

MASE 406 - Capstone Design I Course Outline Fall 2015

- Instructors:**
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| Juan J. Horrillo, PhD
Assistant Professor, MASE
Office: P MEC, Room 217
Phone: (409)740-4465
e-mail: horrillj@tamug.edu | Rick Fielder,
Lecturer, MASE
Office: P MEC
Phone: (832)419-0847
e-mail: fielderr@tamug.edu |
| Jens Figlus, PhD
Assistant Professor, MASE
Office: P MEC, Room 218
Phone: (409)741-4317
e-mail: figlusj@tamug.edu | Masoud Hayatdavoodi, PhD
Instructional Assistant Professor, MASE
Office: P MEC, 117
Phone: (409)740-4486
e-mail: hayatdam@tamug.edu |
- Class Schedule:** Regular class meetings of a lecture format will be held for one hour each week. In addition, the course requires regularly schedule weekly meetings between students and their advisor.
- Monday P MEC 144 9:00–9:50 am
- Lab Schedule:** The “Special Projects” room will be available for the use by this class for the duration of the semester.
- Office Hours:** Regular weekly meetings between the advisor and project team will be arranged by mutual agreement
- Prerequisites:** Students must have successfully completed all required 300-level engineering and technology courses. Prior completion or co-enrollment in: MASE 463, MASE 415 and MASE 405. Successfully completion of ENGL 210. Enrollment in OSCE major degree sequence.
- Textbooks:** *Elements of Style*, Strunk and White (and others depending on edition), any edition newer than the Third (Fourth or newer).
- Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects and Builders*, Version 2.1, Chris Hendrickson, Available without charge from <http://www.ce.cmu.edu/pmbook/>. First Edition originally printed by Prentice Hall, ISBN 0-13-731266-0, 1989 with co-author Tung Au.
- Recommended:** *Marine Engineering Economics and Cost Analysis*, E.C. Hunt and B. Butman, Cornell Maritime Press, 1994, ISBN 0-87033-458-1

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Course Description: Part one of a two-course sequence: Development and presentation of detailed proposals for offshore or coastal engineering projects, which will form the basis for Capstone II design projects. Topics include: Formulation of project objectives, design constraints, delineation of alternatives, scheduling, and analysis of economic and environmental impact. This is a writing-intensive course including a major report and weekly one-page written reports.

Computer Usage: Computer literacy is mandatory for this class. Students are expected to utilize the best tools available, which will involve self-teaching of one or more commercial computer programs.

Professional Behavior: The two-course sequence is intended to help the students transition from the role of a student to the role of a practicing engineer. As such, students are expected to demonstrate a level of professionalism expected of junior engineers.

In group-meetings, students are assigned the role of an engineering contractor, while the professor acts in the role of a client. Students are expected to appear on time and well-organized for group-meetings with their instructor. Written documents are expected to be well-written and oral presentations are to be made in a professional manner.

Grading: Course grades reflect both performance of the group and performance of the individual. Final and intermediate deadlines are of primary importance. Not all members of a group will necessarily get the same course grade, and particularly poor or exceptionally good individual performance can lower or raise the group score. All components of the course must be completed to receive a passing grade.

Weekly Progress Reports and Presentations	10%
Mid-Semester Report	20%
Mid-Semester Presentation	15%
Draft Proposal	15%
Final Proposal	20%
Final Presentation	20%
Total:	100%

The grading scale is defined as:

90 – 100% =	A,
80 – 89% =	B,
70 – 79% =	C,
60 – 69% =	D,
< 60% =	F

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Weekly Schedule:	Week	Lecture Topic
	1	Introduction, Orientation and Project Selection Guidelines
	2	Project Justification I
	3	Project Justification II
	4	Project Justification III -by Examples (Economic Analysis)
	5	Project Report and Presentations - Comparison of Options, Part I
	6	Project Report and Presentations - Comparison of Options, Part II
	7	Midterm Student Presentations
	8	Scheduling I: Purpose, overview, Gantt charts
	9	Scheduling II: CPM and PERT
	10	Scheduling III and Project Controls
	11	Life of a Project
	12	Project Reporting, Documentation and Presentations I
	13	Project Reporting, Documentation and Presentations II
	14	Final Student Presentations

Weekly Schedule (continuation): This is predominately a project and lab class; instructional and lecture topics on weekly schedule will vary according to student project specifics. Few presentations from the industry (if it is required) are planned to guide/help students through their projects.

Absences: Attendance will be recorded most class sessions. Unexcused absences in three classes (here, this includes weekly meetings) will result in a letter reduction of the student's final course grade. Severe attendance problems may result in a failing grade in the class.

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. Information concerning absences is contained in the University Student Rules Section 7 <http://www.tamug.edu/stulife/Academic%20Rules/Rule%207.pdf>. The University views class attendance as an individual student responsibility. All students are expected to attend class and to complete all assignments. Please consult the University Student Rules for reasons for excused absences, detailed procedures and deadlines as well as student grievance procedures (Part III, Section 45).

Academic Integrity Statement: AGGIE HONOR CODE: "An Aggie does not lie, cheat, or steal or tolerate those who do". Upon accepting admission to Texas A&M University, 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 TAMU community from the requirements or the processes of the Honor System. Procedures can be found on the web: <http://www.tamug.edu/HonorSystem>

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**Americans
with
Disabilities
Act:**

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. If you believe you have a disability requiring an accommodation, please contact the Counseling Office, Seibel Student Center, or call (409)740-4587. For additional information visit <http://www.tamug.edu/counsel/services/dssprocedures.htm>

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

FERPA is a federal law designed to protect the privacy of educational records by limiting access to these 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 the 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 privacy and to ensure confidential treatment of information associated with or generated by your participation in the class.

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**Learning
Outcomes:**

The primary goal of the course is to provide students with the experience of executing a realistic and relatively comprehensive design project which requires use of much of the engineering knowledge they have acquired throughout their engineering education. To meet this objective, students will also be introduced to additional engineering and project management methods and considerations relevant to engineering design. (Letters correspond to EC-2000 Criteria 3, below)

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Objective		Implem.	Assessment Tools	EC-2000 (Criteria 3) Outcomes										
				a	b	c	d	e	f	g	h	i	j	k
Obj#1	Prepare students to assemble a realistic and relatively comprehensive design plan for an ocean engineering project	Lecture, teamwork	Weekly meeting presentation, meeting report	x			x		x	x	x	x	x	x
Obj#2	Prepare students to produce teamwork ocean engineering design planning	Lecture, weekly meeting	Weekly meeting presentation, meeting report	x		x	x	x	x	x				
Obj#3	Create a framework with various course materials that can be integrated to consolidate students' knowledge	Project execution	Midterm and final presentations	x		x	x	x			x	x		x
Obj#4	Have students prepare and present a detailed engineering technical proposal	Team project execution, meeting	Draft and final report				x			x				x
Obj#5	Prepare students to develop engineering project schedule	Lecture, meeting	Weekly meeting presentation, meeting report					x		x				x
Obj#6	Prepare students to develop engineering project economics and project life-cycle	Lecture, meeting	Draft and final report, Midterm presentation	x			x	x			x			x
Obj#7	Prepare students to analyze project environmental impact	Team project execution, meeting	Weekly meeting presentation, final report	x	x				x	x	x			x

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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.