# Florida Institute of Technology

## ADDING A NEW COURSE TO THE CURRICULUM

This course is available for student registration only after the approval process has been completed.

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>OCE</th>
<th>COURSE NO.</th>
<th>4590</th>
<th>CREDIT HOURS</th>
<th>3</th>
<th>TERM TO BE ADDED TO THE FILE</th>
<th>Fall 2009 (e.g., Fall 2006)</th>
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</thead>
<tbody>
<tr>
<td>CLASS HOURS</td>
<td>45</td>
<td>LECTURE HOURS</td>
<td></td>
<td>LAB HOURS</td>
<td>CONTACT HOURS (CEU ONLY)</td>
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<tr>
<td>DEPARTMENT</td>
<td>Marine and Environmental Systems (e.g., Computer Sciences)</td>
<td>SCHEDULE TYPE</td>
<td>Lecture (A) (e.g., Lecture, Lab or Special Project)</td>
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<td></td>
<td></td>
<td>COLLEGE OF AERONAUTICS-23</td>
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<td>COLLEGE OF PSYCHOLOGY AND LIBERAL ARTS-25</td>
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<td>COLLEGE OF BUSINESS-24</td>
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<td>COLLEGE OF SCIENCE-26</td>
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<td>COLLEGE OF ENGINEERING-01</td>
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<td>UNIVERSITY COLLEGE EXTENDED STUDIES-27</td>
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COMPUTER TITLE: Restricted to 25 characters, including spaces

Des Marine Prop Sys

CATALOG TITLE: Design of Marine Propulsion Systems

CATALOG DESCRIPTION OF COURSE: Limited to 350 characters, including spaces

Provides an understanding and working knowledge of resistance characteristics of different types of vessels. Explains the principles of propellers and water-jet operations and the theory and performance analysis as propulsion devices. Teaches how to design an efficient propulsion system for a specific vessel under consideration.

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

<table>
<thead>
<tr>
<th>RESTRICTIONS</th>
<th>Prerequisite</th>
<th>Course Number</th>
<th>□ Corequisite</th>
<th>Course Number</th>
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<tbody>
<tr>
<td></td>
<td>Prerequisite</td>
<td>Course Number</td>
<td>□ Corequisite</td>
<td>Course Number</td>
</tr>
<tr>
<td></td>
<td>Prerequisite</td>
<td>Course Number</td>
<td>□ Corequisite</td>
<td>Course Number</td>
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GRADES TO BE ISSUED

- □ A, B, C, D, F
- □ A, B, C, D, F, CEU
- □ CEU
- □ S, U
- □ P, F
- □ Other

ADDITIONAL RESTRICTION: Note: This will be a dual-numbered course with OCE 5590 (e.g., Major, Class Level, Department Head Approval)

If this course replaces a course currently offered in BANNER, please indicate old course information

<table>
<thead>
<tr>
<th>SUBJECT Alpha Prefix (e.g., CSE)</th>
<th>COURSE NO. (e.g., 1301)</th>
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APPROVALS: Upon completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee for approval below and forward to Catalog Director.

<table>
<thead>
<tr>
<th>Originator</th>
<th>Date</th>
<th>Chair, Graduate Council</th>
<th>Date</th>
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<tbody>
<tr>
<td>P. Caho</td>
<td>02-10-09</td>
<td></td>
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<tr>
<td>J. Maas</td>
<td>02-10-09</td>
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Department Head/Program Chair

Dean or Associate Dean

<table>
<thead>
<tr>
<th>Chair, Undergraduate Curriculum Committee</th>
<th>Date</th>
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CATALOG DIRECTOR

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

Catalog Director

<table>
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<tbody>
<tr>
<td>SCACRSE</td>
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<tr>
<td>SCARRS</td>
</tr>
</tbody>
</table>

Renee's 271-5060

Florida Institute of Technology • Office of the Registrar

150 West University Boulevard, Melbourne, FL 32901-6975 • (321) 674-8114 • Fax (321) 674-7827
Course Outline

Course Title: Design of Marine Propulsion System
Code: OCE 4590 & OCE 5590
Credits: 3
Semester: Fall Year: 2009
Department: Marine and Environmental Systems
Campus: Melbourne, FL
Contact details

Instructor: Dr. Prasanta Sahoo
Position: Associate Professor
Campus: Melbourne
e-mail: psahoo@fit.edu
Phone: 321-674-8147
Fax: 321-674-7212
Room number: LINK, 238
Consultation hours:
Instruction
Lecture Venue
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Course description*

Provides an understanding and working knowledge on resistane characteristics of different types of vessels, propeller and water jet system characteristics so as to design an efficient propulsion system for the vessel under consideration.

Learning outcomes*

On completion of this unit, you should be able to:

- Explain concepts of resistance of floating vessels.
- Explain the effect of hull form parameters including bulbous bow on resistance.
- Conduct a critical analysis of a recent research paper on resistance of mono or multi-hull vessel.
- Conduct a practical resistance and powering estimation.
- Conduct and analyse a resistance experiment in the towing tank.
- Explain the principles of propeller and water-jet operation and carry out a practical propeller design.
- Explain the momentum theory and blade element theory of propellers.
- Generate and understand $K_T$, $K_Q$ -J curves.
- Explain the theory and performance analysis of water-jet as a propulsion device.
- Explain the causes of cavitation, its detrimental effects and how to prevent it occurring on a propeller and water-jet system.
Generic graduate attributes

Knowledge: Ability to apply knowledge of basic science and engineering fundamentals

Communication skills: Ability to communicate effectively, not only with engineers but also with the community at large. In-depth technical competence in at least one engineering discipline; Ability to understand problem identification, formulation and solution.

Problem-solving skills: Ability to utilise a systems approach to design and operational performance.

Global perspective: Ability to function effectively as an individual and in multi-disciplinary and multicultural teams, with the capacity to be a leader or manager as well as an effective team member.

Social responsibility: Understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development; Understanding of the principles of sustainable development; Expectation of the need to undertake lifelong learning and the capacity to do so.

Prior knowledge &/or skills

OCE 3030 Fluid Mechanics

Learning resources required

Requisite texts
There are no required text books for this subject. However a set of lecture notes will be available for purchase.

Recommended reading

Lewis, E., (1990), Principles of Naval Architecture, SNAME publication, New York


Technical papers on Resistance and Propulsion from various Journals and Conference Papers.

E- (electronic) resources

Library: It is recommended that students will avail themselves of the relevant books and journals and conference proceedings.

ANGEL: A set of lecture will be available to download. Also lecture slides may be available to download before the lecture takes place if students so desire.

Other

Equipment & materials
It is expected that at the minimum students should have an equivalent of CASIO-FX82 calculator, rulers and a flexi-curve.
**Computer hardware & software**

**Unit-specific software**

It may be necessary at some stage to make use of s/w available on the network in the CAD lab. Specifically the module HullSpeed of MaxSurf and Propeller Design of HYDROCOMP would be necessary for assignment purposes.

**Details of teaching arrangements**

**Lectures/Intensive sessions**

<table>
<thead>
<tr>
<th>Class</th>
<th>Day</th>
<th>Time</th>
<th>Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
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<td></td>
<td></td>
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<tr>
<td>Field Trip</td>
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<tr>
<td>Consultation</td>
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</tr>
</tbody>
</table>

**Tutorials**

There is no time allocated separately for tutorials. Tutorials form part of lectures in this unit.

**Workshops/seminars**

Information on workshops/seminars will be intimated to all students through appropriate channels during the course of the semester.

**Online activities**

None planned at this stage.

**Videoconference activities**

None planned at this stage.

**Practical/laboratory sessions**

TBA.

**Field trips**

TBA.

**Practicum/work experience placements**

Not applicable at this stage.

**Course schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date Beginning</th>
<th>Topic</th>
<th>Readings/Resources</th>
<th>Further Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Intro to unit</td>
<td></td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Handout on Assignments</td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td></td>
<td>Background Theory</td>
<td>Chapter 1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Laminar &amp; Turbulent Flows</td>
<td>Chapter 1 contd.</td>
<td>Problems to solve</td>
</tr>
</tbody>
</table>
Learning expectations and strategies

**Expectations**
The University is committed to high standards of professional conduct in all activities, and holds its commitment and responsibilities to its students as being of paramount importance. Likewise, it holds expectations about the responsibilities students have as they pursue their studies within the special environment the University offers.

**Learning strategies**
Strategies used in the unit to achieve learning outcomes – e.g. group/collaborative activities, case/problem-based learning, project work, etc. Students are reminded that at least two hours of work per week outside class hours are necessary to achieve good grades. Students are also reminded to be extremely careful of numerical work involved within this unit.

**Specific attendance/performance requirements**
Attendance in this unit is not compulsory. However it is not the duty of the teacher to repeat salient features for students who are absent. It is the duty of the student to keep abreast of things on a day to day basis.

**Assessment**

TBA

**Assessment details**
Refer to separate document on assignments.
Submission of assignments*

TBA

Requests for extensions

Request for extensions/rescheduling can only be done under exceptional circumstances. Please discuss your options with the subject lecturer.

Penalties*

For each day of late submission a deduction 5% of total marks will take place with maximum deduction limited to 50% of marks obtained. Penalties may be waived at the discretion of the lecturer if valid grounds prevail or any other circumstances which might have contributed for the late submission.

Review of results and appeals

If you have questions or problems with your assessment, you should undertake discussion with the following people until you have received a resolution of the issues.

Academic referencing*

In your written work you will need to support your ideas by referring to scholarly literature, works of art and/or inventions. It is important that you understand how to correctly refer to the work of others and maintain academic integrity. Failure to appropriately acknowledge the ideas of others constitutes academic dishonesty (plagiarism), a matter considered by the University as a serious offence. The appropriate referencing style for this unit is

For information on presentation of assignments, including referencing styles:

Plagiarism*

Plagiarism is a form of cheating. It is taking and using someone else’s thoughts, writings or inventions and representing them as your own; for example, using an author’s words without putting them in quotation marks and citing the source, using an author’s ideas without proper acknowledgment and citation, copying another student’s work.

If you have any doubts about how to refer to the work of others in your assignments, please consult your instructor for relevant referencing guidelines, and the academic integrity resources on the web. The intentional copying of someone else’s work as one’s own is a serious offence punishable by penalties that may range from a fine or deduction/cancellation of marks and, in the most serious of cases, to exclusion from a Course, a course or the University.