

EEB 474: Ichthyology, Fall 2016

Monday and Wednesday, 9:05 – 9:55 am, Nielsen Physics Building, Room 304

Instructor: Benjamin P. Keck, PhD
443 Hesler Biology Building

bkeck@utk.edu
974-2821

Office hours: 1:00 – 2:00 pm Monday and by appointment made through email. It's best to start with an email with a few days/times you would be able to meet, and I will respond as quickly as I can. When you email, put EEB474 in the subject line and provide me with enough information to answer any questions.

Labs: Hesler Biology Building 603

Mon. and Wed. 10:10 am – 1:10 pm **OR** Tue. and Thu. 9:40 am – 12:25 pm

TAs **Sam Borstein** sborstei@vols.utk.edu and **Joel Corush** jcorush@vols.utk.edu

Course website: You will find the EEB 474 web page on the Blackboard course management system at <https://bblearn.utk.edu/>. I recommend that you check Blackboard frequently for new announcements, schedule changes, and assignments. There is one, merged course site: “EEB474 Ichthyology Fall 2016.”

Course description: 4 Credit Hours. Evolution, classification, collection, identification, distribution, and biology of fishes with emphasis on freshwater fauna of eastern North America. 2 hours and 2 labs.

Course Learning Objectives: Understand the basic biology of fish, their evolutionary history, and how to identify fishes from around the world, with a concentration on Tennessee fishes.

Broader Learning Objectives: The focus of this course is fishes, but many of the concepts we cover will be placed into a broader scientific context, including: 1) Evolution from origins in deep evolutionary time to recent ecological time-scales, 2) Functional morphology and environmental niche, 3) Interpreting patterns of gene flow and genetic methods, 4) Feeding strategies, and 5) ecological roles and influences on human culture.

Required Books:

Etnier, D.A. and W.C. Starnes. 2001. The Fishes of Tennessee. University of Tennessee Press, Knoxville, TN. ISBN: 0870497111. Available for free: http://trace.tennessee.edu/utk_utpress/2/

Spitzer, M. 2015. Return of the Gar. University of North Texas Press, Denton, TX. ISBN: 1574415999.

Suggested Books:

Page, L.M. and B.M. Burr. 2011. Peterson Field Guide to Freshwater Fishes. 2nd Edition. Houghton, Mifflin, Harcourt, Boston. ISBN: 0547242064

Kells, V.A. and K. Carpenter. 2011. A Field Guide to Coastal Fishes: From Main to Texas. Johns Hopkins University Press, Baltimore. ISBN: 0801898382

Helfman, G. S., B. B. Collette, D. E. Facey, and B. W. Bowen 2009. The Diversity of Fishes. John Wiley & Sons, Hoboken. ISBN: 1405124942

Readings: There will be various readings for lectures throughout the term. These will be announced on Blackboard and/or in class.

Field Trips: There will be a day trip to Little River during lab time the 31st of August and 1st of September. There may be an optional trip to Alabama and Florida over Fall Break, leaving at noon on the 5th, October, and returning evening on the 9th, October: limited to 14 students.

Technology: You may use electronic devices in class for topical applications. Off topic use of these devices is not permitted and will result in that device living next to the podium for the remainder of class. **During exams and quizzes, any electronic device seen on your desk or within sight will result in a grade of zero.**

Grading: I will use the standard UT grading scale without minuses. I will adjust the final grades if appropriate. There will be no extra credit. Any excuse or concern for absence or tardy work should be discussed in a timely manner. There is a total of 800 points available during the course: 400 in Lecture and 400 in Lab.

Lecture Book Chapter:	20	Lab Practical 1:	100
Lecture In Class Group Questions:	80	Lab Practical 2:	100
Lecture term paper:	100	Lab Practical 3:	100
Lecture Mid-term:	100	Lab Practical 4:	<u>100</u>
Lecture Final:	<u>100</u>	Lab total:	400
Lecture total:	400		

Book Chapter: In groups of two or three you will provide a summary of a chapter in Return of the Gar at the beginning of lecture. If you will be using Powerpoint, I need to receive a Powerpoint file no later than 8 PM the day before you will be presenting. The summary should be put into a broader context of topics from class.

In Class Group Questions: There will be two group learning exercises during the term worth 40 points each; date below. If you are absent this day you will need a valid excuse to complete a make-up assignment. Everyone in the group receives the same grade. This will be a discussion-based, problem solving exercise and will probably be very similar to an exam question.

Term Paper: The conservation and restoration of commercial and recreational fisheries along with non-game fishes now has a fairly long history, many spanning multiple decades. For your term paper you will provide a narrative of a restoration or conservation effort of a North American fish, method such as dam removal, or of a river system. This history should include the cause of the decline, legal process involved (if any), restoration/conservation efforts, and current or final outcomes. There are several parts to this, including: Choosing the system and providing a title with main question or goal described in a few sentences (10 pts), five citations (10 pts), outline (10 pts), and paper (70 pts).

Schedule (subject to change):

Week 1: 17 August

Lecture 1: Introduction to ichthyology

Week 2: 22 and 24 August

Lecture 2: Collection and curation of fishes/global diversity/nomenclature

Lecture 3: Basic fish anatomy and habitat

Week 3: 29 and 31 August

Lecture 4: Genetics revolution and phylogenetics of fishes **Paper Topic Due**

Lecture 5: Agnathans and the evolution of jaws

Week 4: 5 and 7 September

Labor Day

Lecture 6: Chondrichthyes 1 and sensory systems

Week 5: 12 and 14 September

Lecture 7: Chondrichthyes 2 and sensory systems

Lecture 8: Chondrichthyes 3

Week 6: 19 and 21 September

Lecture 9: Sarcopterygii and Biogeography 1 **Citations Due**

Lecture 10: Sarcopterygii and tetrapod evolution

Week 7: 26 and 28 September

Lecture 11: Amia, Polypterus, and friends and the evolution of lungs

Lecture 12: Osteoglossiformes and Speciation 1 **Outline Due**

Week 8: 3 and 5 October

Lecture 13: **Group Activity 1**

Lecture 14: Clupeiformes to Gonorhynchiformes

Week 9: 10 and 12 October

Mid-Term

Lecture 15: Cichlids/Borstein

Week 10: 19 and 21 October

Lecture 16: Cypriniformes and Feeding strategies

Lecture 17: Cypriniformes and Life History/Developmental Strategies

Week 11: 24 and 26 October

Lecture 18: Cypriniformes to Gymnotiforms and Convergent Evolution

Lecture 19: Catostomidae to Siluriformes

Week 12: 31 October and 2 November

Lecture 20: Protacanthopterygii and Osmoregulation

Lecture 21: Protacanthopterygii

Week 13: 7 and 9 November

Lecture 22: Acanthomorpha and phenotypic novelty

Lecture 23: Acanthopterygii 1

Week 14: 14 and 16 November

Lecture 24: Acanthopterygii 2, Speciation 2, and Hybridization

Lecture 25: **Group Activity 2**

Week 15: 21 and 23 November

Lecture 26: Acanthopterygii 3 and Biogeography 2 **Term Paper Due**

No Class

Week 16: 28 November

Lecture 27: Acanthopterygii 4 and Rare Fishes

Final Exam

Monday, 5th Dec., 8 AM, normal classroom

Academic integrity:

Academic dishonesty of any sort will not be tolerated. Plagiarism includes the copying of answers, phrases, portions of sentences or the main ideas from ANYONE (including a classmate) on ANY work submitted for a grade (exams, assignments, quizzes, etc).

You are expected to abide by The University of Tennessee honor statement in Biology and in all of your university activities as pledged in the honor code:

“As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.”

(2015-2016 Undergraduate Catalog)

Depending on the offence, penalties for academic dishonesty range from a minimum of a zero for the assignment, to an F for the course, to the filing of formal academic dishonesty charges seeking dismissal from The University of Tennessee. These choices are at the discretion of the instructor, and can occur in either the lecture or the lab portion of the class.

You should be familiar with the requisites of academic honesty and what constitutes academic dishonesty as outlined in the UT Undergraduate Catalog (<http://hilltopics.utk.edu/files/Hilltopics%202015-16.pdf>).

Other information

Disability Services: If you need course adaptations or accommodations because of a documented disability, please contact me privately to discuss your needs. If you have questions or concerns about disabilities or emergency information to share, please contact Disability Services: 2227 Dunford Hall; 974-6807; Email: ods@utk.edu; Website: <http://ods.utk.edu/>).

Student Success Center: The comprehensive source for information, services, and resources to assist your success at UT: <http://studentsuccess.utk.edu>

- 812 Volunteer Boulevard, Greve Hall, room 324, 865 974-6641, Email: studentsuccess@utk.edu

Technical Assistance:

Blackboard, clickers, or general information technology assistance:

- Help Desk: 865 974 9900 (M – F, 8:00 – 5:00)
- OIT Walk-In Help Desk: Commons, 2nd floor Hodges Library
- Turning Technologies (clickers): 866 746 3015

Counseling Center: <http://counselingcenter.utk.edu/>

1800 Volunteer Boulevard, 865 974-2196, Email: counselingcenter@utk.edu