

<b>1. Course title/number, number of credit hours</b>	
OE Fluid Mechanics / EOC 3123	4 credit hours
<b>2. Course prerequisites, corequisites, and where the course fits in the program of study</b>	
Prerequisites: EGN 3321, Dynamics; EGN 3343 Engineering Thermodynamics; EOC 3130L OE Lab (all with a grade of C or above).	
<b>3. Course logistics</b>	
<i>Term:</i> Spring 2019 This is a classroom lecture course <i>Class location and time:</i> WF 10-11:50 am (Lecture) GS109	
<b>4. Instructor contact information</b>	
<i>Instructor's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	Dr. Stewart Glegg, Professor Engineering West (Blg-36) Bldg., Room 185 T: 9-11am 561-297-2633 <a href="mailto:sglegg@fau.edu">sglegg@fau.edu</a>
<b>5. TA contact information</b>	
<i>TA's name</i> <i>Office address</i> <i>Office Hours</i> <i>Contact telephone number</i> <i>Email address</i>	NA
<b>6. Course description</b>	
The first course of a two-semester study of incompressible-fluid flow and its application to ocean engineering with emphasis on fluid properties, hydrostatic forces, buoyancy and stability of floating bodies including metacentric height concepts, fluid dynamics, dimensional analysis, modeling, real flows in closed conduits and open channels, boundary-layers, lift and drag, turbo-machines, computational and experimental methods, resistance and propulsion of marine vehicles, and design problems. A grade of "C" or better is required for the major	
<b>7. Course objectives/student learning outcomes/program outcomes</b>	
<i>Course objectives</i>	The objective of the course is to provide the basic foundation in fluid mechanics in preparation for the study of particular fluid dynamic applications that will be presented in Ship Hydrodynamics.
<i>Student learning outcomes &amp; relationship to ABET 1-7 objectives</i>	The learning outcomes of the course (and related ABET Criterion 3) outcomes are: 1. An understanding of the basic properties of fluids with emphasis on seawater. (a/1) 2. The ability to calculate forces associated with hydrostatic pressure, buoyancy and an understanding of stability criteria for floating bodies. (e/1) 2. An understanding of the constitutive equations of fluid flow (a/1)

	<p>3. The ability to calculate forces associated with momentum changes in fluid flows (e/1)</p> <p>4. A useful working knowledge of dimensional analysis, similarity and modeling which can be applied to a wide spectrum of engineering analyses (a,e/1)</p> <p>5. A fundamental understanding of the role of viscosity in real flows with emphasis on the calculation of skin friction for external flows and pressure gradients for internal flows (a,e/1)</p>
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**8. Course evaluation method**

Two exams during class (15% ea)	30%	<p><i>Note:</i> The minimum grade required to pass the course is C.</p> <p>Quizzes will be held on a regular basis throughout the semester based on homework assignments. Make up quizzes may be given, but only with prior permission from the instructor based on an email request.</p>
Homework Quizzes	25%	
Projects	15%	
Comprehensive Final Exam	<u>30%</u>	
	<u>100%</u>	

**9. Course grading scale**

Grading Scale:  
 95 and above: "A", 90-95: "A-", 85-90: "B+", 80-85: "B", 75-80: "B-", 70-75: "C+", 65-70: "C", 60-65: "C-", 55-60: "D+", 50-55: "D", 45-50: "D-", 45 and below: "F."

The final grade for the course will be the numerical average of grades assigned for all work in each of the categories listed above weighted according to the percentages shown.

The instructor reserves the right, in exceptional cases, to raise or lower the final numerically averaged course grade by 2.5% in cases where the instructor does not believe that the average is representative of the student's performance in the class. Normally, the student will receive the numerically-averaged letter grade for the course.

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

Students are expected to attend all classes and complete homework and projects assignments. Any exam missed will be averaged as a zero. Make-ups will not be given except in the case of illness, or with the prior permission of the instructor.

An Incomplete, or an "I", will only be given out if a student, while carrying a passing average, becomes ill and is unable to complete the course on time. An "I" will not be given out to a student failing the course

**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](http://www.fau.edu/regulations/chapter4/4.001_Code_of_Academic_Integrity.pdf)

Cell phones are not allowed during exams. If cell phones are detected during any exam periods, this will result in a **grade of "zero" on that exam and a note in the student's academic file.**

#### **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**

D. F. Elger, B.C. Williams, C. T. Crowe and J. A. Roberson, Engineering Fluid Mechanics,, 10<sup>th</sup> or 11th Edition, John Wiley & Sons, 2013

#### **17. Supplementary/recommended readings**

#### **18. Course topical outline, including dates for exams/quizzes, papers, completion of reading**

Course Topics :

Week 1: Introductions

Week 2: Fluid Properties

Week 3: Fluid Statics

Week 4: The Bernoulli Equation and Pressure Variation

Week 5: The Bernoulli Equation and Pressure Variation

Week 6: Continuity Equation

Week 7: Momentum Equation

Week 8: Momentum Equation

Week 9: The Energy Equation

Week 10: Dimensional Analysis and Similitude

Week 11: Dimensional Analysis and Similitude

Week 12: Predicting Shear Force

Week 13: Flow in Conduits

Week 14: Drag and Lift (Project Report Due)

Homework problems will be assigned weekly on Canvas prior to classes. Approximately 6-10 problems based on problems from each of chapters of the text book will be assigned. Weekly quizzes on homework problems will be held and will be based on homework problems. The two mid term and the final exams will be a comprehensive tests and students will be allowed to use their text books and notes.

In addition the students will be required to complete an individual project and submit a report.

Exam Dates:

Mid term I : February 8<sup>th</sup> 2018

Mid Term II March 20<sup>th</sup> 2018.

Final Exam: W (May 1st) 7:45am-10:15am

