

ECO 611: Offshore Wind Energy: Environmental Impacts, Siting, Permitting, and Stakeholder Engagement

Spring 2024 Instructor: Max Dilthey (mdilthey@umass.edu)

Synchronous Lecture:

Wednesdays 6:00-7:00PM EST

Office Hours:

Mondays 6:00PM-7:00PM EST

Zoom Link (same link for all Mondays and Wednesdays): <https://umass-amherst.zoom.us/my/maxzoomclassroom>

Course Description:

Before construction begins on an offshore wind farm, developers spend 5-8+ years assessing ecological and human impacts, obtaining federal and state permits, designing the project, and engaging with stakeholders. This process is expensive, lengthy, and vital to the successful installation of an offshore wind farm. This course is designed to guide you through the project development process, from the time a potential offshore wind site has been identified, until construction is complete and the wind farm is operational. In this course, we'll look closely at many aspects of offshore wind project development, including marine spatial planning, environmental impacts, species interactions, state and federal laws, and various stakeholder perspectives. As we explore these topics, you'll also develop your vocabulary and comprehension across different sectors and roles within the offshore wind industry.

This on-line course will consist of **synchronous lectures** and **asynchronous assignments**. All assignments, course readings, and projects will be accessed through the course Canvas site. Students will engage with the instructor and fellow students through Zoom lectures, office hours, and asynchronous discussion boards. All synchronous lectures will be recorded and posted to the Canvas site.

Monday's Office Hours are a supplement to Wednesday's lectures and act as a less formal "second class" where students can discuss offshore wind. Attendance at these lively discussion sections is highly encouraged.

Accessing This Course:

This course uses the online learning platform Canvas for all assignments and course materials. Please log into Canvas using the web portal at <https://www.umass.edu/it/canvas> using your UMass email address and password to access course materials.

Critical course announcements will be communicated to your UMass email. You can set your UMass email to forward to another email address using the instructions here: <https://www.umass.edu/it/support/google-apps/google-mail-faq>

Learning Objectives:

Upon successful completion of this course, students will understand:

- Ocean and benthic environments and ecology
- Threatened/endangered/commercial species of concern
- Pre-and post-construction monitoring and assessment practices
- Impacts of offshore wind construction and operation
- Impact mitigation strategies
- Federal and State ocean jurisdictions
- The Bureau of Ocean Energy Management (BOEM), leasing and auctioning for offshore wind development rights
- Local, state, and federal permits and other laws
- Permitting of subsurface cables, landfall, and interconnection points
- Key stakeholder groups and perspectives
- Engagement, understanding, and finding common ground
- Surveying opinions of stakeholders and general public
- Rules and best practices on public hearings and transparency

Reading Materials:

Readings will be assigned from academic literature and applied professional and governmental reports on present-day offshore wind developments. There is no assigned textbook for the class. All readings will be listed and posted to Canvas. You should come to class having completed the assigned readings, so that we can apply the course material.

Course Outline:

Week 1 (Feb 7) Introduction to Wind Energy	First Class on Wednesday, Feb. 7 at 6PM EST via Zoom: https://umass-amherst.zoom.us/my/maxzoomclassroom Course Introduction Offshore Wind Scale & Resource Potential Wind Energy Basics Wind Turbines, Arrays, Cables: from Land to Sea
Week 2 (Feb 12, 14) BOEM & the Permitting Process	Offshore Wind Leasing Process: Planning, Leasing, Permitting, Construction & Operations, Decommissioning Regulation of Offshore Wind: Agencies, Authorities National Environmental Policy Act (NEPA)

<p>Week 3 (Feb 19, 21) BOEM, Leasing, Site Assessment, Construction and Operations Plan (COP), Section 585 Regulations</p>	<p>(Note: Office Hours <u>will</u> be held on Presidents' Day)</p> <p>Federal Process: Site Assessment Plans (SAP) Construction and Operations Plan (COP) 30 CFR Section 585 regulations State Process: Coastal Zone Management Act</p>
<p>Week 4 (Feb 26, 28) Marine Spatial Planning, Data Portals & Mapping</p>	<p>Siting a Wind Farm: Using mapping and data to identify optimal wind farm locations Marine Spatial Planning In-Class Activity: Data Scavenger Hunt</p>
<p>Week 5 (Mar 4, 6) Marine Mammals and Sea Turtles</p>	<p>Defining major habitats: Regional management, ecosystem-based management (EBM) Marine Mammals & Sea Turtles: Conservation status, species distribution Impacts from offshore wind: pre-construction, construction, operations & maintenance, decommissioning Environmental Impact Statements Marine Mammal Permitting: MMPA, ESA Data Collection: Desktop review, baseline data collection Mitigation Plans for Marine Mammals</p> <p>Midterm Group Project Assigned</p> <p>Guest Speaker TBA</p>
<p>Week 6 (Mar 11, 13) Birds & Bats; Species Distributions, Impacts from Wind, Mitigation Measures</p>	<p>Birds & Bats: Species distributions, conservation status, management Major protections including MBTA, Bald & Golden Eagle Protection Act Impacts from offshore wind: Surveys, Construction, Operations & Maintenance Surveying, Monitoring, Mitigation</p>
<p>Spring Recess - March 18-22 - No Class</p>	
<p>Week 7 (Mar 25, 27) Bringing Offshore Energy Home</p>	<p>Coastal Zone Management Act (CZMA) and the Federal Consistency clause Cable landings on shore Transmission Examples of State and Local Permits Other Environmental Permits: Clean Water Act, National Marine Sanctuaries Act, Rivers & Harbors Act</p>

<p>Week 8 (April 1, 3) Fish: Species Distributions, Impacts from Wind, Mitigation Measures</p>	<p>Benthic & Pelagic Fish, Essential Fish Habitat Major protections including Magnuson Steven Act, Fish & Wildlife Coordination Act Impacts from offshore wind: Surveys, Construction, Operations & Maintenance Surveying, Monitoring, Mitigation</p> <p>Guest Speaker: Kevin Stokesbury, Commonwealth Professor, UMass Dartmouth / SMAST</p>
<p>Week 9 (April 8, 10) Theory of Social Acceptance Stakeholder Engagement</p>	<p>Theory of Social Acceptance Stakeholder engagement NIMBY, public opinion, engagement process Public Perceptions & Stakeholders: Community members, special interest groups, activists, residents Roles and opportunities to engage with offshore wind Baseline surveys, public opinion Case Studies: Cape Wind, Block Island State procurement RFPs and bidding requirements</p>
<p>Week 10 (April 15, 17) Stakeholders: Commercial & Recreational Fishers, Economic Value, Recreation & Tourism</p>	<p><i>(Note: Office Hours <u>will</u> be held on Patriot's Day)</i></p> <p>Fisheries: Resolving Spatial Conflicts; Commercial and Recreational Fisheries, economic value Tourism & Recreation</p> <p>Guest Speaker TBA</p>
<p>Week 11 (April 22, 24) Stakeholders: Tribes, National Historic Preservation Act, Tribal Consultations</p>	<p>Archaeological & Cultural Impacts, National Historic Preservation Act Tribal Consultations Marine Archaeology</p> <p>Guest Speaker TBA</p>
<p>Week 12 (April 29, May 1) Stakeholders: Navigation & Safety of Ocean and Airspace - Military, Army Corps of Engineers, FAA, Coast Guard</p>	<p>Permits related to human uses of the ocean and airspace: FAA, Military Vessel Navigation Routes Aviation and Radar Assets Department of Defense (DOD) Review Process</p> <p>Final Project Assigned</p> <p>Guest Speaker TBA</p>
<p>Week 13 (May 6, 8) Finals Week</p>	<p>Final Project Due Sunday, May 19 at Midnight EST</p> <p>Course Evaluations End-of-Semester Networking Activity</p>

Note: Class schedule may change; refer to the course Canvas weekly for updates.

Course Policy and Requirements:

This course will be taught synchronously and asynchronously. Attendance at the weekly lecture is highly encouraged to be successful in the course. All weekly lectures will be recorded for students with a time conflict during the synchronous time.

Grading Scale and Criteria:

Individual grades for the course will be based on the following scales:

Graduate Grading Scale (ECO 611):

A 93-100% B- 80-82%

A- 90-92% C+ 77-79%

B+ 87-89% C 73-76%

B 83-86% F Per policy of the Graduate School, grades below a C will result in a failing grade

The weights of course assignments and activities are as follows:

25% Midterm Project

25% Final Project

50% Homework, Group Projects, Presentations

Academic Honesty Policy Statement:

The integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, and academic honesty is required of all students at the University of Massachusetts. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair.

For more information about what constitutes academic dishonesty, please see

<https://www.umass.edu/honesty/>

The procedures outlined at the website listed above are intended to provide an efficient and orderly process by which action may be taken if it appears that academic dishonesty has occurred and by which students may appeal such actions. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent.

Accommodations:

The University of Massachusetts is committed to making reasonable, effective and appropriate accommodations to meet the needs of students with disabilities and help create a barrier-free campus. If you are in need of accommodation for a documented disability, register with Disability Services to have an accommodation letter sent to your faculty. It is your responsibility to initiate these services and to communicate with faculty ahead of time to manage accommodations in a timely manner. For more information, consult the Disability Services website at

<http://www.umass.edu/disability/>

Communicate Often!

If any unexpected situations arise during the semester which might affect your scholastic schedule or otherwise have an impact on your ability to complete the coursework, please don't hesitate to contact the instructor.