FNR 455: FISH ECOLOGY (Spring 2014)

Instructor: Dr. Tomas Hook (thook@purdue.edu; 765-496-6799)
Office hours: TBA and by appt.
TA: Allison Hrycik (ahrycik@purdue.edu)
Office hours: Wed. 10-12 FORS 206

COURSE DESCRIPTION AND OBJECTIVES (official; from Purdue website):

The relationship of fishes to the physical, chemical, and biological features of their environment in both natural and perturbed aquatic ecosystems. An emphasis will be placed on diversity in morphology, behavior, feeding, and reproductive strategies as they relate to individual and population adaptation, community structure, and anthropogenic effects. (Prerequisites: BIOL 286 or equivalent, and FNR 241 and 242.)

1. Develop an appreciation for the diversity of responses by individual fish to environmental variability and the consequences of individual adaptation for population and community persistence in freshwater and marine ecosystems
2. Identify the relationship of fishes in freshwater and marine ecosystems to the physical, chemical, and biological features of their environment in both perturbed and unperturbed aquatic environments
3. Develop an understanding of fish diversity in terms of morphology, behavior, feeding, and reproductive strategies and habitat selection as they relate to individual and population adaptation, and community structure in both freshwater and marine environments
4. Understand the elementary principles of fish population dynamics and response strategies to biotic and abiotic features of the environment
5. Identify the limits of ecological adaptation in the development of alternative fisheries management strategies
6. Develop critical thinking, written and oral communication, and professional skills as they relate to ecological theory within the context of fisheries biology and management.

COURSE STRUCTURE:

The course will progress through three separate themes focusing on different levels of ecological organization: [1] Individual growth and foraging, [2] Population regulation, and [3] Fish communities and conservation. The course consists of two lecture meetings per week (1 hr & 15 min each). The lecture periods are intended to present material and discuss concepts (material and concepts will be supported by readings from the textbook and selected material from the primary literature).

TEXT BOOK:

Diana, J.S. 2004. Biology and Ecology of Fishes (Second Edition). Biological Sciences Press.

PARTICIPATION & ASSIGNMENTS EXPECTATIONS:

The course grade will be based on reading and considering articles from the primary literature, developing and presenting a research proposal, three in-class exams and a final exam:

Activity	Points
Research proposal	20
Journal article homework	20
Exams 1-3	40
Final Exam	20

Total 100

Grade	Range
A+	>97
A	93.0 - 96.9
A-	90.0 - 92.9
B+	87.0 - 89.9
B	83.0 - 86.9
B-	80.0 - 82.9
C+	77.0 - 79.9
C	73.0 – 76.9
C-	70.0 – 72.9
D+	67.0 – 69.9
D	63.0 – 66.9
D-	60.0 – 62.9
F	< 60.0

[1] *JOURNAL ARTICLES*: A number of readings from research articles will be assigned to complement material covered in lectures. All students are expected to read all journal articles and be familiar with content therein. In addition, after reading journal articles students will turn in answers for questions specific to each article. Articles and questions will be provided on the Blackboard site.

[2] *RESEARCH PROPOSAL & PRESENTATION*: Through the course of the semester, students will develop a research proposal on a topic of their choice related to applied fish ecology. Students will be asked to submit a research preproposal which will be reviewed by instructors and other students. In addition, students will present a 7-minute proposal presentation to allow other students to share their research ideas with their classmates in order to receive constructive feedback that will enhance their proposed projects. Finally, students will turn in a single-spaced 10 page description of the proposed project including budget. Students must use the primary literature (journal articles) to support their research hypotheses and experimental design.

[3] *EXAMS 1-3*: Closed-book exams will test your knowledge of basic facts and your understanding and synthesis of class concepts. The journal articles and textbook readings reinforce the lecture material and will be used to develop exam questions. Exam questions will include true/false, multiple choice, definitions, quantitative questions, short answer, and essays.

[4] *FINAL EXAM*: The closed-book final exam will be similar to exams 1-3 and will be cumulative.

RE-GRADES:

If you perceive an error in grading, you can request a re-grade for specific exam/assignment questions. All re-grade requests must be accompanied by a well-reasoned, written argument as to why the answer is correct and deserves more points. The re-grade request is due within 1 week of the assignment/exam being returned to students.

CLASSROOM ATTENDANCE & BEHAVIOR:

I believe that it is useful for you to attend class, ask questions and engage in classroom discussions. If you choose not to attend class on any day, then you accept the responsibility to learn the material on your own. If you have a question during the class period, please do not hesitate to ask. In fact, other students probably have the same question. It is important to be on time for class since the first 5 minutes of each lecture will establish the direction for that day's session. Therefore, if you come in late, certain

things may not make sense and you may miss important announcements. Throughout the semester, please be courteous to all of your fellow students and instructors so we can create a positive learning environment. All cellphones should be turned off before entering the classroom and should not be used during class.

FEEDBACK & ADAPTATION:

This course is for you to learn important fundamental concepts and ideas on which to build your understanding of ecology and natural resource management. I will do my best to create a positive learning environment. However, learning styles differ among students, so I may do some things that are not optimal for you. If this occurs, you can let me know through email or written comments turned in at the end of the class period or during office hours. Because I need to keep the interest of all students in mind, I cannot promise that I will change the course. However, I do promise to listen and consider your suggestions. Moreover, course evaluations will be completed by students at the middle and end of the semester so that course changes can be made to enhance the learning experience for this class and future classes.

ACADEMIC HONESTY:

I have a zero-tolerance policy for cheating. However, if you are not sure which activities constitute cheating, please ask me. Cheating is not fair to yourself or other students. Examples of cheating include, but are not limited to the following activities: attempting to pass others' work as your own (i.e., plagiarism), using crib sheets, or providing exam answers to other students. Students who cheat will receive a zero on the assignment in question and will most likely fail the course.

ACCOMMODATIONS FOR DISABILITIES:

If you have a disability and/or a special need that requires accommodations, please inform me during the first two days of the course so that we can develop a plan to work with you and if necessary arrange an appointment with a campus disabilities counselor.

SCHEDULE:

		READINGS
WEEK 1	*14-Jan: Introductions* *16-Jan: Balanced energy equation, metabolism*	Diana 1
WEEK 2	GROWTH *21-Jan: Lecture* *23-Jan: Lecture*	Diana 2-6
WEEK 3	GROWTH and NICHE CONCEPTS *28-Jan: Lecture* *30-Jan: Lecture*	Diana 7-9
WEEK 4	DENSITY DEPENDENCE and COMPETITION *4-Feb: Lecture* *6-Feb: Lecture*	Diana 10
11-FEB EXAM I		
WEEK 5	FORAGING *13-Feb: Lecture*	Diana 11-13
WEEK 6	PREDATOR-PREY and TROPHIC INTERACTIONS *18-Feb: Lecture* *20-Feb: Lecture*	

WEEK 7	REPRODUCTION and EARLY LIFE HISTORY PATTERNS *25-Feb: Lecture* *27-Feb: Lecture*	Diana 16+18
WEEK 8	LIFE HISTORY TRAITS and SOCIAL BEHAVIOR *4-Mar: Lecture* *6-Mar: Lecture*	Diana 14+17
11-March EXAM II		
WEEK 9	**PROPOSAL DISCUSSIONS** ***13-March: Discussions***	
NO CLASS SPRING BREAK		
WEEK 10	DISTRIBUTIONS, GUILDS, HABITAT UTILIZATION and COMMUNITY STRUCTURE *25-March: Lecture* *27-March: Lecture*	Diana 14-15, 19
WEEK 11	FISH COMMUNITIES IN FRESHWATER and MARINE SYSTEMS *1-April: Lecture* *3-April: Lecture*	Diana 20-23
WEEK 12	FISH COMMUNITIES in the GREAT LAKES *8-April: Lecture*	Diana 25
10-April EXAM III		
WEEK 13	**PROPOSAL PRESENTATIONS** ***15-April: Presentations*** ***17-April: Presentations***	
WEEK 14	ECOSYSTEM PERTURBATIONS *22-April: Lecture* *24-April: Lecture*	
WEEK 15	FISHING, MANAGEMENT, CONSERVATION *29-April: Lecture* *1-May: Lecture*	Diana 24+26