|  |
| --- |
| **1. Course title/number, number of credit hours** |
| Fluid Mechanics – EML 3701 |  3 credit hours |
| **2. Course prerequisites, corequisites, and where the course fits in the program of study** |
| Prerequisites: 1. EGN 3311: Statics or equivalent2. EGN 3343: Engineering Thermodynamics or equivalent3. MAP 3305: Engineering Mathematics I or MAP 2302 Differential Equations I |
| **3. Course logistics** |
| *Term*: Spring 2014This is a classroom lecture with at least 1 laboratory experimentRoom: GS 103; Time: M, W 1:00-1:50PM; F 1:00-2:50PM |
| **4. Instructor contact information** |
| *Instructor’s name**Office address**Office Hours* *Contact telephone number**Email address* | Dr. Oscar M. CuretEngineering West (EG-36), Room 172M: 2-3pm, W: 2-3 pm561-297-1560ocuret@fau.edu |
| **5. TA contact information** |
| *TA’s name**Office address**Office Hours* *Email address* | Amir KazemiEngineering West, Room 267TBAakazemi2012@fau.edu |
| **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* | To introduce our students to the basic concepts and laws of fluid mechanics and their applications to engineering and scientific problems. |
| *Student learning outcomes* | 1. Students will be able to determine the forces on plane and curved submerged surfaces. (a,e,k)
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. (a,e,k)
3. Students will be able to determine the pressure drop in a pipe resulting from viscous or turbulent effects. (a,e,k)
4. The student will be able to effectively communicate in writing a report. (g)
 |
| **8. Course evaluation method** |
| Homework and Quizzes Test1Test2Experiments & ReportsFinal Examination 10% | 10%, Weekly20%, Feb. 07, 2014 in class20%, Mar. 28, 2014 in class15%, 35% Apr. 28, 2014 @ 10:30am- 1pm |
| **9. Course grading scale** |
| **Course Letter Grade:** Above 90% = A- to A; Between 80% and 89% = B- to B+; Between 70% and 79% = C- to C+; Between 60% and 69 % = D- to D+; Below 60% = F (+ grade will be given if the score is at the high end of the grade range and – grade for the score at the low end. For example, total score of between 74 and 76 will be given a C grade, a score from 70 to 73 will be given C- and that from 77 to 79 will be given C+). |
| **10. Policy on makeup tests, late work, and incompletes** |
| *Makeup test* are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student from taking the test. *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** |
| Students have to perform a laboratory experiment during the semester; it will be a team effort. |
| **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, are to be disabled in class sessions. |
| **13. Disability policy statement** |
| In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD 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) |
| **15. Required texts/reading** |
| *Fundamentals of Fluid Mechanics*, 7th edition by Munson, Okiishi, Huebsch and Rothmayer. Wiley & Sons, Inc. |
| **16. Supplementary/recommended readings** |
| - Cengel, Y. A. and Cimbala, J*. Fluid Mechanics: Fundamentals and Applications* 2nd edition, 2010, McGraw-HillHigher Education- White, F. M. *Fluid Mechanics* 7th edition, 2010, McGraw-Hill- Batchelor, G. K. *An Introduction to Fluid Dynamics*, Cambridge University Press, 1967 |
| **17. Course topical outline, including dates for exams/quizzes, papers, completion of reading** |
| 1. **Introduction and Basic Concepts**: characteristic of a fluid.2. **Fluid statics**: pressure distribution in a stationary fluid, forces and moments on plane and curved submerged surfaces, buoyancy, standard atmosphere, pressure distribution in a uniformly accelerating fluid.3. **Flow Kinematics**: Bernoulli’s equation, application of Bernoulli’s equation, Eulerian and Lagrangian descriptions of flow, flow pattern, streamlines. 4. **Fundamental laws in fluid dynamics**: Conservation of mass, conservation of linear momentum (integral and differential form), control volume concept, inviscid flow, Euler’s Equations, potential flow. 5. Overview of **dimensional analysis** and modeling.6. **Viscous flow in pipes**: Laminar and turbulent flow, friction factor, pressure drop in a pipes, and Reynolds number.7. **Flow over immersed bodies:** Lift, drag, and boundary layer.**- Homework and Quizzes:** Weekly**- 2Tests:** Feb. 07, 2014 & Mar. 28, 2014 (all in class)**- Laboratory Projects****- Final Examination**: Apr. 28, 2014 @ 10:30am- 1pm |