluation method

There will be a midterm exam, accounting for 30% of the student's cumulative performance, a final exam that accounts for 30% of the cumulative performance, a student produced slide portfolio that accounts for 20% of the cumulative performance and the remaining 20% will be based on class presentations and laboratory participation. The overall grade in the course is derived from the cumulative performance according to the following table.

9. Course grading scale

Cumulative Performance	Grade
>94%	A
>90% - 94%	A-
>87% - 90%	B+
>83% - 87%	B
>80% - 83%	B-
>75% - 80%	C+
>65% - 75%	C
>60% - 65%	C-
>57% - 60%	D+
>53% - 57%	D
>50% - 53%	D-
<50%	F

10. Policy on makeup tests, late work, and incompletes

If a student cannot attend an exam or hand in a homework project on time due to circumstances beyond their control then the instructor may assign appropriate make-up work. Students will not be penalized for absences due to participation in University-approved activities, including athletic or scholastics teams, musical and theatrical performances, and debate activities. These students will be allowed to make up missed work without any reduction in the student's final course grade. Reasonable accommodation will also be made for students participating in a religious observance. Also, note that grades of Incomplete ("I") are reserved for students who are passing a course but have not completed all the required work because of exceptional circumstances. A grade of "I" will only be given under certain conditions and in accordance with the academic policies and regulations put forward in FAU's University Catalog. The student must show exceptional circumstances why requirements cannot be met. A request for an incomplete grade has to be made in writing with supporting documentation, where appropriate.

11. Special course requirements (if applicable): N/A

12. Classroom Etiquette Policy: University policy on the use of electronic devices states: "In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions." You may be asked to leave the class session for noncompliance.

13. Student Honor Policy: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University

community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001 at http://www.fau.edu/regulations/chapter4/Reg_4.001_5-26-10_FINAL.pdf

Cheating is a serious offense. If you are caught cheating, you will receive an F in the course. In addition, you will be referred to the Dean of Student Services and charged with an academic crime. Test procedures and rules will be stated at the beginning of each exam.

14. Disabilities Policy: In compliance with the Americans with Disabilities Act (ADA), students who require special accommodation due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) -- in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585) and follow all OSD procedures.

15. Required texts/readings

1. Bancrofts Theory and Practice of Histological Techniques 2012, 7th edition. Elsevier Health Sciences, UK ISBN # 978-0-7020-4226-3
2. USFWS CD Rom (photomicrographs and text), Fish Histology and Histopathology Manual, Mumford et al. 2007, Version 4; also available online for download at: http://training.fws.gov/EC/Resources/Fish_Histology/histology.html
3. Atlas of Tilapia Histology, Morrison et al, World Aquaculture Society
4. Histological Techniques for Marine Bivalve Mollusks: Update; NOAA Technical Memorandum NOS NCCOS 27 Update. 2006; Available online at: <http://ccma.ncs.noaa.gov/publications/histopathtechmemofinal.pdf>
5. Histological Techniques for Marine Bivalve Mollusks and Crustaceans, Second edition 2004. NOAA Technical Memorandum NOS NCCOS 5
6. A Handbook of Normal Penaeid Shrimp Histology. Bell and Lightner, 1988. World Aquaculture Soc. Baton Rouge, LA, USA pp. 114.

16. Supplementary/recommended readings (optional)

1. Biology of the Hard Clam, Kraeuter and Castagna, 1st edition, 2001
2. Systemic Pathology of Fish, Ferguson, 2nd edition, 2006
3. Wheater's Functional Histology, 4th Edition, Young and Heath, Churchill/Livingstone, 2000
4. Histology and Cell Biology: An Introduction to Pathology, Kierszenbaum, 3rd edition, 2011.
5. Fish Disease, Diagnosis and Treatment, 2nd edition, Noga 2010.
6. Fish Pathology, Roberts and Saunders, 4th Edition 2012.
7. A Handbook of Shrimp Pathology and Diagnostic Procedures for Diseases of Penaeid Shrimp. Lightner, 2nd Edition 2001, World Aquaculture Soc., Baton Rouge, Louisiana, USA, pp.305. Also Available on CD-ROM
8. Histology text: Humason, G. 1997. Animal Tissue Techniques. Fifth Edition. W. H. Freeman & Co. San Francisco or Sheehan, D. C. and B. B. Hrapchak. 1987. Second Edition. Theory and Practice of Histotechnology. The C. V. Mosby Co. St. Louis.

17. Course topical outline

- Week 1: Lecture: Introduction to histopathology, microscopes
Assignments: Readings from 1.
Lab: Fixation procedures for routine histology, using the compound microscope
- Week 2: Lecture: Tissue types
Assignments: Readings from 1.
Lab: Microscopic review of tissue types
- Week 3: Lecture: Pathology and Immunology
Assignments: Readings TBD

- Lab: Processing and embedding fish tissue
- Week 4: Fish Anatomy and Physiology
Assignments: Readings from 2 and 3.
Lab: Normal fish histology, sectioning
- Week 5: Fish gills and circulatory system
Assignments; Readings from 2 and 3.
Lab: Normal fish histology, sectioning
- Week 6: Fish Nervous system
Assignments: Readings from 2 and 3.
Lab: Abnormal fish histology, standard H& E staining and mounting
- Week 7: MidExam; Fish Digestive System
Assignments: Reading from 2 and 3.
Lab: Abnormal fish histology, special staining techniques
- Week 8: Fish Reproductive System
Assignments: Readings from 2 and 3.
Lab: Processing and embedding bivalve tissue, special staining techniques
- Week 9: Mollusks Anatomy and Physiology
Assignments; Readings from 4 and 5.
Lab: Microscopic examination of normal and abnormal bivalve tissues, sectioning
- Week 10: Mollusks Abnormal Anatomy and Physiology
Assignments: Readings from 4 and 5.
Lab: Microscopic examination of normal and abnormal bivalve tissues, staining and mounting
- Week 11: Crustacean Anatomy and Physiology
Assignments: Readings from 5 and 6.
Lab: Processing and embedding shrimp tissue, microscopic examination of normal and abnormal shrimp tissue
- Week 12: Crustacean Abnormal Anatomy and Physiology
Assignments: Readings from 5 and 6.
Lab: Microscopic examination of normal and abnormal shrimp tissues, sectioning, histochemical stains
- Week 13: Histochemistry
Assignments: Readings from 1.
Lab: Histochemical stains, in situ techniques
- Week 14: Insitu Fluorescent Technology
Assignments: TBD.
Lab: In situ techniques, using the fluorescent microscope
- Week 15: Oral Presentations
- Week 16: Portfolios due; Final Exam