WASHINGTON STATE UNIVERSITY
VANCOUVER
World Class. Face to Face.

School of Engineering and Computer Science

MECH 303: Fluid Mechanics

Catalog Data:	**303 Fluid Mechanics** 3 Course Prerequisite: MECH 212. Physical properties, fluid statics, laminar and turbulent flow, impulse and momentum, similitude, pipe flow, boundary layers, lift, drag and measurement techniques, fluid experimentations. Recommended preparation: MATH 315. Typically offered Fall.
Class Schedule:	Three 50-minute lectures per week, for one semester
Laboratory Schedule:	None
Prerequisites by Course:	MECH 212. Recommended preparation: MATH 315.
Prerequisites by Topic:	1. Knowledge of how to apply a basic free body diagram is required, as is basic understanding of dynamics of solid particles. 2. Basic knowledge of conservation of mass, conservation of energy, and fluid properties is required.
Textbook:	B.R. Munson, D.F. Young, and T.H. Okiishi, *Fundamentals of Fluid Mechanics*, 8th Edition, John Wiley & Sons, Inc., 2016.
Course Coordinator:	Dr. Stephen Solovitz
Course Objectives:	1. Ability to classify fluid flow problems according to relevant simplifying assumptions for the problem. 2. Ability to simplify and solve problems with the hydrostatics equation, integral equations, and the energy equation for viscous and inviscid flows. 3. An understanding of the differential conservation of mass and momentum and the utility of derived equations. 4. Ability to simplify specific fluid problems with the aid of dimensional analysis. 5. Ability to apply the methods of similitude for model analysis. 6. Ability to design a simple pipe network to meet realistic design constraints.
Topics Covered:	1. Fluid Properties 2. Hydrostatics 3. Integral Equation Conservation of Mass, Momentum and Energy 4. Differential Conservation of Mass and Momentum 5. Dimensionless Groups and Similarity 6. Inviscid Fluid Flow 7. Viscous Internal Fluid Flow 8. Viscous External Fluid Flow
Lab Experiments and Activities:	None

Course Outcomes:	Students will be able to:	
	Assessed for Student Outcomes	1-a. Demonstrate an understanding of the fundamental equations of continuity, Newton's 2nd law, and the 1st law of thermodynamics. 1-c. Use different models, such as integral or differential techniques, to formulate solutions for specific fluid flows. 1-d. Apply mathematical principles, computational methods, or analytical techniques toward solving specific fluids problems with a range of complexity.

	Other	1-b. Evaluate assumptions or conditions to identify fluid flows, such as internal or external flow.

Required or Elective Course:	Required		
Relationship of Course to Program:	Meets: Educational Objectives 1 Student Outcomes 1		
Prepared by:	Stephen Solovitz	Date:	March 16, 2018 (4.6.18 mb) Correction (1.10.19 mb)
Approved by USC:	4/2/18		