TEXAS A&M UNIVERSITY.

OCEN 300 - OCEAN ENGINEERING WAVE MECHANICS   *COURSE SYLLABUS*

COURSE INFORMATION	**Ocean Engineering Wave Mechanics - OCEN 300** **Spring 2016**

COURSE INSTRUCTOR

Masoud Hayatdavoodi, Ph.D.
Instructional Assistant Professor
Department of Ocean Engineering

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CLASS SCHEDULE
- **Lecture:** Monday, Wednesday, Friday 02:00PM - 02:50PM at PMEC 146

OFFICE HOURS

Monday:	03:00PM-04:00PM,
Wednesday:	03:00PM-04:00PM,
Friday:	03:00PM-04:00PM.

And by appointments.

GRADING

Assignments	20%
Project	20%
Midterm Exam	30%
Final Exam	30%

GRADING SCALE

A	$\geq 90\%$
B	$\geq 75\%$
C	$\geq 60\%$
D	$\geq 50\%$
F	$< 50\%$

TEXTBOOK

- **Required:**
  Dean, Robert G. and Dalrymple, Robert A. (1991), Water Wave Mechanics for Engineers & Scientists (Advanced Series on Ocean Engineering-Vol. 2), World Scientific Pub Co Inc, 353 pp., ISBN: 978-981-02-0421-1.

- **Alternative Reference Books:**
  Wiegel, Robert L. (2005), Oceanographical Engineering, Dover Publications, 544 pp., ISBN: 978-0486446004.

  Lighthill, James (2001), Waves in Fluids (Cambridge Mathematical Library Series), Cambridge University Press; 2 edition, 524 pp., ISBN: 978-0521010450.

  Mei, Chiang C. (1991), The Applied Dynamics of Ocean Surface Waves (Advanced Series on Ocean Engineering-Vol. 1), World Scientific Pub Co Inc; 2 edition, 760 pp., ISBN: 978-9971507893.

  Whitham, G. B. (1999), Linear and Nonlinear Waves, Wiley-Interscience, 660 pp., ISBN: 978-0471359425.

  Coastal Engineering Manual (Part II, Chapter 1: Water Wave Mechanics), US Army Corps of Engineers, 2006 (PDF version available online at http://chl.erdc.usace.army.mil/cem).

COURSE COMMUNICATIONS	Course-related material, along with class communications, are held on *eCampus* through *Howdy* portal. Students are expected to check and use the course webpage on regular basis.
COURSE DESCRIPTION	Physical and mathematical fundamentals of ocean wave behavior. Mechanics of wave motion. Use of statistics and probability to develop design wave criteria.
LEARNING OUTCOMES	The course in intended to familiarize students with formation, propagation and transformation of regular and irregular surface waves in water of constant or variable depth, and fundamentals of interaction of water waves with structures. Conservation laws, governing equations, and wave theories will be discussed. Upon completion of the course, students should be able to explain applicability of different wave theories, and the kinematic and dynamic of water particles, including velocities and pressures, in deep, intermediate or shallow waters. This course supports the ABET criteria b, d, g and k, as following, and criteria 1, 5 and 7: a. An ability to apply knowledge of mathematics, science and engineering; b. An ability to design a system, component, or process to meet desired need; d. An ability to identify, formulate, and solve engineering problems; g. An ability to communicate effectively; k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
PREREQUISITES	CVEN 311. Enrollment in MASE major degree sequence.
ATTENDANCE AND MAKE-UP POLICES	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. Late arrivals count as absences.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). If the absence is excused, the student will be provided an opportunity to make up any quiz, exam or other work that contributes to the final grade. The evaluation method will be decided by the instructor. The evaluation date is agreed upon by the student and instructor.
ACADEMIC INTEGRITY	*An Aggie does not lie, cheat or steal, or tolerate those who do.* For additional information visit: `http://www.tamug.edu/HonorSystem`.
AMERICANS WITH DISABILITIES ACT (ADA)	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/Disabilities.html`.

Tentative
Schedule

Monday	Wednesday	Friday
Jan 18th **1**	20th **2** Course Introduction	22nd **3** Preliminaries
25th **4** Fluid Motion	27th **5** Fluid Motion	29th **6** Conservation Laws
Feb 1st **7** Irrotational Motion	3rd **8** Irrotational Motion	5th **9** Governing Eqs. and B.C.
8th **10** Linear Wave Theory	10th **11** Linear Wave Theory	12th **12** Linear Wave Theory
15th **13** Dispersion Relation	17th **14** Particle Kinematics and Dynamics	19th **15** Particle Kinematics and Dynamics
22nd **16** Particle Kinematics and Dynamics	24th **17** Wave Energy	26th **18** Nonlinear Wave Theories
29th **19** Stokes 2nd Wave Theory	Mar 2nd **20** Shallow-water Wave Theories	4th **21** Cnoidal Wave Theory
7th **22** Solitary Wave Theory	9th **23** Mid-term Review	11th **24** **Mid-Term Exam**
14th **25** **SPRING BREAK**	16th **26** **SPRING BREAK**	18th **27** **SPRING BREAK**
21st **28** Wave Refraction	23rd **29** Wave Refraction	25th **30** Reading Day; No Class
28th **31** Shoaling-Refraction	30th **32** Wave Diffraction	Apr 1st **33** Wave Runup
4th **34** Wave Breaking	6th **35** Harbor Oscillation	8th **36** Tides and Currents
11th **37** Irregular Waves	13th **38** Irregular Waves	15th **39** Irregular Waves
18th **40** Wave Spectra	20th **41** Wave Spectra	22nd **42** Wave Spectra
25th **43** Wave Loads	27th **44** Wave Loads	29th **45** Wave Loads
May 2nd **46** **Final Exam Review**	4th **47** Reading Day; No Class	6th **48**

Midterm Exam: Friday, March 11, 2016, 02:00PM to 03:30PM.
Final Exam: Monday, May 9, 2016, 02:00PM to 04:00PM.