

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

Spring 2021 Instructor: Max Dilthey (mdilthey@umass.edu), Dwayne Breger (dbreger@umass.edu)

Meeting Place/Time: Wednesday 6:00-7:00pm EST

Course Description:

Before construction begins on an offshore wind farm, there is a rigorous process of assessing ecological and human impacts, obtaining federal and state permits, and engaging with stakeholders. This process is expensive, lengthy, and vital to the successful installation of an offshore wind farm. A thorough understanding of these procedures is essential to all professionals in the offshore wind industry. This course is designed to guide the student through this process, from the time the potential offshore wind development site has been identified, until construction is complete and the wind farm is operational.

Learning Objectives:

Upon successful completion of this course, students will understand:

- Ocean and benthic environment and ecology
- Threatened/endangered/commercial species of concern
- Pre-and post-construction monitoring
- Impacts of offshore wind construction and operation
- Impact mitigation
- Federal and State ocean jurisdictions
- BOEM – leasing and auctioning for offshore wind development rights; environmental and other permits under NEPA and other laws
- Permitting of subsurface cables, landfall, and interconnection
- 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 Moodle. You should come to class having completed the assigned readings, so that we can apply the course material.

Course Outline:

<p>Week 1: Introduction to Wind Energy</p>	<p>Course Introduction Offshore Wind Scale & Potential Wind Energy Basics Wind Turbines, Arrays, Cables: from Land to Sea</p>
<p>Week 2: BOEM & the Permitting Process</p>	<p>Timeline: Offshore Wind Leasing Process - Planning, Leasing, Permitting, Construction & Operations, Decommissioning Regulation of Offshore Wind: Agencies, Authorities National Environmental Policy Act (NEPA); role of NEPA in environmental permitting for offshore wind Offshore Substructure Presentations</p>
<p>Week 3: BOEM, Leasing, Site Assessment, Construction and Operations Plan (COP), Section 585 Regulations</p>	<p>Federal Process: Site Assessment Plans (SAP); Construction and Operations Plan (COP) 30 CFR 585 regulations State Process: Coastal Zone Management Act</p>
<p>Week 4: 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: 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>Week 6: 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>Week 7: Fish: Species Distributions, Impacts from</p>	<p>Benthic & Pelagic Fish, Essential Fish Habitat Major protections including Magnuson Steven Act, Fish & Wildlife Coordination Act</p>

Wind, Mitigation Measures	Fish: impacts from offshore wind: Surveys, Construction, Operations & Maintenance Surveying, Monitoring, Mitigation
Week 8: Bringing Offshore Energy Home	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
Week 9: Theory of Social Acceptance; Best Practices for Stakeholder Engagement	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 process. Baseline surveys, public opinion Case Studies - Cape Wind, Block Island
Week 10: Stakeholders: Commercial & Recreational Fishers, Economic Value, Recreation & Tourism	Fisheries: Resolving Spatial Conflicts; Commercial and Recreational Fisheries, economic value Tourism & Recreation
Week 11: Stakeholders: Tribes, National Historic Preservation Act, Tribal Consultations	Archaeological & cultural impacts, National Historic Preservation Act Tribal Consultations
Week 12: Stakeholders: Navigation & Safety of Ocean and Airspace - Military, Army Corps of Engineers, FAA, Coast Guard	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

Week 13: Finals	Final Preparation Course Evaluations
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Note: Class schedule may change; see Moodle for current course topics, readings, and assignments.

Course Policy and Requirements:

This course will be taught asynchronously. Attendance at the weekly lecture is highly encouraged. All weekly lectures will be recorded for students with a time conflict during the synchronous time. While in-person attendance is encouraged, you will be able to complete all course materials on your own schedule if necessary and your grade will not be affected by absences.

Assignments will not be accepted late without express advance permission from the instructor, and may be subject to a grade penalty.

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/>

COVID-19 Pandemic Response:

We understand that these are trying times that present new challenges to our work and educational lives. If you require any accommodations to assist with those circumstances, or 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.