

Summer 2023 Syllabus

ECO 612: Offshore Wind Energy – Project Economics, Deployment, and Business Logistics

Summer 2023 Course Administrator: Max Dilthey (mdilthey@umass.edu)

Synchronous Lectures 2x Weekly: Mondays and Wednesdays 6:00-7:00pm EST (except on holiday weeks)

Office Hours: Tuesdays 6:00-7:00pm EST (except on holiday weeks) or by appointment with Max

Construction of an offshore wind farm requires the coordination of significant financing, complex project management, a well-established and partially local workforce, a robust domestic and international supply chain, a coordinated offtake for the electricity produced, and other essential infrastructure investments. Wind industry professionals must understand this deeply complex process to make informed decisions for the planning and construction of offshore wind projects. This course will introduce the critical logistics of getting an offshore wind farm up and running, from the planning stages until construction is complete and the wind farm is operational.

This on-line course will consist of recorded lectures with slides, assigned readings, hands-on assignments, and two projects. Students will engage with the course administrator, guest instructors, guest speakers, and fellow students through robust on-line discussion sessions.

Learning Objectives:

Upon successful completion of this course, students will understand:

- Capital cost, levelized cost of energy, and revenue cash flows of OSW projects
- Financial structures for project development, construction, operations
- Financial risks and mitigation: insurance, long term contracts, energy market hedges
- Federal and state policy incentives and ISO-NE market structures for offshore wind
- Offshore wind supply chain: current status and emerging needs;
- Workforce needs: number and description of jobs;
- Safety and training requirements and standards, and educational programs
- Supply chain coordination and build up
- The Jones Act
- Global perspectives and construction and operational experience
- Project and construction management
- Port-side fabrication of offshore wind subsystems
- Port deployment and construction procedures
- Cable-laying, substations, subfloor transmission, interconnection
- Project commissioning; and operations and maintenance

Holiday Note: To accommodate our guest speakers, the holiday schedule will be as follows:

- Monday, May 30th (Memorial Day): Class will be held normally.
- Monday, June 20th (Juneteenth): No Class — Class held on Tuesday, June 21

Course Outline:

Week	Topics	Guest Instructor
Introduction to Offshore Wind Business Models, Port Logistics and Port Development		

<p>Week 1 (Tues, May 30, Wed, May 31)</p>	<p>NOTE: Class on Tuesday and Wednesday (Memorial Day Schedule)</p> <p>Intro Class: Introduction to Offshore Wind Farm Design and Planning</p> <p>Overview of Offshore Wind Developers Business and Financing Structure</p>	<p>Max Dilthey Nick Zenkin, Xodus Group,</p>
<p>Week 2 (Mon, June 5, Wed, June 7)</p> <p>Office Hours: (Tues, June 6)</p>	<p>Domestic supply chain development Workforce and supply chain modeling Roles and jobs in Offshore Wind Certifications and Training</p>	<p>Nick Zenkin, Xodus Group</p>
	<p>Port infrastructure development System assembly/staging at port Turbine, tower, foundation deployment</p>	<p>Rob Holmlund, Director of Development, Humboldt Bay Harbor District</p>
<p>OSW Economics, Policy, Electric Markets, and Project Finance</p>		
<p>Week 3 (Mon, June 12, Wed, June 14)</p> <p>Office Hours: (Tues, June 13)</p>	<p>Offshore wind system costs, interconnection configurations, costs and implications; energy generation and prices, levelized cost of energy (LCOE) analysis; federal/state incentive programs</p> <p>State goals, procurement and long-term contract & OREC policies and processes. Competitive dynamics between states, lease areas</p>	<p>Bob Grace, Sustainable Energy Advantage LLC</p>
<p>Week 4 (Tues, June 20, Wed, June 21)</p>	<p>NOTE: Class on Tuesday and Wednesday (Juneteenth Schedule) ISO New England (deregulated) electricity markets, interconnection process</p>	<p>John Keene, Sustainable Energy Advantage LLC</p>
	<p>BOEM leasing process and agreements Offshore wind financing structures Financial risks/mitigation Insurance</p>	<p>Jordan Shoesmith, Vineyard Offshore and Copenhagen Offshore Partners</p>
<p>Floating Wind, Stakeholder Engagement, and Diversity, Equity, and Inclusion in Renewable Energy</p>		
<p>Week 5 (Mon, June 26, Wed, June 28)</p> <p>Office Hours:</p>	<p>Operations and maintenance Operations logistics US and UK offshore wind markets Global supply chain development</p>	<p>Andy Logan and Lara Jurgens, Xodus Group</p>

(Tues, June 27)	Floating Wind in California Domestic supply chain development	Matt Shields, National Renewable Energy Laboratory
Week 6 (Wed, July 5) Office Hours: (Tues, July 4)	Opportunities and Challenges in OSW Workforce Development Commitments and goals within the industry Democratization of OSW benefits	Panel Discussion: Kerry Bowie, Browning the Greenspace, Xodus Group

Course Policy and Requirements:

This course will be taught 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. You will be able to complete all course materials on your own schedule if necessary and your grade will not be affected by absences.

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% Assignment 1

25% Assignment 2

25% Final Project

25% Other Homework Assignments and Forum Posts

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

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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/>

We understand that life circumstances can present new or unexpected 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.