**Offshore Renewable Energy**

**MARSCI323A/ENV723A**

# Instructor: Dr. Douglas Nowacek

**Teaching assistant: Brittney Mitchell**

Duke University Marine Laboratory, Fall 2024

**LEARNING OBJECTIVES**

By the end of this course you will:

* Gain exposure to the full suite of offshore renewable energy in use and under development worldwide.
* Evaluate the tradeoffs associated with development of offshore renewable energy, including contrasts with traditional energy sources, e.g., offshore oil/gas
* Assess the potential impacts (positive and negative) of offshore renewable energy on offshore wildlife
* Critically evaluate environmental impact statements, permitting applications, government agency guidelines pertinent to offshore renewable energy development.

**Course design***:*

Offshore renewable energy development requires unique considerations as an oceanic venture. Offshore renewable energy (wind and hydrokinetic) operation requires unique strategic preparation and considerations. The course will take a holistic approach to evaluating offshore renewable energy development: benefits and challenges of traditional vs. renewable offshore energy including concerns for wildlife (ocean noise generated by industrial activity, ship strikes, and a range of potential habitat changes); development of environmental impact statements; permitting processes; consultations with industry, government and other stakeholders; and legal implications; introduction to the economics of offshore energy as it compares to traditional energy sources and onshore renewables; indigenous and environmental justice concerns.

Our typical schedule will be to have a guest speaker or me give a lecture on Monday, and then on Wednesdays we will ‘workshop’ that information, i.e. we will spend class time discussing the presentations and the readings. I have tried to organize our visitors and lectures to parallel the process you will need to follow to plan your offshore renewable power generating facilities. You/your group will each be responsible for preparing brief presentations and leading a discussion based on your topic, materials, and related papers/resources that you will select with assistance from the instructor and TA. Selected materials will be distributed to the class via Canvas prior to each discussion. Leading and preparing for your discussions will serve as a primary evaluation, along with the final power plant plan. You are expected to read and prepare not only for your presentation but also the papers chosen for the class by other groups/presenters. Your presentation will include additional materials that will embellish discussion. When it is not your turn to lead the discussion, you are expected to be very familiar with the papers/materials being discussed, e.g., come with questions/discussion points/critique prepared. Presentations and subsequent discussions will take place throughout the course.

**GRADING** **AND EXAMINATIONS**:

There will be the following assignments. You will be expected to complete all reading assignments BEFORE class and participate fully in all lecture discussions. Details on all other assignments will be provided in separate handouts.

Assignments:

1. Individual/group presentations during our ‘workshops’ following guest speakers/readings: these are the facts as we know them currently for the individual topics, e.g., what do we know about the collision risk for birds, based on terrestrial data? European data? Also, where do we go from here, e.g., do we know enough to proceed with regulations? What research do we still need?
2. Panel and stakeholder discussion participation: we will be visited by several folks in the offshore renewables business\*, and they will provide readings/materials for you to review prior to their presentations. You will be responsible for submitting a question for each presenter, and we will get to as many of those as possible.
3. Offshore power generating facility plan

Students will be evaluated as follows:

* + - Individual/group presentations (30%) – divided equally among: i) background/introduction; ii) review, analysis, and critique of your materials; iii) discussion/engagement; and v) participation in other presentations
		- Preparation for and participation in discussions and panels (20%)
		- Offshore power generating facility plan (50%)

**Text:**

I will assign and make available relevant sections/chapters of new texts that are available, and we will rely heavily on primary literature, government documents, industry materials, etc.

**Class preparation, instructor and student responsibilities:**

If you don't understand the material please seek help from an instructor or one of the other students in the class. You are the one ultimately responsible for your successful progress in this class.

**Contact INFORMATION:**

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To uphold the Duke Community Standard:

I will not lie, cheat, or steal in my academic endeavors;

I will conduct myself honorably in all my endeavors; and

I will act if the Standard is compromised.

\*by ‘business’ I mean not just the industry but all components of offshore renewables, e.g., government regulators, eNGOs, researchers, etc.