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

Summer 2024 Course Administrator: Max Dilthey (mdilthey@umass.edu)

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

Office Hours: Most 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 small 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
- 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

(Course Schedule on next page)

Course Schedule

Lecture Dates	Topics	Guest Instructor
Introduction to Offshore Wind Developers and the US Market		
Week 1 (Wed, May 22)	**NOTE:** No Monday class next week (Memorial Day Schedule) Intro Class: Introduction to Offshore Wind and Summer Course Logistics	Max Dilthey, Xodus Group
Week 2 (Wed, May 29) **Office Hours:** (Tuesday, May 28)	Overview of Offshore Wind Developers Business and Financing Structure	Nick Zenkin, Xodus Group
Week 3 (Mon, June 3, Wed, June 5) **Office Hours:** (Tues, June)	Domestic supply chain development Workforce and supply chain modeling Roles and jobs in Offshore Wind Certifications and Training	Nick Zenkin, Xodus Group
	Port infrastructure development System assembly/staging at port Turbine, tower, foundation deployment	Rob Holmlund, Director of Development, Humboldt Bay Harbor District
OSW Economics, Policy, Electric Markets, and Project Finance		
Week 4 (Mon, June 10, Wed, June 12) **Office Hours:** (Tues, June 11)	Offshore wind system costs, interconnection configurations, costs and implications; energy generation and prices, levelized cost of energy (LCOE) analysis; federal/state incentive programs State goals, procurement and long-term contract & OREC policies and processes. Competitive dynamics between states, lease areas	Bob Grace, Sustainable Energy Advantage LLC
Week 5 (Mon, June 17, Tues, June 18)	**NOTE:** Class on Monday and Tuesday (Juneteenth Schedule) ISO New England (deregulated) electricity markets, interconnection process	John Keene, Sustainable Energy Advantage LLC

	Overview of Global OSW Supply Chain Development Comparison of US and UK offshore wind markets Lessons Learned from the UK	Andy Logan, Xodus Group
Floating Wind, Stakeholder Engagement, and Diversity, Equity, and Inclusion in Renewable Energy		
Week 6 (Mon, June 24, Wed, June 26) **Office Hours:** (Tues, June 25)	Community benefits agreements Workforce development Labor Unions Local content requirements and opportunities	Erik Antokal, Workforce Development Director, Labor Relations, Ørsted
	Floating Wind in California Domestic supply chain development	Matt Shields, Senior Offshore Wind Analyst, National Renewable Energy Laboratory
Week 7 (Mon, July 1) **Office Hours:** (Tues, July 2)	Opportunities and Challenges in OSW Workforce Development Commitments and goals within the industry Democratization of OSW benefits	Nyssa-Dawn Corria, Project Controls Manager, Avangrid Renewables Kerry Bowie, Board President, Browning the Greenspace Managing Director & Founder, Msaada Partners

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 612):
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 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.