

FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL¹

UGPC APPROVAL _____
 UFS APPROVAL _____
 SCNS SUBMITTAL _____
 CONFIRMED _____
 BANNER POSTED _____
 CATALOG _____

DEPARTMENT: OCEAN AND MECHANICAL
ENGINEERING

COLLEGE: ENGINEERING AND COMPUTER SCIENCE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX _____ EOC _____ COURSE NUMBER ~~XXXX~~ 6515 LAB CODE (L or C) _____

(TO OBTAIN A COURSE NUMBER, CONTACT MJENNING@FAU.EDU)

COMPLETE COURSE TITLE: SHIP STRUCTURAL DESIGN

EFFECTIVE DATE

(first term course will be offered)

CREDITS:² 3

TEXTBOOK INFORMATION:

- Ship Structural Design: A Rationally-Based, Computer-Aided Optimization Approach - Owen F. Hughes, Published by SNAME, Jersey City, New Jersey, 1988
- Basic Ship Theory – 5th edition, K.J. Rawson and E.C. Tupper, Butterworth-Heinemann, Oxford, U.K., 2001

GRADING (SELECT ONLY ONE GRADING OPTION): REGULAR SATISFACTORY/UNSATISFACTORY _____

COURSE DESCRIPTION, NO MORE THAN THREE LINES:

This course is an in-depth review of: ship structural design including hull girder and thin walled structures under still water and wave induced shear forces and bending moments, ship design philosophy, society rules, bending of plates, buckling of plates and stiffened panels, slamming loads on hull structures, and fluid structure interactions.

PREREQUISITES*:

Graduate standing in Ocean, Mechanical, or Civil Engineering discipline with Strength of Materials and Structures background.

CO-REQUISITES*:

NONE

REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:

* PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE:

Faculty contact, email and complete phone number:

Dr. Hassan Mahfuz, Professor
 Room 179, Bldg. 36, Ocean and Mechanical
 Engineering Dept., Boca Campus
hmahfuz@fau.edu
 561 297 3483

Please consult and list departments that might be affected by the new course and attach comments.³

The course does not affect any other Department.

Approved by:	Date:	1. Syllabus must be attached; see guidelines for requirements: www.fau.edu/provost/files/course_syllabus.2011.pdf 2. Review Provost Memorandum: Definition of a Credit Hour www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf 3. Consent from affected departments (attach if necessary)
Department Chair: <u>Amad Alavi</u>	<u>11-21-13</u>	
College Curriculum Chair: <u>William T. Rhodes</u>	<u>17Mar14</u>	
College Dean: <u>[Signature]</u>	<u>3/17/14</u>	
UGPC Chair: <u>[Signature]</u>	<u>3/24/14</u>	
Graduate College Dean: <u>[Signature]</u>	<u>3/28/14</u>	
UFS President: _____	_____	
Provost: _____	_____	

Email this form and syllabus to UGPC@fau.edu one week before the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.

**Department of Ocean and Mechanical Engineering
Florida Atlantic University
Graduate Course Syllabus**

7. Course objectives/student learning outcomes/program outcomes

Course objectives: To introduce fundamental knowledge of ship theory needed to design and analyze ship structures under hydrostatic and wave induced shear force and bending moments that result in primary hull stresses.

Student learning outcomes

1. Ability to understand naval society-based and rationally-based structural design;
2. Ability to analyze hull girder response;
3. Ability to determine wave loads – statistical, dynamic, and nonlinear aspects;
4. Ability to apply matrix stiffness method to analyze Frames and Grillages;
5. Ability to formulate plate bending and buckling;
6. Ability to perform hull strength analysis;

8. Course evaluation method

Home Work	10%
Midterm	30%
Project	20%
Final Exam	40%

9. Course grading scale:

Above 90% = A- to A; Between 80% and 90% = B- to B+; Between 70% and 79% = C- to C+; Between 60% and 69 % = D- to D+; Below 60% = F (+ grade will be given if the score is at the high end of the grade range and – grade for the score at the low end. For example, total score of between 74 and 76 will be given a C grade, a score from 70 to 73 will be given C- and that from 77 to 79 will be given C+).

10. Policy on makeup tests, late work, and incompletes:

Makeup test will be given only if there is a valid reason (medical, family emergency etc) that prevented the student from taking tests. Similarly, an incomplete grade will be considered if the student has compelling reasons for not being able to complete the course requirements.

11. Special course requirements:

N/A

12. Classroom etiquette policy

University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions.

13. Disability policy statement

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures. See http://www.fau.edu/eop/ada/ada_policy.php.

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14. Code of Academic Integrity Policy Statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at

[www.fau.edu/regulations/chapter4/4.001 Code of Academic Integrity.pdf](http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf)

15. Required texts/reading

- Lecture Notes
- Ship Structural Design: A Rationally-Based, Computer-Aided Optimization Approach - Owen F. Hughes, Published by SNAME, Jersey City, New Jersey, 1988
- Basic Ship Theory – 5th edition, K.J. Rawson and E.C. Tupper, Butterworth-Heinemann, Oxford, U.K., 2001

16. Supplementary/Recommended readings

- Elementary Linear Algebra, 5th Ed., R.E. Larson, and B.H. Edwards, D.C. Heath and Company, 2012
- Structural Analysis, 8th Ed., R.C. Hibbeler, Prentice Hall, 2012
- Introduction to Matrix Methods of Structural Analysis, Harold C. Martin, McGraw Hill – Inc., 1966

17. Course topical outline, including dates for exams/quizzes, papers, completion of reading

Each of the topics shown below would require on an average 3 contact hours;

1. Naval Society-Based Structural Design
2. Rationally-Based Structural Design
3. Flootation and Trim
4. Hull Girder Analysis – Prismatic Beam
5. Influence Lines for Ship Structures
6. Hull Girder Transverse Shear Stress Analysis
7. Hydrostatic and Wave Loads
8. Vertical, Horizontal, and Torsional Moments; Coupling at Quartering Seas
9. Bending of Plates
10. Elastic Buckling of Plates and Stiffened Panels
11. Matrix Stiffness Analysis
12. Introduction to Finite Element Method
13. Beam and Frame Analysis
14. Ultimate Strength Analysis of Ship Hulls
15. Slamming Loads on Ship Structures

Tentative Test Dates:

Midterm: TBA

Project Presentation: TBA

Project Report Due: TBA

Final Exam: TBA