

Taxonomy and Behavior of Fishes Syllabus

ENR 5350.02, Stone Lab, Summer 2023

Course Information

- **Course times and location:** Monday, Wednesday, Friday, 8:00am-4:00pm, however, by nature of this course being held at an island field school, this schedule will be flexible. For example, on field trip days, we will leave promptly at 7:30am and return by 5:00 pm.
- **Credit hours:** 3.0 credit hours
- **Mode of delivery:** In-person

Instructor

- **Name:** Dr. Zachary Steffensmeier
- **Email:** Steffensmeier.7@osu.edu
- **Phone Number:** 614-517-4568
- **Office location:** Stone Lab (room 206)
- **Office hours:** By appointment
- **Preferred means of communication:**
 - My preferred method of communication for questions is **email**.
 - My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to be sure you receive these messages.

Course Description

Freshwater fish comprise more than 30% of all vertebrate species, yet available freshwaters make up less than 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 Goals

1. Explore the diversity of fishes, with emphasis on the freshwater fishes of Ohio.
2. Explore fish behavior, especially as it pertains to the ways that fish respond to and interact with their social and ecological environment.
3. Promote critical thinking about how human-induced environmental change influences fish populations.

Learning Outcomes

By the end of this course, students should successfully be able to:

- identify the major groups of fishes and their evolutionary relationships.
- describe the basic biology of fishes, including morphology and anatomy, behavior, form and function.
- identify the major groups of Ohio fishes and to identify common fishes to species-level.
- identify morphological and behavioral adaptations to diverse environments.
- demonstrate basic fish collection and preservation skills.
- discuss the effects of human activities on the diversity of fishes.



How This Course Works

Course Structure: This course will combine classroom lectures, discussions, labs, and field trips, and by nature of being held at an island field school, the schedule will be flexible.

Meeting times: Monday, Wednesday, Friday 8:00am-5pm

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 Lake Erie, 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. Appropriate clothing should be worn for field labs (you may get wet and dirty) – shorts, bathing suits, water shoes, etc. Waders are available for use, or you can bring your own; however, in some cases just bringing a change of clothes may be preferable to wearing waders.

Lab work: Regular labs will be devoted to learning the basic morphology of fishes through dissection, how to identify preserved fish to species, and how to quantify and analyze fish behaviors. Basic dissection materials and equipment will be provided but you can also bring your own dissection kit if you wish. We will additionally be setting up behavioral experiments in the lab (possibly in the lake, dependent on water quality conditions). Students may opt to snorkel to perform experiments – equipment is available, but you can bring your own if you prefer.

Credit hours and work expectations: This is a 3 credit-hour course. According to [Ohio State bylaws on instruction](http://go.osu.edu/credit%20hours) (go.osu.edu/credit hours), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of C average.

Attendance and participation requirements: Research shows that regular participation is one of the highest predictors of success. With that in mind, I have the following expectations for everyone's participation:

- Attendance for all components of this course is mandatory – missing class or lab will result in a lower participation grade.
- Unavoidable absences require prior permission of the instructor (email or phone call), or in emergency situations communicate with me when you are able (I understand that life happens).



Course Materials, Fees and Technologies

Required Materials and/or Technologies

1. **Laboratory Manual:** We have compiled a Laboratory Manual that is available in electronic format on the class Carmen page (combined in one PDF and by lab in separate modules). You are required to access and read the section for each lab BEFORE arriving to the field site or to the lab. Note that I will periodically be updating the lab manual but will make sure to announce any changes to the class.
2. **Text:** None – see below.
3. **Supplemental Readings:** 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.
4. **Web Resources:** The class website on CARMEN will be used to make announcements, promote peer-peer discussions, post additional readings and resources, etc. Please check it often. A class website, <https://u.osu.edu/enrfishtax/>, will be used for posting #scicomm extra credit assignments. Students must sign in to u.osu.edu and then be added to the class site in order to post their #scicomm assignments.
5. **Field Notebook:** Each student will need a notebook to take notes during field labs. Any notebook will do, though many prefer a waterproof notebook (e.g., Rite in the Rain field books – many options).

Recommended/Optional Materials and/or Technologies

- **Highly recommend** that you consider purchasing the following texts:

Rice and Zimmerman. 2019. A naturalist's guide to the fishes of Ohio. Ohio Biological Survey.

Trautman, M.B. 1981. The Fishes of Ohio (revised Ed.). Ohio State University Press, Columbus. Pp. 782

Note: *Limited copies of both texts will be available for check out for ID purposes from the Stone Lab library.*

- **Other Recommended Books**

Hubbs, C.L. and Lagler, K.F. (revised by Smith G.R.). 2004. Fishes of the Great Lakes Region. The University of Michigan Press, Ann Arbor. Pp 276.

Moyle, P.B. and Cech, J.J. 2004. Fishes: An Introduction to Ichthyology (5th Ed.). Prentice Hall, Upper Saddle River, NJ. Pp. 726.

Holm, E., Mandrak, N.E., and Burrige, M. 2008. The ROM Field Guide to Freshwater Fishes of Ontario. Royal Ontario Museum, Toronto, Ontario. Pp. 432.

Magnhagen, C., Braithwaite, V.A., and Forsgren, E. 2008. Fish Behaviour. CRC Press. Pp. 662.

- **Other potentially useful on-line tools:**

<http://www.fishbase.org/search.php>

<http://currents.plos.org/treeoflife/article/the-tree-of-life-and-a-new-classification-of-bony-fishes/>

<http://research.calacademy.org/redirect?url=http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>

http://swordtail.tamu.edu/anyfish/Main_Page

http://evolution.berkeley.edu/evolibrary/article/fishtree_01

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection
- **Webcam:** built-in or external webcam, fully installed and tested
- **Microphone:** built-in laptop or tablet mic or external microphone
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for technology and internet access at go.osu.edu/student-tech-access.

Required Software

Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Visit the [installing Office 365](http://go.osu.edu/office365help) (go.osu.edu/office365help) help article for full instructions.



CarmenCanvas Access

You will need to use [BuckeyePass](https://buckeyepass.osu.edu) (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you can connect to Carmen at all times, it is recommended that you do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](https://go.osu.edu/add-device) (go.osu.edu/add-device) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- [Install the Duo Mobile application](https://go.osu.edu/install-duo) (go.osu.edu/install-duo) on all your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at [614-688-4357 \(HELP\)](tel:614-688-4357) and IT support staff will work out a solution with you.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- [Navigating CarmenCanvas](https://go.osu.edu/canvasstudent) (go.osu.edu/canvasstudent)
- [CarmenZoom virtual meetings](https://go.osu.edu/zoom-meetings) (go.osu.edu/zoom-meetings)
- [Recording a slide presentation with audio narration and recording, editing and uploading video](https://go.osu.edu/video-assignment-guide) (go.osu.edu/video-assignment-guide)

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions, or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Self Service and Chat:** go.osu.edu/it
- **Phone:** [614-688-4357 \(HELP\)](tel:614-688-4357)
- **Email:** servicedesk@osu.edu



Grading and Faculty Response

How Your Grade is Calculated

Assignment Category	Percentage
Lab Quizzes (4 total, 5% each)	20
Lecture Midterms (2 total, 5% each)	10
Field Notes and Fish ID Collection	20
Behavioral Observations Presentation	15
Attendance and Participation	15
Final Exam and Lab Practical	20
#Scicomm (Extra Credit, optional)	3
TOTAL	100

See [Course Schedule](#) for due dates.

Descriptions of Major Course Assignments

Lab Quizzes (20%)

Description: There will be **four** in-lab quizzes worth 5% each. Lab Quizzes are aimed at helping you master your identification skills, including morphology and anatomy of fishes, learned in the field and lab (e.g., fish identification) and as such are practical in nature. Quizzes are not cumulative (i.e., you will not be tested on material from the previous 1-3 labs). All quizzes are mandatory and make-up quizzes will only be administered for those students with documented excuses (e.g., health or family emergency).

Midterms (10%)

Description: There will be two midterms worth 5% each. Midterms will cover material presented in lecture (e.g., theory), videos, and assigned readings. (i.e., the answer to the question, "Will this be on the Quiz?" is "YES"). Midterms 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 midterms. Both Lecture Midterms are

mandatory and make-up exams will only be administered for those students with documented excuses (e.g., health or family emergency).

Field Notes and Fish ID Collection (20%)

Description:

Field Notes:

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 Lake Erie and surrounding waterbodies using a variety of methods, with the goal of learning to catch and ID fish in the field and humanely preserve voucher samples. Each student is responsible for keeping a set of field notes for each site we visit. At the end of the semester, students will compile their notes in a report form that describes the sites and the fish communities sampled (see “Field Notes Instructions” on Carmen for details).

Fish ID Collection:

The goal of this assignment is for students to develop expertise in identifying preserved fish specimens. For each of the field sites that the class will visit, I will create ~3-5 jars each containing several representative species from the site. Each jar will be assigned a point value depending on the number of fish/species it contains. Students will work **outside of class/lab time** to identify each specimen in a number of jars (see “Fish ID Collection Instructions” on Carmen). The number of jars a student examines is up to the student; however, a grade of ‘A’ can only be attained if all jars are examined, and the identifications are correct. I will help guide you through the identification keys but will NOT verify your identifications. An Excel template for recording your identifications will be provided on Carmen.

Behavioral Observations Presentation (15%):

Description: 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. For this assignment students will work together in groups (graduate students must work individually, see below) to develop a hypothesis-driven observation project and set-up the experiment in the lab or field, as appropriate. Time during labs will be made available for students to make observations, collect, and analyze their data. In small groups, students will generate a hypothesis, predictions, and observational design, analyze their results, and present their findings in a presentation on the last Thursday of the class. The hypothesis and observational design **must be approved no later than Thursday, July 14th**.

Graduate student supplement: Working independently, graduate students have the option of a behavioral project using the live fish set-up provided or alternatively developing a project of their own based on other media (e.g., videos, manipulative computer programs, etc.). Their project **must still be approved by Thursday, July 14th**.

Attendance & Participation (15%)

Description: This five-week course is comprised of an intense schedule of lecture, lab, and field activities and requires full participation of all students. Attendance is mandatory for all components of this course (including the Thursday evening lecture series) - missing class or lab will result in a lower participation grade. Unavoidable absences require prior permission of the instructor. Participation will come from a variety of assignments, discussions, and lab-based activities.

Final Exam and Lab Practical (20%)

Description: The Final Exam and Lab Practical will be a cumulative, oral examination. Section A will involve identifying fish you have observed during the course; Section B will cover lecture material and will be designed to test your knowledge of fish taxonomy and behavior.

#Scicomm Assignment (Extra Credit = 3% max)

Description: Scientific communication, providing outreach and engagement with the public, is essential to the conservation of fish biodiversity. Increasingly, scientific communication (#scicomm) is facilitated through social media outlets such as Twitter, Facebook, Instagram, TikTok, personal or lab blogs, etc. The goal of this optional assignment is for students to use multimedia formats to present a fish story that is accessible to the public and relevant for the people of Ohio. These can take the form of written blogs, sound clips, videos, animations, etc. to be posted on the class website (<https://u.osu.edu/enrfishtax/>). Students are encouraged to post on multiple topics and to direct the public to their posts via social media. Posts will be assessed for accuracy of content and accessibility to diverse audience and deemed satisfactory or not, with an opportunity for revising the post if deemed unsatisfactory. Each satisfactory post, to a maximum of 3 posts, will be worth 1% on the final grade (Details on "#scicomm Instructions" sheet on Carmen).

Written Assignments:

Format and Submission: All written assignments are to be submitted electronically using Carmen Dropbox by 11:59 pm on the date that they are due unless stated otherwise. Written assignments should have 1" margins, 12 pt Times New Roman font, double line spacing, and all pages should be consecutively numbered, including the cover page. All written assignments should include a cover page that provides your name, name.#, title of the assignment, and the date. In-text citations and reference lists should follow the instructions found in the Author Guidelines for the Journal of Fish Biology ([http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1095-8649/homepage/ForAuthors.html](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1095-8649/homepage/ForAuthors.html)). A single file saved as a Word document with your name and assignment title as the file name (e.g. "GRAY_Annotated Bibliography") should be submitted.

Late Assignments

Please refer to Carmen for due dates. Due dates are set to help you stay on pace and to allow timely feedback that will help you complete subsequent assignments. Reports and papers are due by the time stated in the instructions. Late assignments will not be accepted without prior permission. If you have an emergency or life situation that impacts your ability to turn in an

assignment on time, please reach out directly as soon as possible so we can discuss alternate arrangements.

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call [614-688-4357 \(HELP\)](tel:614-688-4357) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **24 hours during normal business hours**.
- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check [your notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Discussion board:** I will check and reply to messages in the discussion boards once mid-week and once at the end of the week.
- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **seven days**. Assignments submitted after the due date (with permission) may have reduced feedback, and grades may take longer to be posted.

Grading Scale

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70–72.9: C-
67–69.9: D+
60–66.9: D
Below 60: E



Other Course Policies

Discussion and Communication Guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:**
 - **Emails:** Please write in a professional manner (i.e., use appropriate salutation and write in full sentences).
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. I will provide specific guidance for discussions on controversial or personal topics.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.

Academic Integrity Policy

See [Descriptions of Major Course Assignments](#) for specific guidelines about collaboration and academic integrity in the context of this online class.

Ohio State's Academic Integrity Policy

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](#) (studentconduct.osu.edu), 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. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- [Committee on Academic Misconduct](http://go.osu.edu/coam) (go.osu.edu/coam)
- [Ten Suggestions for Preserving Academic Integrity](http://go.osu.edu/ten-suggestions) (go.osu.edu/ten-suggestions)
- [Eight Cardinal Rules of Academic Integrity](http://go.osu.edu/cardinal-rules) (go.osu.edu/cardinal-rules)

Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Creating an Environment Free from Harassment, Discrimination, and Sexual Misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, [on-demand mental health resources](https://go.osu.edu/ccsondemand) (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at [614- 292-5766](tel:614-292-5766). **24-hour emergency help** is available through the [National Suicide Prevention Lifeline website](https://www.nationalsuicideline.org/) (suicidepreventionlifeline.org) or by calling [1-800-273-8255\(TALK\)](tel:1-800-273-8255). [The Ohio State Wellness app](https://go.osu.edu/wellnessapp) (go.osu.edu/wellnessapp) is also a great resource.

Accessibility Accommodations for Students with Disabilities

Requesting Accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with [Student Life Disability Services \(SLDS\)](#). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services.

Disability Services Contact Information

- Phone: [614-292-3307](tel:614-292-3307)
- Website: slds.osu.edu
- Email: slds@osu.edu
- In person: [Baker Hall 098, 113 W. 12th Avenue](#)

Accessibility of Course Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations as early as possible.

- [CarmenCanvas accessibility](http://go.osu.edu/canvas-accessibility) (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- [CarmenZoom accessibility](http://go.osu.edu/zoom-accessibility) (go.osu.edu/zoom-accessibility)

Course Schedule

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

Day	Time	Description	Readings & Assignments
Monday 07/03	4:00-5:00p 5:00-6:00p 6:30-7:00p	Stone Lab Orientation <i>Dinner</i> Course Overview	
WEEK ONE: Introduction, Diversity, Identification			
Wednesday 07/05	7:00-8:00a 8:00a-12:00p 12:00-1:00p 1:00p-4:00p 5:00p-6:00p	<i>Breakfast</i> Lectures 1-2 (1. Intro to the origins of fishes, 2. Terminology, taxonomy, phylogeny) <i>Lunch</i> Lab 1 (1. Safety and Equipment; Dissections, Key to Families) <i>Dinner</i>	<i>Reading:</i> Lab 1
Friday 07/07	7:00-8:00a 8:00a-12:00p 12:00-1:00p 1:00p-5:00p 5:00p-6:00p 7:00-8:00p	<i>Breakfast</i> Lectures 3-4 (3. Field Collection & Preservation Methods, 4. Jaws, fins, & bones; Agnatha vs. Gnathostomata) <i>Lunch</i> Field trip (Perry's Monument Beach) & Lab 2 (2. Fish ID – Petromyzontiformes, Acipenseriformes, Amiiformes, Clupeiformes, Cypriniformes, Siluriformes, Esociformes) <i>Dinner</i> <i>Stone Lab Lecture Series</i>	<i>Reading:</i> Lab 2, Field Trip 1
07/09	7:00-8:00a 8:00a-12:00p 12:00-1:00p 1:30-2:00p 2:30-4:00p 5:00p-6:00p	<i>Breakfast</i> Lectures 5-7 (5. Agnatha to Gnathostomata to Teleostei, 6. Diversity, Form & Function, 7. The weird and the wonderful!) <i>Lunch</i> Lab Quiz 1 Field trip (Terwilliger's Pond) <i>Dinner</i>	<i>Reading:</i> Field Trip 2 Lab Quiz 1
WEEK TWO: Fish Collection, Behavior, Human Impacts			
Monday 07/10	7:00-8:00a 8:00-12:00p 12:00-1:00p 1:00p-4:45p 5:00p-6:00p	<i>Breakfast*</i> Lecture <i>Lunch</i> Midterm 1 Lab 5 (Behavior Project – introduction to fish behavior) <i>Dinner</i>	<i>Reading:</i> Field Trip 3 & 4 Midterm 1
Wednesday 07/12	7:00-8:00a 8:00a-12:00p 12:00-1:00p 1:00-5:00p 5:00p-6:00p	<i>Breakfast</i> Field trip (Mainland) <i>Lunch</i> <i>Field Trip</i> <i>Dinner</i>	<i>Reading:</i> Simpson et. al., 2015, Lab 5 handout Mainland Field Trip
Friday 07/14	7:00-8:00a 8:00a-12:00p 12:00-1:00p 1:00-5:00p	<i>Breakfast</i> Lake Trawling Lunch Lectures 8-10 (8. Fish Behavior, 9. Reproduction & Diversity, 10. Applied Fish Behavior) <i>Lunch</i>	<i>Reading:</i> Sutter et. al., 2012; Pratt & Lauer, 2013; Labs 3 & 4



	5:00-6:00p	Labs 3&4. (3. Fish ID – Cypriniformes, Salmoniformes, Atheriniformes, 4. Fish ID – Perciformes, Cyprinodontiformes, Scorpaeniformes) <i>Dinner</i>	
WEEK THREE: Even More Fish Collection and Behavior			
Monday 07/17	7:00-7:30a 7:30a-12:00p 12:00-1:00p 1:00p-4:45p 5:00p-6:00p	<i>Breakfast*</i> Field trip (Snorkeling/Seining GIB) <i>Lunch</i> Lab Quiz 2 Lab 6 (Behavior Project; Collection ID) <i>Dinner</i>	<i>Reading:</i> Field Trip 5 & 6 Lab Quiz 2
Wednesday 07/19	7:00-7:30a 7:30a-12:00p 12:00-1:00p 1:00-5:00p 5:00p-6:00p	<i>Breakfast*</i> <i>Field trip (Castalia Fish Hatchery)</i> <i>Lunch (boxed)</i> <i>Field trip (Bacon Woods)</i> <i>Dinner</i>	<i>Reading:</i> Field Trip 7 Mainland Field Trip
Friday 07/21	7:00-8:00a 8:00-9:00a 9:00-12:00p 12:00-1:00p 1:00-5:00p 5:00-6:00p	<i>Breakfast</i> Midterm 2 Field Trip (North Bass Island) <i>Lunch</i> Lab 8 (Behavior Project; Collection ID) <i>Dinner</i>	<i>Reading:</i> Midterm 2
WEEK FOUR: Collection and Behavior Projects			
Monday 07/24	7:00-7:30a 7:30a-12:00p 12:00-1:00p 1:30-2:00p 2:00-5:00p 5:00-6:00p	<i>Breakfast*</i> Field Trip (Boat Electrofishing) <i>Lunch</i> Lab Quiz 3 Lab 9 (Behavior Project – analysis & time to work on presentation) <i>Dinner</i>	<i>Reading:</i> Lab Quiz 3
Wednesday 07/26	7:00-8:00a 8:00a-12:00p 12:00-1:00p 1:00-1:30p 2:00-5:00p 5:00-6:00p	<i>Breakfast</i> Behavior Project Group Presentations <i>Lunch</i> Lab Quiz 4 Lab 10 (Collection ID – finish up & writing) <i>Dinner</i>	<i>Reading:</i> Behavior Presentations Lab Quiz 4
Friday 07/28	7:00-8:00a 8:00-11:00a 12:00-1:00p 1:00-3:00p 5:00p	<i>Breakfast</i> Review <i>Lunch</i> Lab and Lecture Exams <i>Move out</i>	Lab and Lecture Exams Collection Report Due

