Department of Ocean and Mechanical Engineering
Florida Atlantic University
Course Syllabus

1. Course title/number, number of credit hours

EML 3701 – Fluid Mechanics	3 credit hours

2. Course prerequisites, corequisites, and where the course fits in the program of study

Prerequisites: EGN 3311 – Statics, or equivalent
EGN 3343 – Engineering Thermodynamics, or equivalent
MAP 3305 – Engineering Mathematics I

3. Course logistics

Term: Summer 2019
This is a classroom lecture course.
Class location and time: Physical Science Building – Boca Raton: Room 109
Tues/Thurs 12:30pm-2:40pm

4. Instructor contact information

Instructor's name	Siddhartha Verma
Office address	Boca Raton Engineering West 176 / Seatech 235
Office Hours	Tues & Thurs 3:00 – 4:00 PM (or by Appointment)
Contact telephone number	954.924.7202
Email address	vermas@fau.edu

5. TA contact information

TA's name	Aishwarya Nair Eric Jagodinski
Office address	
Office Hours	
Contact telephone number	
Email address	

6. Course description

Characteristics of a fluid, fluid statics, flow fields, fundamental laws, control volume concept, some applications of the fundamental laws in integral form, dimensional analysis and similitude, flow in pipes, single-path pipe line problems, networks and boundary layer concepts.

7. Course objectives/student learning outcomes/program outcomes

Course objectives	The objective of this course is to introduce students to the basic concepts and laws of fluid mechanics and their application to engineering and scientific problems.

Student learning outcomes & relationship to ABET 1-7 objectives	1. Students will be able to determine the forces on plane and curved submerged surfaces. (1,2,6) 2. Students will be able to analyze fluid flow systems by the control volume approach; such as the power developed by a pump, the flow rate through a pipe using a Venturi meter, the drag on an object by measuring the flow field velocity around the object, forces on a plate from an impinging jet. (1,2,6) 3. Students will be able to determine the pressure drop in a pipe resulting from viscous or turbulent effects. (1,2,6) 4. The student will be able to communicate effectively in writing a report. (3)

8. Course evaluation method

Homework 15% Quizzes 20% Group Project 15% Midterm 20% Final Exam 30%	Weekly homework to be submitted online on Canvas, graded on a scale of 0 to 2. Short in-class quizzes will be administered approximately every two weeks. There will be a mid-term exam halfway through the course. A group project involving a student-designed fluids experiment and a written report will be due before the final exam. Part of the project grade will be based on peer-evaluation.

9. Course grading scale

A	**> 95%**	**C+**	**70 – 74.9**
A-	**90 – 94.9**	**C**	**65 – 69.9**
B+	**85 – 89.9**	**C-**	**60 – 64.9**
B	**80 – 84.9**	**D**	**50 – 59.9**
B-	**75 – 79.9**	**F**	**< 50**

In case the final class average is lower than a 'B-', all grades will be adjusted upward.

10. Policy on makeup tests, late work, and incompletes

Late work will not be accepted unless there is solid evidence of a medical or otherwise serious emergency that prevented the student from completing the assignments on time. Incomplete grades are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation, incomplete grades will not be given.

11. Special course requirements

12. Classroom etiquette policy

University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions.

13. Disability policy statement

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS)—in Boca Raton, SU 133 (561-297-3880); in Davie, LA 203 (954-236-1222); or in Jupiter, SR 110 (561-799-8585)—and follow all SAS procedures.

14. Honor code policy

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at
www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf

15. Counseling and Psychological Services Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to http://www.fau.edu/counseling/

16. Required texts/reading

There are no required textbooks for this course.

17. Supplementary/recommended readings

Fundamentals of Fluid Mechanics: by Bruce R. Munson, Alric P. Rothmayer, Theodore H. Okiishi, Wade W. Huebsch.

Fluid Mechanics: by Pijush K. Kundu, and Ira M. Cohen.
(Note: ***Free digital copy*** available through the FAU library)

18. Course topical outline, including dates for exams, papers, completion of reading

Topics:

1. Characteristics of a fluid.
2. Fluid statics: pressure distribution in a stationary fluid, forces and moments on plane and curved submerged surfaces, buoyancy, U.S. Standard Atmosphere, pressure distribution in a uniformly accelerating fluid.
3. Fundamental laws in integral form for a moving fluid; control volume concept, conservation of mass, the linear momentum equation, the energy equation, applications.
4. Fundamental laws in differential form: conservation of mass, Euler's equation, streamlines, and Bernoulli's equation.
5. Real flows: turbulence, Reynolds number, dimensional analysis and the Pi theorem, similitude, modeling, wind tunnel tests.
6. Viscous Flow in ducts: the friction factor, Moody diagram, pressure drop in a duct, and three types of pipe-flow problems.
7. Additional topics at the discretion of the instructor.

Exam dates:

Mid-term Exam: June 20th, 2019 – in class
Final Exam: August 1st, 2019 – in class