

# The University of Findlay

Fall 2022

**The mission of The University of Findlay is to equip our students for meaningful lives and productive careers.**

**Course Number:** ANSC 443: Marine Animal Anatomy, Biology, and Conservation with Lab

**Credit Hours:** 3

**Class Time/Place:** Loop Abroad Thailand; October 3rd-14th, 2022

## **Prerequisites, Co-requisites and Course Description:**

This course is an introduction to marine life: corals, invertebrates, cartilaginous and bony fishes, sea turtles, many groups of birds, and marine mammals. Even for those of you who do not intend to work with aquatic species, an understanding of marine life is important to a complete understanding of zoological medicine. Approximately 30% of living vertebrate species are marine or marine-associated. Many facilities, from sanctuaries across the globe to conservation efforts to AZA-accredited facilities, serve both aquatic and land animals, so an understanding of marine vertebrates can help prepare you for many career options. In addition, it can reinforce your understanding of non-marine vertebrate behavior and anatomy by comparison and contrast.

Koh Tao, which means “Turtle Island,” is home to some of the best diving in the world, with clear waters, coral reefs, and a huge variety of marine vertebrate species. We will be able to observe and study coral reefs and their many inhabitants. We will also be able to learn more about them by seeing them in the context of marine ecosystems.

**Instructor:** Giovana Martins Miranda, DVM; Erica Ward, DVM

**Instructor Contact Information:** [giomartinsm@gmail.com](mailto:giomartinsm@gmail.com); [erica@loopabroad.com](mailto:erica@loopabroad.com)

**Office Hours:** upon request

## **Course Objectives:**

The following Learning Objectives will be addressed or assessed as part of the course:

- **Remember** and **Apply** knowledge learned to identify common marine life in Koh Tao reef systems

- **Understand** the structure, function, and evolution of animals that live in or near marine environments
- **Understand** how corals interact with marine vertebrates
- **Understand** how tides and currents affect marine vertebrates
- **Understand** how wildlife organizations work to assist endangered and at-risk species, with sea turtles as a case study
- **Understand** how environmental factors and climate change affect marine vertebrates
- **Understand** how a sea turtle rehabilitation and rescue facility operates
- **Apply** knowledge gained to identify marine vertebrates in a tropical setting
- **Apply** knowledge gained to identify families, classes, and species of marine vertebrates
- **Analyze** coral reef ecology, evolution, and conservation issues in Thailand and globally
- **Analyze** how the anatomy of structures relates to function and evolution
- **Analyze** how veterinary care for marine mammals differs from veterinary care for non-marine mammals
- **Analyze** how organ systems present in marine vertebrates: integumentary, skeletal, muscular, nervous, endocrine, digestive, respiratory, circulatory, excretory, and reproductive systems
- **Evaluate** the role and importance of specific coral restoration efforts, including artificial reef construction, coral nurseries, and BioRock
- **Evaluate** the similarities and differences in organ systems across the series of animals studied in the course and to those studied in companion animals

#### **Required Textbooks and Other Materials:**

Your course reader includes selected chapters from the following texts:

1. Carrier, Jeffrey C, John A Musick, and Michael R Heithaus. *Biology Of Sharks And Their Relatives*. Boca Raton, Fla.: CRC Press, 2004.
2. Dierauf, Leslie A and Frances M. D Gulland. *CRC Handbook Of Marine Mammal Medicine*. Boca Raton, FL: CRC Press, 2001.
3. Lewbart, Greg. *Invertebrate Medicine*. Ames, Iowa: Wiley-Blackwell, 2012.
4. Mader, Douglas R. *Reptile Medicine And Surgery*. St. Louis, Mo.: Saunders Elsevier, 2006.
5. Noga, Edward J. *Fish Disease*. Ames, Iowa: Wiley-Blackwell, 2010.
6. Roberts, Helen E. *Fundamentals Of Ornamental Fish Health*. Ames, Iowa: Wiley-Blackwell, 2010.
7. Scott, Chad. *The Koh Tao Ecological Monitoring Program, Second Edition*. Koh Tao, Thailand: Conservation Divers Ltd, 2014.

8. Smith, Mark. *The Elasmobranch Husbandry Manual*. Columbus, Ohio: Ohio Biological Survey, 2004.
9. Tully, Thomas N, G. M Dorrestein, and Alan K Jones. *Handbook Of Avian Medicine*. Edinburgh: Elsevier/Saunders, 2009.
10. Wyneken, Jeanette, and Dawn Witherington. *The Anatomy of Sea Turtles*. Miami, FL: U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center, 2001.
11. You will also be provided a collection of journal articles. These articles include research published by the New Heaven Reef Conservation Program on Koh Tao and their international partners.
12. Materials for notes (notebook and/or laptop, writing utensils, etc.), wristwatch, refillable water bottle, dry bag, sunscreen and insect repellent, bathing suit, rash guard, snacks.

**Instructional Strategies:**

Case Analysis	x	Library and Internet Research	x
Debate		Practice/drill	x
Discovery/Independent Research	x	Problem-solving	x
Discussion/Questioning/Interviewing	x	Reading assignments	x
Experiential Learning	x	Role-playing/simulation games	
Field Experience	x	Service Learning	x
Group Presentation		Video/Audio Review and Critique	
Laboratory Experiences	x	Other	
Lecture	x		

**Methods of Assessment:** Your course grade will be determined as follows:

Abstracts		Participation	x
Attendance	x	Peer Evaluation	
Capstone Project		Portfolio	
Case Study		Portfolio Lab Performance	
Exams	x	Presentations	

Group Projects		Professional Evaluation	x
Homework Assignments	x	Quizzes	x
Internet Research		Research project	
Journaling		Other	
Lab Performance	x		
Oral/written review of literature			

**Grading:** Your course grade will be determined as follows:

Exam 1: 20%

Exam 2: 20%

Conservation Quizzes: 20%

Assignments: 20%

Class Participation: 20%

Throughout this course, instructors will assess students on their participation in labs and activities both in and out of the classroom. To do well on this assessment:

- Be sure to do your best in all labs and activities and complete corresponding handouts and pages in workbook
- Be an active and engaged participant (pay attention during class, volunteer answers, ask questions, etc)
- Be a team player and be helpful to your peers and instructors both in and outside the classroom
- Be prepared and on time for all activities

Please note: this is not an exclusive list. A student's behavior, attitude, and actions throughout their Loop Abroad program may have an impact on their Participation and Performance Score.

**Grading Scale/Distribution:**

<u>Grade</u>	<u>Points</u>	<u>Grading Scale</u>
A	4.00	93-100
A-	3.67	90-92
B+	3.33	87-89
B	3.00	83-86
B-	2.67	80-82

C+	2.33	77-79
C	2.00	73-76
C-	1.67	70-72
D+	1.33	67-69
D	1.00	63-66
D-	0.67	62-60
F	0.00	below 60
U	0.00	

**University Honor Code:**

Each and every student of the University will adhere to the following Honor Code:

“I will not knowingly engage in any dishonorable behavior, cheat, steal, lie, or commit any act of plagiarism during any academic work, course, or endeavor. If I observe an act which I believe violates the University’s Honor Code, I may, at my discretion, report it to the appropriate personnel.”

**Student Acknowledgement of University Honor Code:**

“I acknowledge that I have fully complied or will comply with all aspects of the University’s Honor Code in submitting this work.”

**Student Rights and Responsibilities Statement, Article VIII-Academic Integrity:**

<http://catalog.findlay.edu/en/current/Undergraduate-Catalog/Student-Rights-and-Responsibilities-Statement/VIII-Academic-Integrity>

**University Diversity Statement:**

As part of our commitment to achieve excellence, the University of Findlay values and actively promotes a welcoming and supportive environment that honors the many aspects of diversity. We aspire to foster acceptance of, respect for, and appreciation of all persons in our campus community. We celebrate our commonalities and unique differences, and we acknowledge that diversity broadens learning, stimulates creativity, promotes the exchange of ideas, and prepares our students for meaningful lives and productive careers.

## **Course Policies and Practices:**

### Attendance and Participation Policy

Students are expected to attend all class meetings for which they are registered. This is regarded as a matter of individual student responsibility. The only excused reasons for absences will be illness that impairs the ability to attend and function within the classroom setting or an unavoidable personal emergency.

Students are expected to attend all class sessions on all days of class. It will be the responsibility of the student to contact the course instructor or site director, preferably before the absence, to provide the appropriate documentation and verification for the reason for the absence, and to make arrangements with the course instructor for missed work. Students are responsible for all missed class material. Students may be subject to limited participation in hands-on practice at the instructor's discretion if they have missed the underlying material needed to safely perform the task at hand.

**Final Exam Date:** March 12, 2022

**Special Services:** If you are a student with a disability, it is your responsibility to inform your instructor and register with the Office of Disability Services ([ods@findlay.edu](mailto:ods@findlay.edu)) at least one week prior to a needed service so reasonable accommodations can be made.

**Course and Instructor Evaluation:** Each student is expected to complete the course and instructor evaluation which is sent electronically to the student by the Office of the Registrar. The electronic notification comes in the form of an e-mail from the UF Registrar's Office with the following subject line: Online survey for the designated course (e.g., BIOL 102).

**Last Date of Attendance Policy:** Instructors are required to indicate the last known date of attendance when a final grade of "F" or "U" is assigned to a student.

### **Tentative Course Outline:**

This course immediately follows your SCUBA course and some activities will overlap.

#### **Lectures:**

Ecological Monitoring Program- Invertebrate Indicator Species

Ecological Monitoring Program- Coral Reef Ecology

Ecological Monitoring Program – Fish Indicator Species

Ecological Monitoring Program – Conservation projects

Turtle and Shark ID

Basic Aquatic Animal Husbandry and Medicine

Marine Invertebrates

Elasmobranch anatomy and medicine

Bony fish anatomy and medicine

Marine bird anatomy

Marine reptile anatomy and medicine

Sea Turtle Anatomy, Husbandry and Medicine  
Marine mammal anatomy and medicine  
Marine vets in Thailand

**Labs:**

SCUBA Ecological Monitoring- Invertebrate Survey  
SCUBA Ecological Monitoring – Fish survey  
SCUBA Ecological Monitoring – Conservation projects  
Invertebrate and bony fish necropsies  
Bird necropsies (chickens)  
sea turtle hospital cases and necropsies  
Koh Man Nai island: sea turtle nursery work, physical exams, injections, force-feeding, blood draws

**Quizzes:**

Invertebrates  
Fish  
Coral Predators

**Exams:**

Exam 1: Inverts, Fish, Elasmobranchs  
Exam 2: Marine Bird, Reptile, and Mammal Anatomy and Medicine

**Discussion Sessions:**

3-6 review/discussion sessions