Coastal Resilience and Engineering with Nature
CGN 4905   Section 21159
Class Periods: Monday & Wednesday, and 4:05-5:20 pm
Location: Virtual/Weil Hall 365C
Academic Term: Spring 2025

Instructor:
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Office Phone Number: 601-831-5411
Office Hours: Monday & Wednesday 5:20-6:30 pm or by appointment, office location 365K Weil Hall

Course Description
Introduces concepts of coastal resilience and engineering with nature with a focus on flood risk management. Course topics include coastal system behavior, principles, and frameworks for engineering with nature, stakeholder engagement, benefits and cost, types of natural and nature-based features, and adaptation. Case studies and recent innovations will be discussed. A team project applies concepts to project site.

Course Pre-Requisites / Co-Requisites
none

Course Objectives
- Identify dominant coastal processes based on the environment/region.
- Identify and analyze coastal engineering data sources for project site characterization.
- Identify potential coastal project stakeholders and analyze effective engagement strategies.
- Apply techniques and tools to develop nature-based coastal protection strategies, including adaption.
- Compare and contrast nature-based coastal protection benefits and costs for alternative selection.
- Critique potential impacts of coastal solutions on society and the environment.

Materials and Supply Fees
none

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	Medium
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	High
3. An ability to communicate effectively with a range of audiences	Medium
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	Medium
5. An ability to function effectively on a team whose members together provide leadership, create a	High

	collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6.	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	
7.	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Medium

Required Textbooks and Software
- Title: **International Guidelines on Natural and Nature-Based Features for Flood Risk Management**
- Authors: T. S. Bridges, J. K. King, J. D. Simm, M. W. Beck, G. Collins, Q. Lodder, and R. K. Mohan, eds
- Publication date and edition: 2021; free download: https://ewn.erdc.dren.mil/?page_id=4351
- ISBN number: 978-1-7325904-9-6

Recommended Materials
- Title: **Coastal Engineering Manual**
- Author: US Army Corps of Engineers
- Publication date and edition: 2002; free download: https://www.publications.usace.army.mil/USACE-Publications/Engineer-Manuals/u43544q/636F617374616C20656E67696E656572696E67206D616E75616C/
- ISBN number: none
- Title: **Coastal Dynamics**
- Author: Judith Bosboom and Marcel J.F. Stive
- Publication date and edition: 2021; updated January 11, 2023, free download: https://textbooks.open.tudelft.nl/textbooks/%20catalog/book/37
- ISBN number: 978-94-6366-371-7

Required Computer
UF student computing requirement: *https://news.it.ufl.edu/education/student-computing-requirements-for-uf/*

Course Schedule

Dates	Topics	Textbook	
Week 1	Introduction: Coastal Resilience and Nature-Based Solutions	Chap 1	
Week 2	Coastal Systems	Notes	
Week 3	Coastal Systems	Notes	Quiz 1
Week 4	System Approach to Engineering with Nature; Principles and Frameworks	Chap 4 and 2	
Week 5	Stakeholder Engagement	Chap 3	
Week 6	Benefits and Costs	Chap 6	Quiz 2
Week 7	Beaches and Dunes	Chap 9	
Week 8	Wetland and Tidal Flats	Chap 10	Quiz 3, Project Part 1
Week 9	Islands	Chap 11	
Week 10	Engineering with Nature Guest Lectures		
Week 11	Reefs	Chap 12	Quiz 4
Week 12	Plant Systems	Chap 13	
Week 13	Enhancements to Structure Measures	Chap 14	
Week 14	EwN Performance and Adaptive Management	Chap 5 & 7	Quiz 5
Week 15	Project Presentations		Project Part 2

Important Dates
11 March 2026   Project Part 1 due
20-22 April 2026   Project Part 2 due, Project Presentations

Attendance Policy, Class Expectations, and Make-Up Policy
Students are expected to actively participate in class. Missed assignment or exam makeup must be arranged with the instructor prior to the due date.
Excused absences must be consistent with university policies in the Graduate Catalog (https://catalog.ufl.edu/graduate/regulations) and require appropriate documentation. Additional information can be found here: https://gradcatalog.ufl.edu/graduate/regulations/

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Project (2 parts + presentation)	400	40%
Quizzes (5)	100 each	50%
Discussions (5)	20 each	10%
		100%

Grading Policy

Percent	Grade	Grade Points
90.0 - 100	A	4.00
80.0 – 98.9	B	3.00
70.0 - 79.9	C	2.00
60.0 – 69.9	D	1.00
0.0 – 59.9	F	0.00

More information on UF grading policy may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation
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 https://gatorevals.aa.ufl.edu/students/. 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 https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

In-Class Recording
Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

Commented [RT1]: Description of how undergraduate and graduate assignments/expectations/grading is to be differentiated.

Commented [RT2]: A description of the project topic and scope should be added here (this is expected for any single assignment which constitutes more than 30% of the grade

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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." The Honor Code (https://sccr.dso.ufl.edu/process/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of 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.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Undergraduate Coordinator
• HWCOE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
• Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, pld@ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

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. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

<u>*Health and Wellness*</u>

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: https://counseling.ufl.edu, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

<u>*Academic Resources*</u>

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://elearning.ufl.edu/.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; https://career.ufl.edu.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/;https://care.dso.ufl.edu.

On-Line Students Complaints*:* https://distance.ufl.edu/getting-help/; *https://distance.ufl.edu/state-authorization-status/#student-complaint.*