CE 321

Fluid Mechanics

Department of Civil Engineering

King Saud University

Course Description: CE 321 Fluid Mechanics (Required for a BSCE degree)	Fluid properties , Fluid pressure on points , Fluid pressure on surfaces , Buoyancy , Stability of floating and submerged objects , Flow types ,Continuity equation , Momentum equation , Energy equation , Pressure measurements , velocity measurements , discharge measurements , Flow resistance . 3(3,1,0)
Prerequisite	GE 201 (Statics), MA 203 (Differential Equations) 1. Understanding of cenroid of surfaces and bodeis. 2. Determining and solving differential equations.
Course learning **Objectives**	Students completing this course successfully will be able to 1. Understand basic fluid properties. 2. Determine magnitude of pressure values on points within fluid. 3. Determine pressure forces on different surfaces. 4. Determine the buoyant forces on objects. 5. Determining the stability of floating and submerged bodies. 6. Understand the concept of continuity of moving fluid with applications. 7. Use momentum concept to evaluate forces of moving fluid. 8. Understand and apply energy equation of moving fluid. 9. Measure fluid velocity and discharge in open channel and closed conduit. 10. Improve the communication skills, including reading, writing, oral presentations
Topics Covered **(15 Weeks)**	1. Fluid properties. (**2 weeks**) 2. Fluid pressure on points within a fluid. (**1 week**) 3. Fluid pressure on surfaces. (**4 weeks**) 4. Buoyancy principles (**1 week**)

	5. Fluid flow equations. (**4 weeks**)
	6. Fluid flow measurements. (**1.5 weeks**)
	7. Fluid resistance. (**1.5 weeks**)
Class/ tutorial Schedule	Class is held three times per week in 50-minute lecture sessions. There is also a 50-minute weekly tutorial associated with this course.
Computer Applications	Commercial and educational fluid software are encouraged to be used during the course.
Project	Not applicable.
Contribution of Course to Meeting the Professional Component	1. Students learn the main fluid mechanics principles as related to civil engineering applications. 2. Students improve their writing, communication and analyzing skills. 3. Students recognize the role of professional societies in developing codes and standards and updating current knowledge.
Relationship of Course to Program Outcomes	1. Students apply algebra, elementary calculus, and principles of mechanics. 2. Students are able to identify and formulate an engineering problem and to develop a solution. 3. Students recognize the importance of analysis in designing hydraulic structures. 4. Students are encouraged to submit accurate analysis in an efficient and professional way. 5. Students are encouraged to recognize the different fluid systems and their range of applications. 6. Students recognize the ethical and professional responsibility in achieving accurate fluid analysis for safe and economical design, and its impact on the well-being of the society. 7. Students recognize the importance of reading and understanding technical contents in English in order to achieve life–long learning and be able to carryout their responsibilities. 8. Students recognize the important role of computers in facilitating analysis and design of fluid problems. 9. Students are encouraged to improve their writing, communication and presentation skills.
Textbook(s) and/or Other Required Material	Fluid Mechanics. By V. L. Streeter and E. B. Wylie. McGraw

	Hill.
Instructor	Dr. Abdulrahman M. Al-Khomairi
Office	2A/22
Phone	46-78826
Grading:	
Two Midterm Exams	40%
Tutorial, Quizzes, etc.	10%
Final Exam	50%