SYLLABUS & COURSE INFORMATION
MEC 364: INTRODUCTION TO FLUID MECHANICS
FALL 2017

DESCRIPTION:
Fundamental properties of fluids and their conservation laws with applications to the design and evaluation of flows of engineering interest. Topics include hydrostatics, surface tension, dimensional analysis and dynamic similitude, Euler's equation, rotating coordinate systems, boundary layers, lubrication, drag on immersed bodies, open channel and pipe flows, and turbomachinery.

INSTRUCTOR: <u>Dr. Thomas Cubaud</u>
Office Hours: Monday (3:00 – 5:00 PM), Thursday (2:00 – 4:00 PM),
Location: Light Engineering Building, room 107, Phone: 631-632-1110
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TEACHING ASSISTANTS: <u>Ioannis Nikiforakis</u>
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TA Office Hours: TBD

WEEKLY SCHEDULE: LECTURE – Monday, Friday (1:00 – 2:20 PM)
Location: Javits Lecture Hall, room 102
RECITATION – Wednesday (10:00 – 10:53 AM)
Recitation R01 location: Melville Library, room W4550
Recitation R02 location: Javits Lecture Hall, room 109

TEXT: Title – Introduction to Fluid Mechanics, from 6th to 9th Edition
Authors – Fox, McDonald and Pritchard
Publisher – John Wiley & Sons, Inc., New York

CREDIT EARNED: 3 credits

GRADING: Your semester letter grade will be based upon your performance in the following categories:

Homework – 15%
Exam I – 25%
Exam II – 25%
Final Exam – 35%

There will be no make-up exams unless arranged prior to the exam.
Each of the exams will be cumulative.

HOMEWORK: Homework problems will be available on Blackboard before the Wednesday recitation and will be due the following Wednesday unless otherwise directed. Late homework will not be accepted.

COURSE LEARNING OBJECTIVES:
1. An ability to quantitatively represent fluid flow variables using dimensions and units.
2. An understanding of the concept of viscous flow, including pressure, viscosity, and surface and body forces.
3. An understanding of the principle of manometer as a measuring instrument and determining the hydrostatic force on submerged surfaces.
4. Applying mass conservation and the integral method to determine the force between fluid flow and surfaces of hydraulic machinery.
5. An ability to use velocity field representation to determine the incompressibility, irrotationality, and acceleration of a fluid flow.
6. An understanding of Navier-Stokes equations.
7. An ability to apply Bernoulli Theorem.
8. An understanding of the concept of boundary layers.

DISABILITY SUPPORT SERVICES (DSS) STATEMENT – If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

EMERGENCY EVACUATION – Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: http://www.stonybrook.edu/ehs/fire/disabilities

ACADEMIC INTEGRITY STATEMENT – Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

CRITICAL INCIDENT MANAGEMENT – Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.

CALCULATOR POLICY – Effective Fall 2008, only the following calculators will be permitted on all midterm and final exams in the Department of Mechanical Engineering. There will be no exceptions! This list of calculators is identical to that allowed for the *National Council for Examiners for Engineering and Surveying* (NCEES) Fundamentals of Engineering (FE) exam that many of you will take in your senior year, as well as the Professional Engineering (PE) exam that you may take several years from now. The sooner you become comfortable on one of these calculators, the better.

Allowed calculators:

- **Casio:** All **fx-115** models. Any Casio calculator must contain **fx-115** in its model name.
- **Hewlett Packard:** The **HP 33s** and **HP 35s** models, but no others.
- **Texas Instruments:** All **TI-30X** and **TI-36X** models. Any Texas Instruments calculator must contain either **TI-30X** or **TI-36X** in its model name.

The NCEES policy on calculator can be found here: http://www.ncees.org/exams/calculators/