The Diversity of Fishes
BIOL 480/EVPP 536

Instructor: **Dr. Kim de Mutsert**
Assistant Professor, Environmental Science and Policy

Course Description and Goals: This course is an overview of the biology, evolution and ecology of fishes. During the course students will examine the taxonomy, anatomy, physiology, zoogeography, ontogeny, reproduction, ecology, and conservation of fishes. Students will learn concepts in ichthyology and fish ecology. After completion of the course, students should have knowledge of the phylogeny and evolution of fishes, and understand their behavior, community dynamics and ecosystem interactions. In addition, students should understand that anthropogenic factors affect fishes and their environment. Through this course, students will also strengthen their presentation and discussion skills, and their ability to interpret scientific literature and think critically.

Course Content and Instructional Methods: The course consists of lectures and student presentations. Below is a list of lecture topics by week. The list below also indicates which chapters should be read from the textbook. Any additional readings will be posted to blackboard. Lectures will consist of powerpoint presentations that will be posted to our course on the day of the lecture. All students will give a 12-minute presentation as part of the 'Coolest Fish Competition' about a fish species of their choosing that has caught their interest from an evolutionary, anatomical, life-history, or behavioral perspective. Knowledge of the course material will be tested during two mid terms and one final exam. There will be two student presentations at each of the following dates:

Week and date	Student presenter 1	Student presenter 2
6. Feb 23		
7. March 1		
10. March 22		
12. April 5		
13. April 12		
14. April 19		
15. April 26		

This schedule will be placed and updated on Blackboard; send your preferred date and subject (species) to your instructor.

EVPP 536 students only: The last day of class EVPP 536 students will turn in an original 8-page single-spaced paper; this paper should be an elaborate species description. Students should use multiple sources (books or publications in scientific journals) for this paper.

Grading:

	Points distribution	
Course:	**BIOL 480**	**EVPP 536**
Exam 1	25	20
Exam 2	25	20
Presentation	15	15
Participation	5	5
Paper		15

Final exam	30	25
Total	**100**	**100**

Your final grade will be a letter grade, while your grades in class will be scores. Your grade will be translated to a letter grade at the end of the semester as follows:

Score	**Letter grade**
70-72	C -
73-76	C
77-79	C+
80-82	B-
83-86	B
87-89	B+
90-92	A-
93-96	A
97-100	A+

Facultative Summer Lab:
A separate lab will be offered every other summer that compliments this course (EVPP/BIOL 582). The lab is a facultative part of the course (it is a separate 1-credit course), but highly recommended. During the lab students will receive hands-on experience in the field on the topics discussed in class at different field sites in the Potomac River, the Chesapeake Bay and the Atlantic coast. In three fieldtrips, fish will be sampled from freshwater tidal, estuarine, and marine environments. Students will develop a project in small groups related to ichthyology or ecology based on field collections, lab work, and/or the PEREC fish collection. Each group will present their project in class and write a research paper on this subject. There is no exam at the end of the summer lab.

Honor Code: Adherence to the *GMU Honor Code* is expected of all students, specifically:

> *Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.*

In all assignments and communications, plagiarism will not be tolerated. This applies equally to oral and written communications in the context of any evaluated (graded) course assignments. In presenting quotes, paraphrasing statements or logical arguments from others in any medium (on-line, oral or written), students should properly cite their source. Any public usage of original material from this course (e.g., presentations, images, etc.) without explicit permission of its creator shall be construed as stealing. As stated in the Honor Code, infractions may result in invalidated credit for dishonorable work and lowered grade, including failure from the class, suspension or dismissal. Inquiries for clarification from the professor are welcome. Thank you in advance for your conscious attention to these issues.

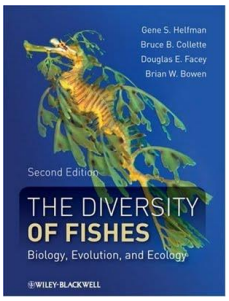
Absenteeism Policy: Please inform your instructor in advance if you will be absent from class due to sickness or other reasons.

Lecture Topics Schedule

Week. Date	Topic	Readings
<u>PART I. What is a fish: Anatomy, Taxonomy, Phylogeny and Systematics</u>		
1. Jan 19	Intro to Class and Anatomy	Chapter 1, 3, 4
2. Jan 26	Taxonomy and Phylogeny: Background and history	Chapter 2, 11
3. Feb 2	Taxonomy and Phylogeny: Primitive Fishes and Chondrichthyes	Chapter 12 and 13
4. Feb 9	Taxonomy and Phylogeny: Teleosts	Chapter 14 and 15
5. Feb 16	**Exam 1:** PART I (Everything offered from week 1 to 4) + visit to fish collection	
<u>PART II. How do fishes function: Physiology, Reproduction, Adaptations, and Zoogeography</u>		
6. Feb 23	Physiology	Chapters 5, 6 and 7
7. March 1	Ontogeny and Reproduction	Chapter 9, 10 and 21
8. March 8	Spring Recess	
9. March 15	Guest Speaker: TBA + movie	Bb
10. March 22	Zoogeography and Habitat Adaptations	Chapter 16, 18 and 23
11. March 29	**Exam 2:** PART II (Everything offered from week 6 to 10)	
<u>PART III. How do fishes interact with their environment: Community Dynamics, Ecology, and Human Impact</u>		
12. April 5	Population and Community Dynamics (+ intro to Analysis)	Chapter 22, 24, 25
13. April 12	Foodweb Interactions	Chapter 19, 20, 25
14. April 19	Fisheries (+ intro to Ecosystem Modeling)	Bb
15. April 26	Human Impact and Conservation; **EVPP 536 Papers Due;** CFC winner chosen	Chapter 26, Bb

Cumulative Final Exam (Study everything offered in this class): Date: **May 10** Time: **4:30-6:30 PM**

Readings:
Helfman, G. S., B. B. Collette, D. E. Facey, and B. W. Bowen (eds.). 2009. The Diversity of Fishes, second edition: Biology, Evolution, and Ecology. Wiley-Blackwell, Oxford, UK. 736 pp.



All other readings will be posted on blackboard (Bb).