FLORIDA INSTITUTE OF TECHNOLOGY

ADDING A NEW COURSE TO THE CURRICULUM

This is a request for reactivation of a course in the system.  □ Yes  □ No

New courses are available beginning with the fall term in which they appear in the University Catalog.

SUBJECT  □ O □ C □ E  COURSE NO.*  2 9 0 1  CREDIT HOURS  3  ACADEMIC YEAR TO BE ADDED TO THE FILE  Fall 2018

*Justify level if 1000-level and no co- or prerequisites

CLASS HOURS 45/semester  LECTURE HOURS 45/semester  LAB HOURS 0/semester  CONTACT HOURS (CEU ONLY)  N/A

DEPARTMENT  Ocean Engineering and Sciences

SCHEDULE TYPE Field (J)

□ COLLEGE OF AERONAUTICS – 23
□ NATHAN M. BISK COLLEGE OF BUSINESS – 24
□ COLLEGE OF ENGINEERING – 1
□ COLLEGE OF PSYCHOLOGY AND LIBERAL ARTS – 25

COMPUTER TITLE  Surf Engineering Analysis

□ COLLEGE OF SCIENCE – 26
□ EXTENDED STUDIES/NMB COLLEGE OF BUSINESS – 90
□ SCHOOL OF COMPUTING – 29
□ SCHOOL OF HUMAN CENTERED DESIGN, INNOVATION & ART – 28

This course will be entered into the system as:  Bi-Level □ Cross-Listed □ Dual-Numbered □ Full-Load □ None of these/Standard Listing □

CATALOG TITLE  Surf Engineering Analysis

CATALOG DESCRIPTION OF COURSE Restricted to 150 characters, including spaces

Focuses on analysis of data collected in the field. Includes design of field experiments to identify and collect data necessary to establish a relationship between the dynamics of surfing and wave characteristics. Aims to enhance knowledge and intuition through field-intensive format. Requires swimming certification for water activities.

This description has been approved by the catalog office  3/21/2017

In addition, please attach a course syllabus and/or more detailed description.

ADDITIONAL RESTRICTION □ and □ or (e.g., Major, Class Level, Department Head Approval)

If this course replaces a course currently offered in BANNER, please indicate old course information and the date/term the course may be removed from the system.

SUBJECT Alpha Prefix (e.g., CSE) COURSE NO. (e.g., 1301) TERM TO INACTIVATE

□ Yes  □ No  Will this course be used to measure program-level student learning outcomes? If yes, review and signature required.**

□ Yes  □ No  Will this course be used to satisfy the scholarly inquiry requirement? If yes, attach "O" materials for review.

□ Yes  □ No  Will this course impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program impacted.

APPROVALS: On completion of description and course number verification, affix appropriate signatures as indicated, and submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

Originator  Chair, Graduate Council  Date

Department Head/Program Chair  Date

Dean of Associate Dean  Date

Chair, Undergraduate Curriculum Committee  Date

□ Chief Academic Officer

CATALOG & CURRICULUM MANAGER

These changes/additions have been made for the University Catalog and entered into the BANNER term named above.

Catalog & Curriculum Manager  Date

REGISTRAR’S USE ONLY

SCACSE  SCADTL  SCAPREQ  SCABASE  ACALOG

SCABRES  OR Code  Operator Init.  Date

Florida Institute of Technology  Office of the Registrar

150 West University Boulevard, Melbourne, FL 32901-6975  (321) 674-8114  Fax (321) 674-7427

MSR-297-816
OCE 2901 SURF ENGINEERING ANALYSIS

Spring 2018

Catalog Data: Focuses on the analysis of data collected in the field. Includes design of field experiments to identify and collect data necessary to establish a relationship between the dynamics of surfing and wave characteristics. Aims to enhance knowledge and intuition through a field-intensive format. Swimming certification required for water activities. Prerequisites: PHY 1001

Credits & Contact Hours: 3 Credits, 29 lectures (75 minutes)

Required or Elective or Selected Elective: Selected Elective

Prerequisite and Co-Requisite Courses: Prerequisite PHY 1001 Physics 1

Textbook (T) and References (R):
(R) Munson, Young, Okiishi, and Huebsch, Fundamentals of Fluid Mechanics, 7th edition, John Wiley & Sons

Course Outcomes: Upon successful completion of this course, the student should be able to:

1. Identify common terminology used in data analysis,
2. Design a field data collection experiment,
3. Determine the important variables for understanding engineering problems,
4. Explain and apply basic physics as it applies to the ocean,
5. Discuss properties and characteristics of water waves relating to time series analysis,
6. Understand methods for data processing and error handling
7. Qualitatively and quantitatively describe coastal wave environment,
8. Deploy and retrieve instrumentation in the surfzone,
9. Analyze field data using time-series analysis techniques such as spectral analysis and filtering.

Topics Covered:

1. Physics of Surfing (2 classes)
2. Data analysis (5 classes)
3. Basic water wave theory and fluid mechanics (1 class)
4. Experimental design (3 classes)
5. Field experiment design and implementation (6 classes)
6. Instrumentation (selection and deployment) (2 classes)
7. Data acquisition and recording (2 classes)
8. Dimensional Analysis (2 classes)
9. Statistical Methods (2 classes)
10. Data Processing and presentation (2 classes)
11. Time series analysis techniques in MatLab (2 classes)
12. Field deployment and Projects: Students will complete projects outside of class time and will have some field deployments outside of regular scheduled class time.
Class Schedule: Mondays & Wednesdays; 9:30 am-11:00 am

Field Trips: We will be meeting at the beach nearly every other week when the field data collection begins. Dates TBD based on tides and weather.

Grading Policy: Will follow undergraduate grading system in catalog.
A: 90 – 100%, B: 80 – 89%, C: 70 – 79%, D: 60 – 69%, F: < 60%

Student performance will be evaluated through homework, participation in field experiments, exams, and a final design report according to the following distribution:
25% Homework, 25% Field / Lab Participation, 25% Exams, 25% Final report

Relationship of Course Outcomes to Student Outcomes: See assessment matrix.

Person who prepared this description and date:
Robert J. Weaver, Ph.D. – April 4, 2017
Associate Professor of Ocean Engineering

Requirements:
In addition to the material in the textbook and references, the homework assignments and the exams, each student will participate in mandatory field data collection and analysis. Each student is responsible for their health and will need to bring towel, sunscreen, water and snack to each field experiment. Prior to the first field experiment, a swim test is required to be performed as a class at the FIT Pool.
<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>a</th>
<th>b</th>
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<table>
<thead>
<tr>
<th>Key</th>
<th>Student Outcome Descriptions</th>
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<tbody>
<tr>
<td>a</td>
<td>An ability to apply knowledge of mathematics, science, and engineering</td>
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<tr>
<td>b</td>
<td>An ability to design and conduct experiments, as well as analyze and interpret data</td>
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<td>c</td>
<td>An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability</td>
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<td>d</td>
<td>An ability to function on multi-disciplinary teams</td>
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<td>An ability to identify, formulate, and solve engineering problems</td>
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<td>An understanding of professional and ethical responsibility</td>
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<td>An ability to communicate effectively</td>
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<td>The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context</td>
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<td>A recognition of the need for, and an ability to engage in life-long learning</td>
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<td>j</td>
<td>A knowledge of contemporary issues</td>
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<tr>
<td>k</td>
<td>An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice</td>
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</table>

♦ = The Course Outcome *lightly* addresses the Student Outcome
◆ = The Course Outcome *strongly* addresses the Student Outcome

Course Outcomes Assessment Matrix completed by: R. J. Weaver, Ph.D., Associate Professor of Ocean Engineering.

Date: 03/21/2017