FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL[1]

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 6667__ **LAB CODE** (L or C) __C__

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

COMPLETE COURSE TITLE: OCEAN INSTRUMENTATION

EFFECTIVE DATE
(first term course will be offered)
SUMMER 2014

CREDITS[2]: 3

TEXTBOOK INFORMATION:
Marc Le Menn, "Instrumentation and metrology in oceanography", ISBN: 978-1-84821-379-1, Wiley.

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

COURSE DESCRIPTION, NO MORE THAN THREE LINES:
This course provides an overview of instrumentations and data analysis that are required for design, fabrication and calibration of ocean systems such as; platforms and offshore structures, autonomous underwater vehicles, surface vessels, underwater imagery, pressure vessels and pipelines.

PREREQUISITES *:	**COREQUISITES*:**	**REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:**
Graduate standing in Ocean, Mechanical, or Electrical Engineering discipline	**NONE**	

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

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: PHD IN OCEAN ENGINEERING, MECHANICAL ENGINEERING, ELECTRICAL ENGINEERING OR CLOSELY RELATED FIELDS

Faculty contact, email and complete phone number:	Please consult and list departments that might be affected by the new course and attach comments.[3]
Dr. Pierre-Philippe Beaujean EG-190 (Bdg 36), room 178 pbeaujea@fau.edu 561-297-0530	This course does not affect any other department.

Approved by:	*Date:*	
Department Chair:	11-21-13	1. **Syllabus** must be attached; see guidelines for requirements: *www.fau.edu/provost/files/course syllabus.2011.pdf*
College Curriculum Chair: William T. Rhodes	17Mar14	
College Dean:	3/17/2014	2. Review **Provost Memorandum: Definition of a Credit Hour** *www.fau.edu/provost/files/Definition Credit Hour Memo 2012.pdf*
UGPC Chair:	3/24/14	
Graduate College Dean:	3/28/14	
UFS President:		3. **Consent** from affected departments (attach if necessary)
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
Course Syllabus

1. Course title/number, number of credit hours	
Ocean Instrumentation - EOC [redacted] 6667	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: Graduate standing in Ocean, Mechanical, or Electrical Engineering discipline	
3. Course logistics	
Term: Summer 2013 This is a classroom lecture course with 3 projects *Class location and time*: TBA The course has no design content	
4. Instructor contact information	
Instructor's name *Office address* *Office Hours* *Contact telephone number* *Email address*	Dr. Pierre-Philippe Beaujean EG-190 (Bdg 36), room 178 TBA 561-297-0530 pbeaujea@fau.edu
5. TA contact information	
TA's name *Office address* *Office Hours* *Contact telephone number* *Email address*	No TA
6. Course description	
This course provides an overview of instrumentations and data analysis that are required for design, fabrication and calibration of ocean systems such as; platforms and offshore structures, autonomous underwater vehicles, surface vessels, underwater imagery, pressure vessels, and pipelines.	
7. Course objectives/student learning outcomes/program outcomes	
Course objectives	The objective of the course is to provide the students with basic and applied knowledge of ocean instrumentation, with a focus on ship instrumentation, motion sensors, positioning, underwater imagery, measurement of strain, and analysis of strain gage data.
8. Course evaluation method	
Homework (5) 50% Labs (5) 50%	
9. Course grading scale	
A (95%-100%), A- (90%-94%), B+ (85%-89%), B (81%-84%), B- (76%-80%), C+ (71%-75%), C (67%-71%), C- (62%-66%), D+ (57%-61%), D (52%-56%), D- (45%-51%), F (below 45%)	
10. Policy on makeup tests, late work, and incompletes	

Makeup tests are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements

Late work is not acceptable.

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

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

15. Required texts/reading

Marc Le Menn, "Instrumentation and metrology in oceanography", ISBN: 978-1-84821-379-1, Wiley (2012).

16. Supplementary/recommended readings

Recommended readings:
Jerome Williams, "Oceanographic Instrumentation", Naval Institute Press, ISBN 0-87021-503-5 (1973).
J.P. Strand, A.J. Sorensen, M. Ronaess, T.I. Fossen, F. El-Hawari (editor-in-chief), "The Ocean Engineering Handbook", CRC press, ISBN 978-0849385988 (2000).
M.W. Atherton, "Echoes and Images, the Encyclopedia of Side Scan and Scanning Sonar Operations", Oyster Ink Publications, Vancouver, BC, Canada, ISBN 978-0986903403 (2010).
L.E. Mertens, "In-Water Photography Theory and Practice", Wiley Interscience, ISBN 0-47159-630-2.
James W. Dally and William F. Riley, "Experimental Stress Analysis", McGraw-Hill Book Company, New York, ISBN 978-0070152182 (1970).

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

Department of Ocean and Mechanical Engineering
Florida Atlantic University
Course Syllabus

Course Topics: (45 contact hours total)

1) Ocean instrumentation platforms and sensors (6 contact hours)
   a) Ships and ship-mounted instruments
   b) Autonomous vehicles (surface, underwater, gliders) and associated sensors
   c) Buoys and buoy-mounted instruments
   d) Towed bodies
   e) Lab 1: ship instrumentation
2) Position and motion sensing (10 contact hours)
   a) Scientific background
   b) Technology
   c) Lab 2: motion sensing in an unmanned underwater vehicle and on a surface vessel
3) Underwater imagery (10 contact hours)
   a) Scientific background
   b) Technology
   c) Lab 3: underwater acoustic and video imagery
4) Environmental data collection (9 contact jours)
   a) Scientific background
   b) Technology
   c) Mapping
   d) Lab 4: ocean turbidity mapping and ocean temperature mapping
5) Strain Measurement in Ocean Platforms and Structures (10 contact hours)
   a) Types
   b) Strain and the stress-strain relations
   c) Strain measurement methods and related instrumentations
   d) Analysis of strain gage data
   e) Underwater pressure vessels and pipelines
   f) Lab 5: stress analysis of a pressure vessel under hydrostatic pressure

Blackboard: Class notes, practice exercises and problems, laboratory assignments and other administrative information will be posted on *Blackboard*. Make sure you can access the information related to this class as early as possible.

Homework: Weekly homework will be assigned. The instructor will post the solutions on *blackboard*. Homework posting and due dates are given in the course schedule at the end of the syllabus.

Computer and Laboratory Projects: Complete 5 computer and/or laboratory projects which are focused on ship instrumentation, motion sensors, positioning, underwater imagery, measurement of strain, and analysis of strain gage data. Every assignment is considered as an individual work. Do not submit any work that is not yours. It is encouraged to exchange ideas between students, but do not copy any portions of another student's work. The programs written must be included in the report. Project posting and due dates are given in the course schedule at the end of the syllabus.

Department of Ocean and Mechanical Engineering
Florida Atlantic University
Course Syllabus

Class	Material Covered	Assignment	Due
1	Ocean instrumentation platforms		
2	Ocean instrumentation platforms	HW#1	
3	Lab 1 - ship instrumentation	Lab 1	
4	Position and motion sensing		
5	Position and motion sensing	HW#2	HW#1
6	Position and motion sensing		
7	Lab 2 - in-lab motion sensing		HW#2
8	Lab 2 - field motion sensing	Lab 2	Lab 1
9	Underwater imagery		
10	Underwater imagery	HW#3	
11	Underwater imagery		
12	Lab 3 - in-pool imagery		HW#3
13	Lab 3 - field imagery	Lab 3	Lab 2
14	Environmental data collection		
14	Environmental data collection	HW#4	
15	Environmental data collection		
16	Environmental data collection		Lab 3
17	Lab 4 - mapping of turbidity and temperature data (using lab 3 data)	Lab 4	HW#4
18	Materials		
19	Materials		
20	Materials	HW#5	
20	Materials		Lab 4
21	Lab 5 - pressure vessel strain measurements under hydrostatic pressure	Lab 5	HW#5
	Lab 5 report due 5 days after actual lab 5		