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Fall 2015

NAME 6097

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University of New Orleans

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NAME 6097

Advanced Special Topics in Marine Engineering – Marine Engineering Process Modeling, Control and Automation

Fall 2015

COURSE DESCRIPTION & OBJECTIVES

The course covers subjects of contemporary interest in marine engineering. Topics to be addressed include:

1. Introduction to marine engineering systems onboard cargo, passenger and naval vessels
2. Marine engineering process modeling and analysis
3. Marine engineering thermodynamics
4. Marine powertrain dynamics
5. Marine engineering process simulation
6. Marine engineering process control

Upon completion of this course students should be able to:

1. Understand the fundamentals of and describe most common marine machinery
2. Identify dynamical systems and provide with descriptions thereof in the time and frequency domain
3. Calculate the response of linear dynamic systems and determine analogies and dualities between electrical, mechanical, hydraulic, pneumatic, thermal etc. marine engineering systems
4. Execute thermodynamic and performance calculations of marine power and propulsion plants
5. Develop control systems for marine engineering processes with an emphasis to propulsion systems and engines
6. Apply numerical simulation and post-processing techniques for marine engineering systems and shipboard machinery

PREREQUISITES

Consent of School.

CLASSES & ATTENDANCE

Location: EN 316

Hours: Tue & Thu 5 pm – 6:15pm US Central Time

Classes will be taught in an interactive manner. Therefore your attendance is very important. Penalty for inadequate class participation can be applied; your final grade could be decreased up to 5% for each absence exceeding two. Study over the entire semester in a session-to-session manner rather than just before the midterm or the final.

INSTRUCTOR

Nikolas Xiros, EN 914, nxiros@uno.edu

Office hours: Mon 6 pm – 8 pm, Wed 4:30pm – 6 pm, Thu 9 am – 10:30am or by appointment

REFERENCES

There is no textbook available covering the material of this course in its entirety. That is why you should take notes in class systematically. Lecture notes will also be handed out during class hours. Here are some additional references on various topics in the course.

- Lecture Notes (attendance required)
- MAN Diesel SE: Basic Principles of Ship Propulsion.
- Harrington R.L. (ed.) Marine Engineering. SNAME, 1992
- Blank D.A., Bock A.E., Richardson, D.J. Introduction to Naval Engineering. United States Naval Institute, 1985.
- Woud H.K., Stapersma D. Design of Propulsion and Electric Power Generation Systems. IMarEST, 2002.
- Crowley J. The Running and Maintenance of Marine Machinery. IMarEST, 1992
- Plumb C.M. Warship Propulsion Systems. IMarEST.
- Xiros N.I. Robust Control of Diesel Ship Propulsion. Springer, 2002.
- Knak C. Diesel Motor Ships' Engines and Machinery. IMarEST, 1990.
- Ogata K. System Dynamics. Prentice Hall, 1997 (3rd ed.).
- Bequette, B.W. Process Control; Modeling, Design and Simulation. Prentice Hall, 2003 (ISBN: 0133536408).
- Qiu L. & Zhou K. Introduction to Feedback Control. Prentice-Hall, 2009 (1st ed., ISBN: 0132353962).

HOMEWORK

The following four (4) homework assignments evenly distributed over the semester will be given:

1. Modeling of marine engineering systems
2. Marine engine thermodynamics & performance
3. Marine propulsion power plant analysis
4. Shipboard process control and automation

Each assignment will count 10% toward your final course percentage grade.

The exact submission date of each assignment will be specified on the problem sheet; generally plan to have two weeks available for each assignment. Late submission will not be accepted without prior consent of the instructor.

EXAMS

There will be a midterm exam (75 min long tentatively on Tue, OCT 6 2015 during class hours). The final exam per <http://www.uno.edu/registrar/bulletin/finals.aspx> is scheduled for Tue, DEC 8 2015, 8 pm – 10 pm (conflict time used since no specific is mentioned in the schedule).

GRADING

Grading Distribution: Homework 40%, Midterm 25%, Final 35%

Grading Scale – Course letter grade will be assigned based on the percentage as follows

91 <= A < 100; 79 <= B < 91; 67 <= C < 79; 52 <= D < 67; F < 52

ACADEMIC INTEGRITY

Academic integrity is fundamental to the process of learning and evaluating academic performance. Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, the following: cheating, plagiarism, tampering with academic records and examinations, falsifying identity, and being an accessory to acts of academic dishonesty. Refer to the UNO Judicial Code for further information. The Academic Dishonesty Policy is available online at: <http://www.uno.edu/student-affairs-enrollment-management/documents/academic-dishonesty-policy-rev2014.pdf>

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Students who qualify for services will receive the academic modifications for which they are legally entitled. It is the responsibility of the student to register with the Office of Disability Services (UC 260) each semester and follow their procedures for obtaining assistance.

CLASSROOM CONDUCT

1. Be in class on time. Please do not come five, ten, or twenty minutes late. Distracting interruptions are inconsiderate, disrespectful, and time-wasting. There is no excuse for repeatedly arriving late. Parking is often a hassle; allow enough time for it.
2. Cell phones should be turned off before class begins and remain switched off during class. Under no circumstances, your cell phone should ring in the class.
3. Sexual harassment as defined in UNO document <http://www.uno.edu/president/administrative-policies/documents/AP-BA-32.2-Discrimination-Harassment-and-Retaliation-4-29-14.pdf> is unacceptable behavior and will not be tolerated. Sexual harassment is a violation of state and federal law. Sexual harassment has a negative impact on the functioning of the University. Consequently, all members of the University community must be sensitive to the possibility of sexual harassment whether intended or inadvertent. Individuals must recognize this potential and act to prevent it. When sexual harassment has occurred, the University shall take effective and expeditious action.
4. Keep weapons out of the classroom.
5. Feel free to ask questions of the instructor during class. But please do not ask other students, as talking disturbs my concentration and the concentration of other class members.
6. Students are expected to treat faculty and fellow students with respect. Any actions that purposefully and maliciously distract the class from the work at hand will not be allowed.
7. Civility in the classroom and respect for the opinions of others is very important in an academic environment. It is likely you may not agree with everything that is said or discussed in the classroom. Courteous behavior and responses are expected.

More at:

http://sacs.uno.edu/compliance-certification/docs%5CUNO_Student_Handbook.pdf