

OCEN 485/685: Engineering With Nature  
Course Outline  
Spring Semester 2018

**Instructor:** Orencio Duran Vinent, PhD  
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**Class** Monday 12:40–13:30  
**Schedule:** HEB 103 / P MEC 144

**Office Hours:** To be proposed

**Prerequisites:** **685:** Enrollment in a graduate program in one of the following majors: Ocean Engineering, Civil Engineering, Marine Biology, Oceanography, Marine Sciences  
**485:** Enrollment with U3 or U4 status in the Undergraduate program in Ocean Engineering or Offshore and Coastal Systems Engineering

**Course** **685 Directed Studies:** Special topics not within scope of thesis research and  
**Description:** not covered by other formal courses.  
**485 Directed Studies:** Special problems in various areas of ocean engineering assigned to individual students or to groups; readings and assignments given and frequent consultations held.

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 Spring Semester 2018

**Sample  
 Lecture  
 Topics:**

Week	Subjects
1	Overview; Introduction; Motivation
2	Relevant coastal features and physical processes shaping their morphology
3	Effects of biology in coastal environments
4	Interactions between physical processes and biology in the formation of nature-based features
5	Human Effects: Interaction between nature-based features and the built environment
6	Specific Application of Engineering with Nature 1
7	Specific Application of Engineering with Nature 2
8	Specific Application of Engineering with Nature 3
9	Specific Application of Engineering with Nature 4
10	Specific Application of Engineering with Nature 5
11	Specific Application of Engineering with Nature 6
12	Specific Application of Engineering with Nature 7
13	Socio-Political Aspects of Engineering with Nature
14	Wrap-Up and Overall Observations

**Homework:**

The main difference between the 485 and 685 courses is the homework assignments. Homework assigned to undergraduates will generally be qualitative and descriptive in nature. Homework assigned to graduate students will include both qualitative and quantitative components. Homework will be accepted after the due date only if the student has made prior arrangement with the instructor for the late submission, or in the event of a University Excused Absence. Students are welcome to discuss the broad class topics related to their homework assignments but all submissions are expected to be the independent work of the student.

**Grading:**

Homework: 100%

**Attendance:** Overall course letter grades will be lowered one letter grade for every two unexcused absences. Students registered for the class on either the College Station or Galveston campus and not paying the remote education course fee must attend class in one of the two assigned classrooms at the time the class is being given live.

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<b>Grading Scale:</b>	90%	≤	A		
	75%	≤	B	<	90%
	65%	≤	C	<	75%
	50%	≤	D	<	65%
			F	<	50%

The grading scale may be made less strict at the instructor's sole discretion.

**Academic Integrity Statement and Policy:**

Aggie Honor Code: "An Aggie does not lie, cheat, or steal or tolerate those who do." Upon accepting admission to Texas A&M University at Galveston, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMUG community from the requirements or the processes of the TAMUG Honor System. For additional information: <http://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules>

**Absences:**

Student attendance and participation in class is fundamental to the overall success of the learning experience. Attendance will be taken at every class meeting on each campus. Late arrivals count as absences. Overall course letter grades will be lowered one letter grade for every two unexcused absences. Students registered for the class on either the College Station or Galveston campus and not paying the remote education course fee must attend class in one of the two assigned classrooms at the time the class is being given live. Assignments may only be made up for excused absences. Students should make arrangements with the course instructor to make up any missed work prior to an excused absence.

University rules specify that excused absences for all exams must be documented. It is the student's responsibility to contact the instructor within three working days following the absence date for make up requirements of exams. Further information concerning absences can be found in the University Students Rules Section 7: <http://student-rules.tamu.edu/rule07> . For a University excused absence, the student should contact the Counselling Office to request a letter for the instructor stating that the student's absence may be considered as excused by the course instructor. Please consult the University Student rules for reasons for excused absences, detailed procedures and deadlines.

If the absence is excused in the process as outlined in the university Student Rules, the student must be given the opportunity to make up the work. The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unauthorized absence. See Part III, Student Grievance Procedures, Section 49, Unexcused Absences, for more information on appealing an instructor's decision.

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Course Outline  
Spring Semester 2018

**American  
Disabilities  
Act:**

Policy Statement The Americans with Disabilities Act (ADA) is a federal non-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this law requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. For additional information visit <http://catalog.tamu.edu/undergraduate/university-policies>

**Family  
Educational  
and Rights to  
Privacy Act  
(FERPA):**

FERPA is a federal law designed to protect the privacy of educational records, to establish the right of students to inspect and review their educational records and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings. To obtain a listing of directory information or to place a hold on any or all of this information, please consult Admissions & Records Office.

Items that can never be identified as public information are a student's social security number or institutional identification number, citizenship, gender, grades, GPR or class schedule. All efforts will be made in this class to protect your confidentiality.

**Learning  
Outcomes:**

The intent is that by the end of the course, students will be able to: [letters refer to the EC-2000 Criteria 3, below]

- Explain various features and interactions relevant to engineering with nature in written form [g,h,j,6]
- Apply their background knowledge of concepts fundamental to engineering with nature to develop and describe independent views on important nature-based features within the modern socio-economic climate [f,g,h,i,j,6]

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**EC-2000  
(Criteria 3)**

**Engineering programs must demonstrate that their graduates have:**

- a. an ability to apply knowledge of mathematics, science, and engineering;
- b. an ability to design and conduct experiments as well as to analyze and interpret data;
- c. an ability to design a system, component, or process to meet desired needs;
- d. an ability to function on multidisciplinary teams;
- e. an ability to identify, formulate, and solve engineering problems;
- f. an understanding of professional and ethical responsibility;
- g. an ability to communicate effectively;
- h. the broad education necessary to understand the impact of engineering solutions in a global/societal context;
- i. a recognition of the need for and an ability to engage in lifelong learning;
- j. a knowledge of contemporary issues; and
- k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**Ocean  
Program  
(Criteria 9)**

**“Ocean” and similarly named engineering programs must demonstrate that their graduates have knowledge of:**

1. Fluid Mechanics
2. Solid Mechanics
3. Dynamics
4. Hydrostatics
5. Probability & Applied Statistics
6. Oceanography
7. Water Waves
8. Underwater Acoustics
9. Ability to Work in groups to perform Engineering Design