

General Ichthyology (BIO 442)

Lecturer: Stanton Belford, Ph.D.

Office: By appointment

Office Hours: By appointment

e-mail: sbelfor2@utsouthern.edu.edu

Twitter: @MMCBiology

Lecture: TBD

Laboratory: TBD

Teaching Philosophy

Explore, Discover, Empower

I believe that students are explorers possessing prior knowledge from past experiences, seeking to add to an already existing foundation to what they know. Students learn in a variety of ways, and the skills and knowledge obtained are key facets to becoming a productive member of society. Students can learn in any environment, but environments that enhance their curiosity and interest, and related to their life are effectively added to their growing knowledge. The teaching environment is one that emphasizes open-ended questions, which initiate student discussion, and emphasize learning for all levels of diverse learners.

My role as a science educator is to expand students' science literacy by increasing their skills and knowledge of the natural world around them. Students will gain a better sense of stewardship as their present and future behaviors toward the environment will have both direct and indirect effects on it. With this in mind, my instructional methods are based on a constructivism paradigm. Ultimately, my goals focus on (a) determining the quantity and quality of students' prior knowledge (b) using science-inquiry to initiate student-centered discussion and problem-solving, and (c) increasing student interest in science by illustrating the importance of the scientific process in their lives and the environment around them.

Course Description

This course examines the diversity of fishes, which comprise a third of all vertebrates on Earth. Students will primarily gain an overview of global and local fish diversity, with emphasis on identification, classification, anatomy, physiology, evolution and ecology. This course includes three (3) hours of lecture and three (3) hours of laboratory each week. Prerequisites: BIO 111/115/112/116.

Course Objectives

The primary goal of this course is to instill a general awareness for the diversity of fishes in various aquatic systems. Lectures in the course will be devoted primarily to a survey of all fishes, with emphasis on morphology, internal anatomy, distribution, physiology, ecology, conservation, and the economic value of fishes. Lectures may or may not coincide with chapters in your textbook as there are many complex systems and processes that occur in organisms that are best explained using comparative anatomy and evolutionary history.

The laboratory will include examination of preserved specimen from various fishes, student dissections, and individual collections of fishes by students. Some labs will require us to go out to the field to collect specimen to bring back to the lab for further examination and identification.

Please keep in mind that there is no extra credit activity, study guides, reviews, etc. for this course. You are expected to perform as an upper level student on the cusp of attaining your undergraduate degree and in the process of preparing to enter a graduate program.

Course Learning Objectives

Students will understand the classification of fishes.

Students will understand the anatomy and physiology of fishes

Lecture: Helfman, Collette, Facey & Bowen, *The Diversity of Fishes*. Wiley-Blackwell.

Mid-term Grading: (Average of Lecture exams: KE1, KE2, KE3)

A (≥ 90%)	A = 270-300
B (≥80-89%)	B = 240-269
C (≥70-79%)	C = 210-239
D (≥60-69%)	D = 180-209
F (Below 60%)	F = <179

Note: If you miss an exam, it's a score of zero, until you make up that exam to replace the zero.

Final Grading:

Lecture

Lecture Knowledge Experience #1:	100 pts
Lecture Knowledge Experience #2:	100 pts
Lecture Knowledge Experience #3:	100 pts
Lecture Knowledge Experience #4:	100 pts
Lecture Knowledge Experience #5:	100 pts
Lecture Knowledge Experience #6:	100 pts
Lecture Knowledge Experience Final:	100 pts

<u>Laboratory</u>	Laboratory Midterm	100
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Laboratory Final Exam	100
Laboratory Quizzes and Collection	100

Note: Scores made on your quizzes, lecture knowledge experiences (1-6) and your comprehensive final will count as 70% of your overall course grade. Your lab grade will count as 30%.

Grade Scale (Knowledge Experience)	Overall Course Grade Scale
A (≥ 90)	A = 900 - 1000 points
B ($\geq 80-89$)	B = 800 - 899 points
C ($\geq 70-79$)	C = 700 - 799 points
D ($\geq 60-69$)	D = 600 - 699 points
F (Below 60)	F = < 600 points

Attendance

A significant proportion of the assessment material will not be exclusively evident from the PowerPoint presentations, so attendance and quality note-taking are important (do not simply copy the words on the PowerPoint – you can review that later).

You must have a legitimate excuse if you are absent on the day of scheduled knowledge experience or lab quizzes/exams. Should you have to make-up any assessment, the instructor has the right to determine if you can or not. **Make-up** is at least 1 week after the selected date of the exam.

Academic Misconduct: Academic misconduct is a violation of the College's Academic Honor Code. Cheating is strictly prohibited, and the wages of the transgressor is exceedingly difficult.

Title IX: I will adhere to the Title IX policy

Finding out Your Grades: Every effort will be made to grade exams and assignments in a timely fashion. Grades will be delivered to you during class, otherwise make an appointment to see me before or after class. You must also meet with me if you wish to appeal a grade, including the final course grade. Due to the **Family Educational Rights and Privacy Act (FERPA)**, *I will not discuss grades via e-mail or over the telephone.*

Responsibilities: It is imperative that you come to class to expand your scientific knowledge because your textbook is only one resource that you will use to prepare yourself for the various concepts that will be introduced in class. There will be a lot of discussions during each class. Your questions are welcomed!

Students with Disabilities: Any student who feels she/he may need an accommodation based on the impact of a disability should contact the Academic Affairs Office immediately to report their

disability and qualify to receive accommodations from your professors. Once you have done this, you may meet privately with me, to discuss your specific needs. Although you may report your disability at any time, please attempt to make arrangements within the first two weeks of the semester so all appropriate academic accommodations can be arranged for you. It is important that you do this as soon as possible because accommodations are not retroactive and any grade you make prior to such notification will stand. For additional information, contact the Academic Affairs office.

Tentative Course Calendar

Unit	Lecture Topic	Reading	Lab Topic
1	The Science of Ichthyology Systematics	Chapters 1 Chapter 2	Fish diversity and Morphology
	Knowledge Experience #1 Assignment 1, 2 due	Chapters 1, 2	
2	Anatomy		
3	Jawless Vertebrates and origin of Jawed Vertebrates Living in Water	Chapter 3 Chapter 4	
	Knowledge Experience #2 Assignment 3 due	Chapters 3, 4	
4	Radiation and Diversity of Chondrichthyes	Chapter 6	
5	Radiation and Diversity of Osteichthyes	Chapter 8	
	Knowledge Experience #3 Assignment 6, 8 due	Chapters 6, 8	Lab Practical Exam
6	Distribution and Genetics	Chapter 10 Chapter 11	Amphibians
7	Zoogeography	Chapter 12	
	Knowledge Experience #4 Assignment 10, 11 due	Chapters 10, 11	
8	Adaptations	Chapter 16	Reptiles & Snakes

		Chapter 17	
	Knowledge Experience #5 Assignment 16 due	Chapters 16, 17	
9	Fish Behavior	Chapter 18	
	Knowledge Experience #6 Assignment 18 due	Chapters 18	
10	Ecology of Fishes	Chapter 21 Chapter 24	
11	Economical value of Fishes	Chapter 24	
			Lab Practical Final
	Finals	Comprehensive	