# Marine Adaptations – FAS6154 Distance Students, Sections 6940, 6941, 6965

## **1** Course Overview



**Course description:** Dive into the wild world of marine survival! In this course, we will explore how marine organisms tackle the challenges of their environment. From salty seas and low oxygen levels to ocean acidification, rising temperatures, pollution, UV radiation, and underwater noise, we will uncover the incredible physiological responses that keep marine life thriving. Journey through diverse habitats like estuaries, polar regions, coral reefs, the deep sea, rocky shores, marshes, and the open ocean. Along the way, we will also connect these stressors to the bigger picture of marine ecology and discuss their societal, economic, and management implications. Get ready for an ocean adventure like no other! (Figure generated by ChatGPT)

- 3 Credits
- Fall 2024
- Format: 100% Online
- http://elearning.ufl.edu

**Prerequisites:** BSC 2010 and 2011 or equivalent; courses in animal physiology and ecology are recommended.

#### Instructor: Dr. Shirley Baker

- Please use the Canvas message/Inbox feature for fastest response.
- Office hours: In-person or virtual (Zoom) office hours Thursdays 1pm
- Phone: 352-273-3627, Text: 352-213-3808

#### Teaching Assistant: Gabriele Love

- Please use the Canvas message/Inbox feature for fastest response.
- Office hours: Virtual office hours by appointment.

Textbook(s) and/or readings: There is no required text for the course.

## 2 Learning Outcomes

By the end of this course, you will be able to:

- Explain how different stressors affect the physiology and ecology of marine species and ecosystems.
- Contrast the unique ways various marine species adapt to environmental stress.
- Investigate how stressors and physiological responses influence ecological patterns in marine habitats.
- Assess and integrate innovative research in marine science.

# **3** Course Logistics

Students may access assignments, readings, and supporting materials through the course Canvas site as they become available.

#### **Technology Requirements:**

- A computer or mobile device with high-speed internet connection.
- A webcam, headset and/or microphone, and speakers.
- Latest version of web browser. Canvas supports only the two most recent versions of any given browser. What browser am I using?

**Synchronous online sessions may be recorded.** By sharing your video, screen, or audio during any synchronous online class sessions, you are consenting to being recorded for the benefit of students who cannot attend live as well as for class review during the current semester. If you have special circumstances or concerns about privacy, it is your responsibility to discuss it with your instructor.

### **3.1** Description of Assessments & Activities

**Introduction: 1 @ 5 points, due in Canvas.** Please introduce yourself in the designated Canvas Discussion forum. Make sure to read and comment on your peer's introductions as well. Your participation will be assessed based on how clear and coherent your introduction is, as well as how professionally you engage with your classmates.

**Quizzes: 6 @ 10 points each.** Quizzes will be conducted via Canvas according to the schedule provided. They will include multiple-choice questions, short answers, and brief essays. While quizzes are "open notes," they will challenge you to think critically, integrate information, and apply interdisciplinary concepts. Quizzes will only be available during the specified dates.

**Perusall: 13 @ 5 points each.** Every week, we will dive into primary literature relevant to our course topics. I will upload scientific papers to Perusall, accessed through Canvas. You are expected to read the entire paper, annotate key content, pose questions or comments that prompt discussion, and upvote peers' contributions.

**Reading Reflection: 13 @ 2 points each.** To foster a deeper understanding and engagement with the assigned Perusall reading, you will submit a brief reflection (< 100 words) about how the annotations and discussions with peers that impacted your understanding of the text.

**"Choose Your Own Adventure" Project:** Throughout the semester, you will focus on a chosen topic, culminating in a final project. This scaffolded assignment includes six components. For detailed instructions and expectations, please refer to the assignment descriptions and grading rubrics in Canvas.

- 1. **CYOA Topic Selection: 1 @ 5 points.** Select a physiological challenge faced by an organism that interests you. Key physiological problems include osmoregulation, respiration and oxygen availability, thermoregulation, reproduction and development, UV radiation and photoprotection, nutrient acquisition, acid-base balance, etc. Assessment will be based on relevance and clarity of the proposal.
- 2. CYOA Annotated Bibliography: 1 @ 20 points. Compile a list of at least ten scholarly sources (journal articles, books, reports) related to your chosen topic. For each source, provide a brief Informative Summary of the main points, an Evaluative Assessment, and a discussion of the relevance to your topic. Assessment will be based on relevance, quality and diversity of sources, informative summary, critical evaluation, citation style compliance, organization, and overall professionalism.
- **3. CYOA Project Proposal: 1 @ 5 points.** You will use what you learned from compiling your CYOA Annotated Bibliography to develop a project. In this assignment, you will indicate the specific topic you will work on, your intended audience, and the specific medium in which you will work. Media my include: a literature review paper, a research proposal, a meta-analysis, a thematic analysis, a comparative study, a case-study analysis, an educational resource, a critical essay, a presentation, a policy brief, a research blog, an infographic, etc. Choose something useful for your current or future career!
- **4. CYOA Project Final Project: 1 @ 30 points.** Assessment of your CYOA Final Project will be based on project quality and creativity, effective use of the chosen medium, and clarity of communication for the chosen audience. Projects will be posted in Canvas for all students to view.
- **5. CYOA Peer Review: 2 @ 5 points**. You will provide feedback on the CYOA Projects of two assigned peers. Assessment will be based on thoroughness, constructiveness, and professionalism of feedback to peers.
- 6. CYOA Participation Discussion: 1@ 5 points. In addition to the two assigned Projects on which you will provide feedback, students will view the Projects of their peers, ask questions, and post comments in Canvas Discussion boards. Assessment will be based on active and professional participation.

Grading Scale (%) A 100% to 94% A- 93.99% to 90% B+ 89.99% to 87% B 86.99% to 84% B- 83.99% to 80% C+ 79.99% to 77% C 76.99% to 74% C- 73.99% to 70% D+ 69.99% to 64% D- 63.99% to 61% E 60.99% to 0%

#### **3.2** Grades & Grading Scale

Introduction, 1 @ 5 points	5 points
Quizzes, 6 @ 10 points each	60 points
Perusall, 13 @ 5 points each	65 points
Reading Reflection, 13 @ 2 points each	26 points
CYOA Topic Selection, 1@ 5 points	5 points
CYOA Annotated Bibliography, 1@ 20 points	s 20 points
CYOA Project Proposal, 1 @ 5 points	5 points
CYOA Final Project, 1 @ 30 points	30 points
CYOA Peer Review, 2 @ 5 points	10 points
CYOA Participation Discussion, 1 @ 5 points	5 points
TOTAL	231 points

For information on current UF policies for assigning grade points, see Ugrad <u>https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx</u> Grad <u>https://catalog.ufl.edu/graduate/regulations/#text</u>

# 4 Learning Content

Week	Topic, Assignments, and Due Dates
1	First day of class - Introductions, Syllabus, Expectations
	Effects of <b>salinity</b> as a stressor
	Tuesday, August 27
2	<ul> <li>Introduction – Introduce yourself – by midnight</li> </ul>
	Thursday, August 29
	<ul> <li>Perusall, Week 2 – by 2pm</li> </ul>
	September 2: Labor Day
	Effects of changing <b>salinity</b> on ecology
	Tuesday, September 3
	<ul> <li>Introduction – Respond to peers</li> </ul>
3	<ul> <li>Reading Reflection, Week 2 – by midnight</li> </ul>
	Thursday, September 5
	<ul> <li>Perusall, Week 3 – by 2pm</li> </ul>
	<ul> <li>CYOA Topic Selection – by midnight</li> </ul>
	Respiratory responses to <b>hypoxia</b>
	Tuesday, September 10
4	<ul> <li>Reading Reflection, Week 3 – by midnight</li> </ul>
-	Thursday, September 12
	<ul> <li>Perusall, Week 4 – by 2pm</li> </ul>
	<ul> <li>Quiz, Salinity – by midnight</li> </ul>
	Ecological consequences of hypoxia
	Tuesday, September 17
5	<ul> <li>Reading Reflection, Week 4 – by midnight</li> </ul>
	Thursday, September 19
	• Perusall, Week 5 – by 2pm
	Physiological effects of ocean acidification
	Tuesday, September 24
	<ul> <li><i>Reading Reflection, Week 5</i> – by midnight</li> </ul>
6	Thursday, September 26
	<ul> <li>Perusall, Week 6 – by 2pm</li> </ul>
	<ul> <li>Quiz, Hypoxia – by midnight</li> </ul>
	<ul> <li>CYOA Annotated Bibliography - by midnight</li> </ul>
	Ecological effects of ocean acidification
	Tuesday, October 1
7	<ul> <li>Reading Reflection, Week 6 – by midnight</li> </ul>
-	Thursday, October 3
	<ul> <li>Perusall, Week 7 – by 2pm</li> </ul>
	<ul> <li>CYOA Project Proposal- by midnight</li> </ul>

Physiological responses to thermal stress
Tuesday, October 8
• <b>Reading Reflection, Week 7</b> – by midnight
Thursday, October 10
<ul> <li>Perusall, Week 8 – by 2pm</li> </ul>
<ul> <li>Quiz, OA – by midnight</li> </ul>
Effects of thermal stress on ecological processes
Tuesday, October 15
<ul> <li>Reading Reflection, Week 8 – by midnight</li> </ul>
Thursday, October 17
<ul> <li>Perusall, Week 9 – by 2pm</li> </ul>
October 18-19: Homecoming
Chemical pollutants in the marine environment and physiological impacts
Tuesday, October 22
<ul> <li>Reading Reflection, Week 9 – by midnight</li> </ul>
Thursday, October 24
<ul> <li>Perusall, Week 10 – by 2pm</li> </ul>
<ul> <li>Quiz, Thermal Stress – by midnight</li> </ul>
Nitrogen stress in the marine environment
Tuesday, October 29
• Reading Reflection, Week 10 – by midnight
Thursday, October 31
<ul> <li>Perusall, Week 11 – by 2pm</li> <li>United and the second seco</li></ul>
Halloween Costume Extra Crealt – In class
Physiological responses to, and ecological impacts of, <b>UV radiation</b>
Iuesuay, November 5     Deading Poflection Week 11 hymidnight
• Thursday, November 7
• Hursuay, November 7 $\bigcirc$ <b>Derusali Week 12</b> – by 2pm
<ul> <li>Ouiz Pollutants &amp; Nitrogen - hy midnight</li> </ul>
November 11: Veterans Dav
Physiological effects and ecological impacts of underwater <b>noise</b>
• Tuesday. November 12
<ul> <li>Reading Reflection, Week 12 – by midnight</li> </ul>
• Thursday, November 14
<ul> <li>Perusall, Week 13 – by 2pm</li> </ul>
<ul> <li>CYOA Final Project – by midnight</li> </ul>
Managing stressors in the marine environment
• Tuesday, November 19
<ul> <li><i>Reading Reflection, Week 13</i> – by midnight</li> </ul>
Thursday, November 21
<ul> <li>Perusall. Week 14 – by 2pm</li> </ul>

	November 25-30: Thanksgiving Break
	Choose Your Own Adventure Discussions
	Wednesday, December 4
15	<ul> <li>Reading Reflection, Week 14 – by midnight</li> </ul>
	<ul> <li>CYOA Peer Review – by midnight</li> </ul>
	<ul> <li>CYOA Participation Discussion – by midnight</li> </ul>

### 4.1 Readings

Representative examples:

Craig, J.J. 2012. Aggregation on the edge: effects of hypoxia avoidance on the spatial distribution of brown shrimp and demersal fishes in the Northern Gulf of Mexico. *Marine Ecological Progress Series* 445: 75-95.

Decelle, J., Anderson, A., & Hourdez, S. 2010. Morphological adaptations to chronic hypoxia in deep-sea decapod crustaceans from hydrothermal vents and cold seeps. *Marine Biology* 157: 1259-1269.

Long, W.C., Swiney, K.M., Harris, C. Page, H.N., & Foy, R.J. 2013. Effects of ocean acidification on juvenile red king crab (*Paralithodes camtschaticus*) and tenner crab (*Chionoecetes bairdi*) growth, condition, calcification, and survival. *PLoS ONE* 8: e60959.

Rodrigues, A.P., Oliveira, P.C., Guilhermino, L. & Guimaraes. L. 2012. Effects of salinity stress on neurotransmission, energy metabolism, and anti-oxidant biomarkers of *Carcinus maenus* from two estuaries of the NW Iberian Peninsula. *Marine Biology* 159: 2061-2071.

Shone, BR., Flessa, K.W., Dettman, D.L. & Goodwin, D.H. 2003. Upstream dams and downstream clams: growth rates of bivalve mollusks unveil impact of river management on estuarine ecosystems (Colorado River Delta, Mexico). *Estuarine, Coastal and Shelf Science* 58: 715-726.

# **5** Policies and Requirements

This course plan and syllabus are subject to change in response to student and instructor needs. Any changes will be clearly communicated in advance through Canvas.

### 5.1 Late Submissions & Make-up Requests

It is the responsibility of the student to access on-line lectures, readings, quizzes, and exams and to maintain satisfactory progress in the course. Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: <a href="https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx">https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx</a>

Computer or other hardware failures, except failure of the UF e-Learning system, will not excuse students for missing assignments. Any late submissions due to technical issues MUST be accompanied by the ticket number received from the Helpdesk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request consideration.

For computer, software compatibility, or access problems call the HELP DESK phone number—352-392-HELP = 352- 392-4357 (option 2).

#### **5.2** Communication Courtesy and Professionalism

Just as in any professional environment, meaningful and constructive dialogue is expected in this class and requires a degree of mutual respect, willingness to listen, and tolerance of opposing points of view. **Respect for individual differences and alternative viewpoints will be always maintained in this class.** All members of the class are expected to follow rules of common courtesy, decency, and civility in all interactions. Failure to do so will not be tolerated and may result in loss of participation points and/or referral to the Dean of Students' Office.

#### **5.3** Semester Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning.

At approximately the mid-point of the semester, the School of Forest, Fisheries, & Geomatics Sciences will request anonymous feedback on student satisfaction on various aspects of this course. These surveys will be sent out through Canvas and are not required but encouraged. This is <u>not</u> the UF Faculty Evaluation!

At the end of the semester, students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <a href="https://gatorevals.aa.ufl.edu/students/">https://gatorevals.aa.ufl.edu/students/</a>. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <a href="https://ufl.bluera.com/ufl/">https://ufl.bluera.com/ufl/</a>. Summaries of course evaluation results are available to students at <a href="https://gatorevals.aa.ufl.edu/public-results/">https://gatorevals.aa.ufl.edu/public-results/</a>.

#### 5.4 Academic Honesty Policy

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* 

You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless them instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct or appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic

integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated.

Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <a href="http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code">http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code</a>.

### 5.5 Inclusive Learning Environment

This course embraces the University of Florida's Non-Discrimination Policy, which reads,

The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act.

If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see the instructor or refer to the Office of Multicultural & Diversity Affairs website: <u>http://multicultural.ufl.edu</u>.

### 5.6 Services for Students with Disabilities:

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. 0001 Reid Hall, 352-392-8565, <a href="http://www.disability.ufl.edu">http://www.disability.ufl.edu</a>

### 5.7 Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

# **6** Campus Helping Resources

For issues with technical difficulties for e-learning in Canvas, please post your question to the Technical Help Discussion in your course, or contact the UF Help Desk at:

- Learning-support@ufl.edu | (352) 392-HELP select option 2 | http://elearning.ufl.edu
- Library Help Desk support <a href="http://cms.uflib.ufl.edu/ask">http://cms.uflib.ufl.edu/ask</a>
- SFFGS Academic Hub <u>https://ufl.instructure.com/courses/303721</u>

### 6.1 Student Life, Wellness, and Counseling Help

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- Counseling and Wellness resources <a href="http://www.counseling.ufl.edu/cwc/">http://www.counseling.ufl.edu/cwc/</a>
- U Matter, We Care <u>http://www.umatter.ufl.edu/</u>
- Career Connections Center <u>http://career.ufl.edu/</u>
- Other resources are available at <a href="http://www.distance.ufl.edu/getting-help">http://www.distance.ufl.edu/getting-help</a> for online students.

#### 6.2 Student Complaint Process

The School of Forest, Fisheries, & Geomatics Sciences cares about your experience and we will make every effort to address course concerns. We request that our online students complete a course satisfaction survey each semester, which is a time for you to voice your thoughts on how your course is being delivered. You can also submit feedback anytime.

If you have a more urgent concern, your first point of contact should be the Academic Coordinator or the Graduate/Undergraduate Coordinator for the program offering the course. You may also submit a complaint directly to UF administration:

- <u>https://distance.ufl.edu/getting-help/</u>
- https://registrar.ufl.edu/complaint.html