

# **I** ILLINOIS

## **IB496 - Advanced Tropical Marine Biology**

### **Spring 2026**

#### **Course Information**

- Course Duration: Full Semester
- Contact Hours: Tuesday, Thursday, 11:00-12:20; 2 x 80-minute lecture periods each week
- Course Format: in-person
- Course Location: NHB4074
- Weekly Hours of Expected Student Work: 6 hours instruction time (lecture hours, plus lab hours), additional: 6 hours outside of class per week
- Credit Hours: 4

#### **Instructor Information**

- Dr. Tanja Hofmann
- Senior Lecturer
- School of Integrative Biology
- Instructor contact information: thofmann@illinois.edu
- Instructor office location: 2010 NHB
- Instructor drop-in hours for students: by appointment
- Teaching Assistant (TA): Tim Legare
- Teaching Assistant contact information: tlegare@illinois.edu
- Teaching Assistant office location: TBC
- Teaching Assistant drop-in hours for students: by appointment

#### **Course Description**

- This course offers a comprehensive exploration of tropical marine ecosystems, focusing on the biogeography, evolution, and ecology of coral reefs, mangroves, and seagrass beds. Students will investigate the function, physiology, behavior, and ecological roles of tropical marine organisms, as well as the evolutionary dynamics of reef systems and their inhabitants.
- Key topics include organismal adaptations to physical and chemical environmental factors, natural processes shaping reef structure and function, and the life history traits, anatomy, and distributions of species within these ecosystems. The course will highlight the interactions between reef fishes and coral communities, as well as the ecological importance and challenges of coral reef fisheries.

- Modern threats—such as thermal bleaching, ocean acidification, nutrient pollution, and disease—will be critically examined, with attention to the ecological processes shaping the future of tropical systems. The course concludes with a critical analysis of natural and human impacts on reefs, seagrass beds, and mangrove ecosystems, emphasizing contemporary strategies for management and conservation.

## Learning Outcomes

In this course, students will:

1. Apply principles of physical oceanography to predict the distribution and biogeography of tropical marine ecosystems
2. Analyze ecological interactions among marine organisms in tropical habitats, including coral reefs, mangroves, and seagrass beds.
3. Identify and compare physiological adaptations of tropical marine species, synthesizing these differences across ecosystems.
4. Integrate ecological and physiological concepts to evaluate the impacts of anthropogenic stressors—such as rising temperatures, pollution, and ocean acidification—on ecosystem resilience.
5. Critically review and synthesize scientific literature from peer-reviewed sources, interpreting its significance for marine conservation through written assignments and presentations.
6. Gain hands-on experience in experimental research, including the care, maintenance, and husbandry of marine cnidarians.
7. Design and conduct physiological experiments, analyze results, and communicate findings in the context of ecological and physiological theory.
8. Effectively present scientific data related to tropical marine systems to both specialist and non-specialist audiences.
9. Evaluate current conservation and management strategies by applying course concepts to real-world case studies.

## Prerequisites

N/A

## Course Materials

### Learning Management System

Canvas will contain all lecture and assessment material

### Required and Recommended Course Readings

There is no textbook for this course. All required and recommended reading will consist of scientific publications and links will be provided in Canvas.

### Required and Recommended Materials

Students will need access to a laptop for the course.

### Required Software

Students are required to use Microsoft Office programs for completion of assignments and lab work. These can be purchased/downloaded from the [Webstore](#) [Microsoft Office](#)

## Course Requirements and Policies

### Course component and grading breakdown

Instructional Activity	Point Value	Total Points
In-class weekly paper discussion scores Best 20	100	10%
Exam Unit 1 – Coral reef, seagrass and mangrove biology	250	25%
Exam Unit 2 – Threats to and conservation of tropical marine systems	250	25%
Lab 1 – Virtual coral survey, data collection, analysis and results presentation	50	5%
Lab 2 – Virtual coral practical, results analysis, results presentation and discussion in context of literature	50	5%
Lab 3 - Final Project, Scientific lab investigation, impact of environmental factor on reef animals (scientific paper write-up)	200	20%
Lab 4 - Final Presentation, Research conservation case study (oral poster)	100	10%

## Late Assignment Policy

1% will be deducted from total grade each day after due date for each assignment, no points are deducted if instructor is contacted at least 2 days in advance of due date with extenuation circumstances.

## Class Attendance

The [Student Code](#) states "Regular class attendance is expected of all students at the university." In class discussions form part of grading (see above) and absences will impact on students' final outcome, unless students follow absence policy as outlined below.

## Absence Policy

The [Student Code](#) outlines those circumstances in which a student may be eligible to obtain a letter from the Office of the Dean of Students for missed class. When eligible, students must submit an [absence letter request](#) within two weeks of returning to class following the absence.

## Participation

There are expectations and/or grading based on class participation/discussion. See above for how participation will be calculated for the grade.

## Final Letter Grades/ Grading Scale

Final letter grades are determined based on [point ranges](#) (see below).

Percentage	Letter Grade
98.00% - 100.00%	A+
93.00% - 97.99%	A
90.00% - 92.99%	A-
87.00% - 89.99%	B+
83.00% - 86.99%	B
80.00% - 82.99%	B-
77.00% - 79.99%	C+
73.00% - 76.99%	C
70.00% - 72.99%	C-
67.00% - 69.99%	D+
63.00% - 66.99%	D
60.00% - 62.99%	D-
59.99% and below	F

## Additional Course and Campus Policies

### Academic Integrity

The University of Illinois Urbana-Champaign [Student Code](#) should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the [Academic Integrity Policy](#). Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

### Responsible Use of AI in Completing Coursework

Advancements in Artificial Intelligence (AI) provide students with unparalleled access to information and problem-solving capabilities. However, with these advantages come the responsibilities of ethical use and academic integrity. This statement outlines the expectations and guidelines for the responsible use of AI in our course:

The use of generative AI tools is permitted in this course for the following activities:

- Brainstorming and refining your ideas;
- Fine tuning your research questions;
- Finding information on your topic;
- Drafting an outline to organize your thoughts; and
- Checking grammar and style.

Consequences for misuse: Misuse of AI tools in coursework, which includes but is not limited to producing unoriginal work, uncited use of AI-generated content, or unauthorized assistance on assessments, will be considered a breach of academic integrity. Consequences will follow the UIUC's policies on academic dishonesty as detailed in this syllabus, which may include grade penalties, course failure, or more severe disciplinary actions.

### Students with Disabilities

The University of Illinois is committed to ensuring that all students, including those with disabilities, do not experience barriers to learning and participating fully in class. If you have a letter of accommodation from DRES and have not already given it to me, please do so as soon as possible to ensure your accommodation needs are met.

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may:

- Visit: 1207 S. Oak St., Champaign
- Contact: 217-333-1970
- Email: [disability@illinois.edu](mailto:disability@illinois.edu)
- Visit: [DRES website](#)

## **Family Educational Rights and Privacy Act (FERPA)**

The federal Family Educational Rights and Privacy Act ([FERPA](#)) affords students certain rights with respect to their education records

## **Mental Health**

Significant stress, mood changes, excessive worry, substance/alcohol misuse or interferences in eating or sleep can have an impact on academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings which are covered through the Student Health Fee. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do for yourself and for those who care about you.

- [Counseling Center](#) 217-333-3704
- [McKinley Health Center](#) 217-333-2700
- National Suicide Prevention Lifeline 800-273-8255
- Rosecrance Crisis Line 217-359-4141 (available 24/7, 365 days a year)

If you are in immediate danger, call 911.

## **Community of Care**

As members of the Illinois community, we each have a responsibility to express care and concern for one another. If you come across a classmate whose behavior concerns you, whether in regard to their well-being or yours, we encourage you to refer this behavior to the Connie Frank CARE Center (formerly the Student Assistance Center) in the Office of the Dean of Students. You may do so by calling 217-333-0050 or by submitting an [online referral](#). Based on your report, staff in the Student Assistance Center will reach out to offer support and assistance.

Further, as a Community of Care, we want to support you in your overall wellness. We know that students sometimes face challenges that can impact academic performance (examples include mental health concerns, food insecurity, homelessness, personal emergencies). Should you find that you are managing such a challenge and that it is interfering with your coursework, you are encouraged to contact the [Connie Frank CARE Center](#) (formerly the Student Assistance Center) in the Office of the Dean of Students for support and referrals to campus and/or community resources.

## **Disruptive Behavior**

Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students' ability to learn and an instructor's ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the [Office for Student Conflict Resolution](#). For Disciplinary action visit:

- Email: [conflictresolution@illinois.edu](mailto:conflictresolution@illinois.edu)
- Contact: 217-333-3680

## **Emergency Response Recommendations**

Emergency response recommendations and campus building floor plans can be found on the [Division of Public Safety website](#). I encourage you to review this website within the first 10 days of class.

## **Religious Observances**

It is the policy of the University of Illinois Urbana-Champaign to reasonably accommodate its students' religious beliefs, observances, and practices that conflict with a student's class attendance or participation in a scheduled examination or work requirement, consistent with state and federal law. Students should make requests for accommodation in advance of the conflict to allow time for both consideration of the request and alternate procedures to be prepared. Requests should be directed to the instructor. The [Office of the Dean of Students](#) provides an optional resource to assist students in making such requests.

## **Sexual Misconduct Reporting Obligation**

The University of Illinois is committed to combating sex-based misconduct. Faculty and staff members are required to report any instances of sex-based misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: [wecare.illinois.edu/resources/students/#confidential](http://wecare.illinois.edu/resources/students/#confidential).

Other information about resources and reporting is available here: [wecare.illinois.edu](http://wecare.illinois.edu).

## Veterans and Military Students

As a military-friendly institution, and per federal regulations and Illinois statutes, the University of Illinois Urbana-Champaign has established policies and procedures to accommodate military-connected students. In addition to the support available at the [Chez Veterans Center](#), members of the National Guard or Reserves and active-duty military personnel with military obligations (e.g., deployments, training, drills) are encouraged to communicate these, in advance whenever possible, to the instructor. The policy for Excused Absences and Departure from the University for U.S. Military or other U.S. National Defense Services can be found at [Student Code website](#).

## Course Schedule/Outline

Week	Date	Day	Lecture subject	Lecture no	Lecture topic	Labs
1	2025-01-20	T			Introduction to course	No lab
	2026-01-22	T	Unit 1 : Introduction to tropical marine systems - Coral reef biology, marine species, seagrass and mangrove systems	1&2	Intro to coral reefs: Evolution & biogeography of coral reefs	
2	2026-01-27	T		3-5	Coral reef importance, global status, assessment and monitoring	Lab 1 - Coral reef virtual survey, data collection, analysis and results presentation
	2026-01-29	T		3-5	Coral reef biology I - Taxonomy, heterotrophy	

					and photobiology	
3	2026-02-03	T		6-8	Coral reef biology II - Calcification and growth	Lab 2 - Impact of light intensity on zooxanthallea virtual practical, results analysis and presentation of results
	2026-02-05	T		6-8	Coral reef Biology III/IV - Reproduction, larval dispersal and connectivity	Hand in Lab 1 (5%)
4	2026-02-10	T		9-11	Phyto and zooplankton	Lab 2 - Impact of light intensity on zooxanthallea virtual practical, literature review and discussion
	2026-02-12	T		9-11	Algae, invertebrates and reef fish	
5	2026-02-17	T			Well-being day	Lab 3 - Start research project - Introduction and literature search (pH & Daphnia, predator response of snails, temperature/light & anemones/coral)
	2026-02-19	T		12	Marine mammals - Cetaceans and Sirenia	Hand in Lab 2 (5%)

6	2026-02-24	T		13-15	Marine reptiles - Sea turtles	Lab 3 - Planning and material requests - write-up intro and methods
	2026-02-26	T		13-15	Marine reptiles - Iguanas, crocodiles and snakes	
7	2026-03-03	T		16-17	Mangrove ecosystems	Lab 3 - Set up experiments - complete write up of intro and methods
	2025-03-05	T		16-17	Seagrass ecosystems	
8	2026-03-10	T			Review lecture	Lab 3 - Data collection 1
	2026-03-12	T			Exam 1 (25%)	
	2026-03-17	T	Spring break		No class	
	2026-03-19	T	Spring break		No class	
9	2026-03-24	T	Unit 2 - Threats to tropical marine	18-20	Marine ecology introduction &	Lab 3 - Data collection 2

			systems, community analysis and mitigation		coral reef ecology	
	2026- 03-26	T		18-20	Marine community ecology DMSP production	
10	3036- 03-31	T		21-23	Marine community ecology methods - DNA to characterise communities	Lab 3 - Data collection <sup>32</sup> - analyze and present results
	2026- 04-02	T		21-23	Threats to tropical marine systems I/II - anthropogenic pollution and importance and impact of fisheries	
11	2026- 04-07	T		24-26	Threats to tropical marine systems III - importance and impact of invertebrate fisheries	Lab 3 - Write-up Scientific Paper Format - complete discussion and abstract
	2026- 04-09	T		24-26	Threats to tropical marine systems IV/V - coral mining and importance and impact of tourism	
12	2026- 04-14	T			Well-being day	Lab 4 - Start posters - Threats

						and conservation of coral reefs
	2026-04-16	T		27&28	Threats to tropical marine systems VI /VII- disease and corallivores, climate change and acidification	Hand in Lab 3 (20%)
13	2026-04-21	T		29-31	Threats to tropical marine systems VIII - climate change and coral bleaching	Lab 4 - Complete poster presentations and practice
	2026-04-23	T		29-31	Coral reef conservation and restoration	Hand in Lab 4 posters (5%)
14	2026-04-28	T		32&33	Deep sea communities and cold water corals	Lab 4 - Oral poster presentations (5%)
	2026-04-30	T		32&33	Deep sea communities and hydrothermal vents	
15	2026-05-05	T			Review lecture	
	2026-05-07	T			Exam 2 (25%)	

## Rules of the laboratory

Students won't be allowed in the lab or points will be deducted if these rules are not followed.

1. Food and drink are not allowed in the laboratories. Keep drinks in your backpacks. You are allowed to drink in the backpack area.
2. Bare feet, flip-flops and sandals are not allowed in the labs that require the use of chemicals (PTC lab); closed-toe shoes are required. Full-length pants or equivalent are required. Students won't be allowed in the lab if this rule is not followed.
3. The use of cell phones is not allowed unless the lab activities require it.
4. Coats (or extra apparel), backpacks, and bags must be stored in the cabinets, on the metal racks, or under the lab benches or chairs.
5. The walking areas must be completely clear.
6. Assume that all chemicals of unknown toxicity are highly toxic.
7. Do not perform any unauthorized experiments. Do not use equipment without instruction.
8. Microscopes and slides must be cleaned and returned to the bench for later sections.
9. The labs must be cleaned by the students after each lab. This includes the lab tables, the sink, and, if necessary, the floor. Use the sponges and paper towels provided. Wipe the lab bench down at the end of every lab. Put away all supplies.
10. Wash your hands with soap before leaving the laboratory.
11. Labs start on time and students are allowed to leave only when the TA dismisses the class.
12. The TAs and the classroom assistant oversee the orderly conduct of labs and may exclude a student who does not comply with a reasonable request in this regard.
13. The TAs and prep staff are not responsible for any student belongings during labs; only the necessary items to labs.