

## CE 320 Fluid Mechanics for Civil Engineering Students

### Department of Civil Engineering King Saud University

<b>Course Description:</b> CE 320 Fluid Mechanics (Required for a BSCE degree)	Units and Dimensions, Fluid properties, fluid pressure at a point, pressure variation with depth, hydrostatic forces on plane surfaces, hydrostatic forces on curved surfaces, buoyant forces, the stability of floating bodies, flow type, continuity equation, energy equation, momentum equation. 2(2,1,0)
<b>Prerequisite</b>	GE 201 (Statics), 1. Understanding of centroid of surfaces and bodies.
<b>Learning Outcomes</b>	Students completing this course successfully will be able to 1. Describe basic fluid properties. 2. Determine magnitude of pressure values on points within fluid. 3. Identify pressure forces on different surfaces. 4. Explain the buoyant forces on objects. 5. Discuss the stability of floating and submerged bodies. 6. Apply the concept of continuity of moving fluid with applications. 7. Calculate forces on moving fluid using the momentum concept. 8. Understand and apply energy equation of moving fluid.
<b>Topics Covered</b>	1. Fluid properties. 2. Fluid pressure on points within a fluid. 3. Fluid pressure on surfaces. 4. Buoyancy principles 5. Continuity, energy, momentum equations.
<b>Class/ tutorial Schedule</b>	Class is held two times per week in 50-minute lecture sessions. There is also a 50-minute weekly tutorial associated with this course.
<b>Computer Applications</b>	Not applicable in this course.
<b>Project</b>	Not applicable in this course.
<b>Contribution of Course to Meeting the Professional Component</b>	1. Students learn the main fluid mechanics principles as related to civil engineering applications. 2. Students recognize the role of professional societies in developing codes and standards and updating current knowledge.
<b>Relationship of Course to Program Outcomes</b>	This course will enhance the student's 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 importance of reading and understanding technical contents in English in order to achieve life-long learning and be able to carry out their responsibilities.
<b>Textbook(s) and/or Other Required Material</b>	Fundamentals of Fluid Mechanics (2013); 7th Edition (SI Version). Authors: Munson, Okiishi, Huebsch, Rothmayer
<b>Grading:</b>	15% TA & quizzes, 20% 1 <sup>st</sup> Midterm, 25% 2 <sup>nd</sup> Midterm, 40% Final