ENR 5350.02
Taxonomy and Behavior of Fishes

Syllabus and Class Schedule
Autumn 2015

Wednesday or Thursday: 5:00-7:45 pm
Heffner Wetland Research Building

DRAFT SYLLABUS 08/17/15

INSTRUCTOR:
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*when emailing, please include “ENR5350.02” in the subject line
*office hours are by appointment

COURSE DESCRIPTION:

The objective of this course is to introduce students to the great diversity of fishes, especially the fishes of Ohio. Freshwater fish comprise more than 30% of all vertebrate species, yet available freshwaters make up only 1% of Earth’s habitats. In this course we will explore this incredible diversity through the study of fish taxonomy and behavior,
with an emphasis on understanding the evolutionary relationships between taxa and the ways that fish have adapted to a wide range of environmental conditions, including environmental variation caused by human activity.

**COURSE OBJECTIVES:**

1. Learn to identify the major groups of fishes and their evolutionary relationships.
2. Learn the basic biology of fishes, including morphology and anatomy, behavior, form and function.
3. Learn to identify the major groups of Ohio fishes and to identify common fishes to species-level.
4. Identify morphological and behavioral adaptations to diverse environments.
5. Learn basic fish collection and preservation skills.
6. Investigate the effects of human activities on the diversity of fishes.

**COURSE STRUCTURE:**

We will meet once per week for a combined three hour lecture and lab session at the Hefner Wetland Research Building. The format will vary from week to week depending on planned fields or lab activities.

- Wednesdays (section 0010/1010) 5:00 pm to 7:45 pm
- Thursdays (section 0020/1020) 5:00 pm to 7:45pm

**LABORATORY AND FIELD ACTIVITIES:**

Labs will be used to gain hands-on experience collecting, identifying and observing fishes, with an emphasis on Ohio fishes. While identification skills are being learned, students will also be asked to critically evaluate the morphological features we use to ID the fish, identify similarities/differences between distantly and closely related groups, and consider the linkages between these traits and the environments where the fish are found.

*Field Sampling:* Some labs will be devoted to collecting, preserving, and identifying fishes found in local streams, rivers and ponds. The goal of field sampling will be to familiarize students with fish collection and handling methods, preservation techniques, and identifying live specimens to Family. Appropriate clothing should be worn for field labs. Waders are available for use at the Wetlands Centre or you can bring your own.

*Lab work:* Other labs will be devoted to learning the basic morphology of fishes through dissection, how to identify fish to species, and how to quantify fish behaviors. When in
the lab students should wear closed-toed shoes and long pants. Dissection materials will be provided but you can also bring your own dissection kit.

**COURSE MATERIAL AND RESOURCES**

There is **no required text** for this course; however, I **highly recommend** that you consider purchasing the following text:


*Note: Limited copies will be available in lab for ID purposes and on reserve at the CFAES library.*

**Other Recommended Books**


**Web Resources:**

The class website on CARMEN will be used to make announcements, promote peer-peer discussions, post additional readings, etc. Please check it often.

Other potentially useful on-line tools:


NOTE: There will be supplemental readings assigned for discussion in some classes. These readings will be posted on Carmen. Readings are meant to augment material covered in lecture and solidify your understanding of the general concepts presented; therefore, these readings are required.

**STUDENT EVALUATION**

- Quizzes (5 total, 8% each) = 40%
- Field Collection and Report = 25%
- Project Presentations and Report = 25%
- Attendance and Participation = 10%

**GRADING SCHEME**

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**Important Dates (W/Th)**

- September 9/10  Quiz #1
- September 23/24 Quiz #2
- October 7/8     Quiz #3
- October 21/22   Field Collection and Report due
- October 26      Last day to have Behavior Projects approved
- October 28/29   Quiz #4
- November 18/19  Quiz #5
- December 2/3    Behavior Presentations – last day of class
- December 12     Behavior Paper Due
Quizzes (40%): There will be five in-class quizzes worth 8% each. There will be NO final examination. Quizzes will cover material presented in lecture (e.g. theory) and lab (e.g. fish identification), videos, and assigned readings (i.e. the answer to the question, “Will this be on the quiz?” is “YES”). Quizzes are not cumulative, but having a good grasp of the major themes presented throughout the semester (e.g. reproductive behavior, habitat preference, etc.) will help you to do well on the quizzes. All quizzes are mandatory. Make-up quizzes will only be administered for those students with documented excuses (e.g. health or family emergency).

Field Collection and Report (25%): Learning how to collect, preserve, and identify fishes is an essential skill-set for many careers in aquatic and environmental sciences. During several lab sessions we will collect fish from waterbodies around Columbus using a variety of methods, with the goal of creating a class fish collection. A sub-sample of all fish species collected (with the exception of rare or endangered species which must be returned to the wild) will be preserved and made available for students to identify outside of class time. Students will work in pairs to identify each specimen and create a report describing the fish communities at each site (see “Field Collection and Report Instructions” on Carmen). Students may ask the TAs to verify their identifications; TAs will only provide “correct” or “incorrect” verification.

Graduate Student Supplement: In addition to independently identifying the species collected during sampling, graduate students will be required to identify a series of preserved specimens collected by the Ohio EPA and incorporate this information in their report.

Project Presentation and Scientific Paper (25%): A major objective of this course is for students to learn about the behavior of fishes. Behaviors are typically easy to observe and are often the first response of an animal to external stimuli. Thus observing and quantifying fish behavior helps to increase our understanding of how fishes interact with their social and ecological environment. Working in groups of four (graduate students must work individually) students will choose one of five potential behavioral studies using live fish. Time outside of class will be made available for students to observe the live fish prepared for these projects. Students must generate their own hypothesis, predictions and observational design within the framework of their chosen project (see “Project Presentation and Paper Guidelines” on Carmen). The observational design must be approved by your TA no later than October 26th by 5:00pm.

Graduate student supplement: Working independently, graduate students have the option of choosing one of the planned behavioral projects or alternatively developing a project of their own based on other media (e.g. videos, manipulative
computer programs, etc.). Their project **must be approved by the Instructor no later than October 26th by 5:00pm.**

*Late Assignment Policy*: Reports and papers are due by the times stated in the Instructions. For every day that an assignment is late, 10% will be deducted from the final assignment grade.

**Attendance & Participation (10%)**: Attendance for all components of this course is mandatory - missing class will result in a lower participation mark. Unavoidable absences require prior permission of the instructor (email or phone call). Marks for participation will come from a variety of in-class assignments, discussions, and lab-based activities. A small portion of the Participation mark (3 out of the 10%) will be determined by peer-evaluation of project group members at the end of the semester. Participation in on-line discussions on Carmen (e.g. posting about new fish-related discoveries from the media or scientific papers of interest) will be monitored and considered for additional participation points.
**Draft Schedule of Lectures and Labs**

*Note: this schedule is subject to change as the course progresses*

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<tr>
<th>Week</th>
<th>Date (Wed/Thurs)</th>
<th>Topics</th>
<th>Activities and/or Readings</th>
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| 1    | 08/26 08/27      | Course overview  
Introduction to the origins of fishes  
Morphology, anatomy, use of keys | Dissections  
Key to families |
| 2    | 09/02 09/03      | Terminology, taxonomy, phylogeny  
Field collection and preservation methods | Field Collection – ORWRP |
| 3    | 09/09 09/10      | Jaws, fins and bones  
Agnatha vs. Gnathostomata | Quiz #1  
Petromyzontiformes, Acipenseriformes, Lepisosteiformes, Amiiformes, Clupeiformes |
| 4    | 09/16 09/17      | Field trip | Field Collection – Licking River |
| 5    | 09/23 09/24      | Diversity, form and function  
Teleostei | Quiz #2  
Cypriniformes |
| 6    | 09/30 10/01      | Field trip | Field Collection – Darby Creek |
| 7    | 10/07 10/08      | The weird and the wonderful | Quiz #3  
Siluriformes, Esociformes, Salmoniformes, Perciformes, etc. |
| 8    | 10/14            | **Wednesday: Open lab for identification (both sections)** | |
|      | 10/15            | **Thursday: Autumn Break – NO CLASS** | |
| 9    | 10/21 10/22      | Fish behavior | Reading:  
TBD Quantifying behavior |
| 10   | 10/28 10/29      | Reproductive behavior and diversity | Quiz #4 |
| 11   | 11/04 11/05      | Human impacts on fishes | Reading:  
TBD Fishing impacts |
| 12   | 11/11            | **Wednesday: Veteran’s Day – NO CLASS** | |
|      | 11/12            | **Thursday: Open lab for project analysis (both sections)** | |
| 13   | 11/18 11/19      | Note: Meet at 6:00pm for both sections  
Open lab for project analysis, presentation preparation | Quiz #5 (start 6:00)  
**Thursday: SENR Seminar Speaker 4:10-5:30 Dr. Lauren Chapman (bonus pts)** |
| 14   | 11/25 11/26      | **Thanksgiving – NO CLASS** | |
| 15   | 12/02 12/03      | **Presentations** | |
| 16   | 12/09 12/10      | **NO CLASS** | |
**Academic Misconduct**

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University’s Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University’s Code of Student Conduct and this syllabus may constitute “Academic Misconduct.”

The Ohio State University’s Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: “Any activity that tends to compromise the academic integrity of the University, or subvert the educational process.” Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University’s Code of Student Conduct is never considered an “excuse” for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University’s Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

**Disability**

Students with disabilities that have been certified by the Office for Disabilities Services (http://www.ods.ohiostate.edu/default.asp) will be appropriately accommodated, and should inform the instructor as soon as possible of their needs.