

Fall 2015

ENCE 3318

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University of New Orleans

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UNIVERSITY OF NEW ORLEANS
DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

ENCE 3318
PRINCIPLES OF HYDRAULICS

COURSE DESCRIPTION

The civil engineering science of fluid mechanics provides the knowledge and understanding of fluid properties, the application of the basic laws of mechanics and conservation principles to fluid flow, and the orderly investigation of flow phenomena through experimentation. The ability to analyze and design hydraulic systems without overlooking the limitations of our state of knowledge, and the complicated and interrelated nature of the real world is based on the knowledge gained in this course.

PRE-REQUISITE or CO-REQUISITE: Credit or registration in (ENCE 2301 or (ENCE 2302 and ENCE 2303)) and credit or registration in ENME 2750.

TEXTBOOK: Engineering Fluid Mechanics; by Clayton T. Crowe, Donald F. Elger, Barbara C. Williams and, John A. Roberson; 10th edition, John Wiley & Sons, Inc.

LECTURES: Tuesday and Thursday: 11:00 AM -12:15 PM, EN 316

INSTRUCTOR

Donald E. Barbe', Ph.D., P.E., F.ASCE

Office: EN 821

Phone: 280-6283

email: dbarbe@uno.edu

OFFICE HOURS: Tuesday and Thursday: 12:15-1:00 PM
On –line: TBA
OR by appointment

GRADING SCHEME

ATTENDANCE:	10%
TESTS: 4 @ 22.5% each.	90%
FINAL EXAM:	22.5%
(I will drop your lowest 22.5%)	

GRADING SYSTEM

A	90 and up
B	80 to 89
C	70 to 79
D	60 to 69
F	Below 60

Course Objectives

The student should be able to solve problems related to:

1. Fluid properties (Viscosity, elasticity, surface tension)
2. Fluid statics (pressure measurement, hydrostatics forces on submerged objects, buoyancy)
3. Conservation of Mass Equation
4. Bernoulli's Equation
5. Conservation of Momentum Equation
6. Conservation of Energy Equation
7. Computation of energy loss due to friction in flowing liquid
8. Computation of energy loss due to minor losses in flowing liquid
9. Flow in Conduits systems

RECOMMENDED REFERENCES

Fluid Mechanics – An Interactive Text; by James A. Liggett and David A. Caughey; ASCE PRESS.

Computer Applications in Hydraulic Engineering – connecting Theory to Practice; Haestad Press. www.bentley.com/books

Elementary Hydraulics, 1st Edition Cruise/Singh/Sherif ISBN-10: 0-534-49483-8 ISBN-13: 978-0-534-49483-4 © 2007 608 pages

TOPIC OUTLINE

Tentative Schedule

Chapter Topic

- 1 Introduction
- 2 Fluid Properties
- 3 Fluid Statics

TEST 1

- 4 The Bernoulli Equation and Fluids in Motion
- 5 Control Volume Approach and Continuity Equation

TEST 2

- 6 Conservation of Momentum Principle
- 7 Conservation of Energy Principle

TEST 3

- 8 Dimensional Analysis
- 9 Prediction Shear Force
- 10 Flow in Conduits

TEST 4

FINAL EXAM – Tuesday, December 8, 2015, 10:00 AM to 12:00 Noon

GENERAL INSTRUCTIONS ON THE ADMINISTRATION OF THE CLASS:

- 1) The nature of this course is such that attendance is required in order to maintain the requisite continuity to pass the course. If you cannot attend class for some reason, call the instructor or the Engineering secretary and explain why. You must sign in on a sign-in sheet passed around during class.
- 2) You should read all assignments and take and maintain detailed notes. All students are encouraged to ask questions and to enter into class discussions. The instructor is unable to determine the degree of understanding by each student. For this reason it is each student's responsibility to ask for clarification of any topic he feels is needed.
- 3) Students are expected to conduct themselves according to the principles of academic integrity as defined in the statement on Academic Dishonesty in the UNO Student Code of Conduct. Any student or group found to have committed an act of academic dishonesty shall have their case turned over to the Office of Student Accountability and Advocacy for disciplinary action which may result in penalties as severe as indefinite suspension from the University. Academic dishonesty includes, but is not limited to: cheating, plagiarism, fabrication, or misrepresentation, and being an accessory to an act of academic dishonesty.
- 4) Assignments that are turned in late will have 10 points per class deducted.
- 5) In case of withdrawal from the course or resignation from the University, the course grade will be determined from the work completed according to the grading schedule.
- 6) I am generally available with the exception of those times when I am in class, busy with my research work or other university and professional duties. Please make an appointment.
- 7) It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirements. Students who seek accommodations for disabilities must contact the Office of Disability Services prior to discussing their individual needs for accommodation with their instructors.
- 8) 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. Cell phones should be turned off before class begins.
- 9) 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.
- 10) 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.

- 11) 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.
- 12) Students must have Internet access to www.uno.edu and the Moodle portion of ENCE 3318. All communications, including the posting of grades will be done through Moodle. Students are responsible for all e-mail communications from the instructor to their UNO email account. Help with Moodle can be accessed at <http://www.uno.edu/moodle>.
- 13) Students are expected to fully participate in all classroom activities. Full participation means that students arrive on time, have prepared for class by completing all assignments, and are ready for active and purposeful engagement with the topic at hand.