1. Course Description and Prerequisites
A hands-on course designed to introduce the field of Ocean Engineering as applied specifically to renewable energy systems. Course topics include: forces and moments, basic electric circuits, DC motors, gears, computer programming, engineering design, basic computer tools, basic engineering measurements and analysis, technical report writing, oral presentation, and professional ethics. To strengthen the learning process, students will apply these concepts to the design, building and testing of an in-stream hydrokinetic energy systems. The instructor reserves the right to change the scope of the project if needed.

2. Course Objectives (what we will do in this class)
This course is aimed at exposing students with an opportunity to solve an engineering problem. The problem involves how to do research, how to work in a team environment, and how to design and analyze the system performance.

3. Course Outcomes (what we expect you to learn)
This course is focused more on what students can apply their knowledge to solve an engineering problem. After completing the course, students will have developed the ability:
1. To apply basic knowledge of math and science to an engineering project
2. To design a system, component or process to meet desired needs
3. To communicate effectively
4. To function in a team environment
5. To conduct simple experiments and analyze data

4. Text Book (if required)
None

5. Resources (needed/ to be provided)
None

6. Grading Scheme
   Class Performance (15%)
   - 10% Attendance
   - 5% Participation
Homework and Exams (30%)
- 15% Homework
- 15% Final Exam (July 1)

Engineering Design & Technical Communication (55%)
- 5% Preliminary Design Review Presentation (June 22)
- 10% Final Design Review Presentation (June 24)
- 25% Group Project Final Report (July 1)
- 15% Group Project Power-point Presentation (July 1)

7. Grading Scale

The following grading scale will be adopted for this class, and students are explicitly warned that there is no curving in grades. They are expected to monitor their class performances and determine whether the results meet their expectations. When the overall score of a student is at the borderline between grades, the instructor has the discretion to decide a grade based on the student’s performance and participation level shown in the class.

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>≥ 90</td>
<td>A</td>
</tr>
<tr>
<td>86.7 – 90.0</td>
<td>A−</td>
</tr>
<tr>
<td>83.3 – 86.7</td>
<td>B+</td>
</tr>
<tr>
<td>80.0 – 83.3</td>
<td>B</td>
</tr>
<tr>
<td>76.7 – 80.0</td>
<td>B−</td>
</tr>
<tr>
<td>73.3 – 76.7</td>
<td>C+</td>
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<tr>
<td>70.0 – 73.3</td>
<td>C</td>
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<td>56.7 – 60.0</td>
<td>D−</td>
</tr>
<tr>
<td>&lt; 56.7</td>
<td>F</td>
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</tbody>
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8. Course Schedule Details
TBA

9. Submission and Lab Usage Requirements
TBA

10. Instructor and Contact Information
Instructor: Dr. James VanZwieten 561-297-0955 jvanzwi@fau.edu
Mentor: Muangthai Prachankhet (Par) 321-537-1722 mprachan@my.fau.edu

11. Class Dates, Time and Location
Location: EG36 Rm. 162 (Lab in Rm. 157)
Dates and time: M,W,F from June 13-July 1 9:30am-12:30pm & 1:30pm-4:30pm (6 hours)

12. General Classroom policies
Professional behavior is expected in the classroom. The use of cellular phones, pagers, or other personal communications devices while class is in progress, or during tests, will not be tolerated. If you must have them, please turn audible ringers off and take conversations outside of class. The class is asked to respect the rights of other students and the instructor and to avoid conversations and disturbances during class.

Attendance is required for all classes. Any student who misses one class without prior approval will automatically receive 0% in attendance. Any student who misses more than one class will automatically receive an F in the final grade. (Exceptions to these policies include medical / family emergencies, in which case a doctor’s letter or the instructor’s approval is required).

Plagiarism is a serious offense. Plagiarism involves stealing or passing off someone’s ideas, words, text, arts, figures, tables, homework assignments, and engineering designs as your own without crediting the source (extracted from Merriam Webster Online Dictionary). Note that the copied material can be as short as a sentence or a paragraph. If you are caught with plagiarizing someone’s materials, you will automatically receive an F in the final grade with no questions asked. You are strongly warned that there is a zero-tolerance policy on plagiarism.

13. Assignment Submission Guideline
All assignments must be submitted electronically to the FAU Blackboard SafeAssign website (https://blackboard.fau.edu), unless otherwise stated. You are required to use your FAU account (with your assigned user name and password). The assignments include homework, project reports and power point presentation. All submissions will be checked for plagiarism. You are strongly discouraged to plagiarize, as you will most likely be caught if you do so.

Homework assignments must be typed on a computer. Text, mathematical formulas, equations, figures and diagrams, or any scanned materials in all your assignments must be clearly presented. Late assignments will not be accepted without prior approval, and will receive zero points.

14. Project Guideline
You must consider safety the HIGHEST priority when you work on any of the hands-on exercises. You MUST adhere to the safety precautions provided by the instructor as to how to handle mechanical and electrical parts, tools and equipment required for the project. In particular, you may not remove any or tools off campus, unless approved by the instructor. You need to report any damage of any parts or tools immediately to the
instructor. Any student who intentionally damages or endangers other students will automatically receive an F in the final grade.

15. Team Guideline
You will be divided into teams on the first day. Once every team is formed, you will work together for the entire course period. When working on the class project, each team must consist of the following members: project manager, design engineer, manufacturing engineer, and testing engineer. If there are more than four members in a team, any additional member will become a design engineer. Each team is required to turn in its list of team member’s names and their corresponding roles by the end of the first week of class. As part of the project’s grade, each team member will be judged based on how well he / she performs the assigned tasks and communicates with other members in the group:

- **Project Manager:**
  o Deal with the big picture and gets the project completed successfully (monitor project progress, anticipate unexpected delay, and revise plan accordingly)
  o Listen to other engineers’ inputs and deals with them objectively (don’t bias toward some members because they are your buddies or you don’t like them)
  o Facilitate discussions, disagreements, and compromise among engineers. If there are unresolved issues, the project manager must report them to the instructor
  o Provide resources to the engineers so that they are not idling or stuck
  o Participate in design, manufacturing, and testing tasks

- **Design Engineer:**
  o Consider and record all the designs provided by each and every team member
  o Select and record the design weighting factors according to the team members’ inputs
  o Evaluate the designs based on the criteria and weighting factors
  o Select and record the final design by choosing the one with the maximum evaluation score
  o Lead the final design in Design Review. The final design must have detailed information (dimensions, weight, location of payload, materials, etc) so that the manufacturing engineer can actually build it!
  o Receive comments during Design Review, and modify the final design if needed

- **Manufacturing Engineer:**
  o Identify what tools are needed and learn how to use them (make sure that you adhere to the safety rules and regulation provided by the instructor)
  o Study the design plan and make sure that it has all of the required information required for the assembly plan (talk to the design engineer if there is any confusion)
  o Plan out the assembly process (what should be done first, what afterward, etc)
- Present the assembly plan to the team and receive their feedback
- Record the assembly plan and discuss about methods, problems, challenges
- Work with the testing engineer to determine if partial testing can be done in parallel to construction

**Testing Engineer:**
- Identify what tools are needed for testing, and learn how to use them (make sure that you adhere to the safety rules and regulation provided by the instructor)
- Work with the manufacturing engineer to determine if the product matches the design specification
- Carefully study the design criteria and the operating environment, and design a test plan for the product (a thorough test plan can test all the functionality of the product, or a bad test plan might unintentionally approves a bad product)
- Present the test plan to the team, and receive their feedback
- Record the test plan, and discuss the planned methods, results, conclusions
- Carry out the testing and record visual measurements. Other team members might need to help carry out the test.
- Work with the design and manufacturing engineers if the product fails, and re-design and re-build might be need