

## FLORIDA STATE COLLEGE AT JACKSONVILLE

## COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: ETM 2310

COURSE TITLE: Fluid Mechanics

PREREQUISITE(S): MAC 1114 and ETI 1420

COREQUISITE(S): None

CREDIT HOURS: 3

CONTACT HOURS/WEEK: 4

CONTACT HOUR BREAKDOWN:

    Lecture/Discussion: 3

    Laboratory: 1

    Other \_\_\_\_\_:

FACULTY WORKLOAD POINTS: 3

STANDARDIZED CLASS SIZE ALLOCATION: 20

CATALOG COURSE DESCRIPTION:

The course deals with fluid properties, fluid statics, buoyancy and stability, flow of fluids in pipes and open channels, flow measurement, and forces due to fluids in motion.

SUGGESTED TEXT(S): Mott, Applied Fluid Mechanics, 5<sup>th</sup> edition, Prentice-Hall.

IMPLEMENTATION DATE: October 8, 1984

REVIEW OR MODIFICATIONS DATE: Fall Term, 2002 (20031)

COURSE TOPICS		CONTACT HOURS <u>PER TOPIC</u>
I.	Introduction	4
	A. Basic Fluid Properties	
	B. Systems of Units and Unit Conversion	
II.	Fluid Pressure	6
	A. Pascal's Law	
	B. Pressure Head	
	C. Pressure Gages	
	D. Fluid Power Cylinder	
III.	Forces on Submerged Plane Areas and Buoyancy	8
	A. Forces on Plane-Submerged Surfaces	
	B. Buoyancy-Archimedes Law	
	C. Stability of Bodies in Fluid	
IV.	Flow of Fluids	10
	A. Continuity Equation - Fluid Flow Rate	
	B. Conservation of Energy-Bernoulli's Equation and Applications	
V.	General Energy Equation	6
	A. Energy Losses and Additions	
	B. Power Required by Pumps	
	C. Power Delivered to Fluid Motors	
VI.	Viscosity, Laminar Flow and Turbulent Flow	6
	A. Dynamic and Kinematic Viscosities	
	B. Laminar Flow, Turbulent Flow and Reynold's Number	
	C. Friction Losses in Laminar Flow and Turbulent Flow	
VII.	Minor Losses	3
	A. Sudden Enlargement	
	B. Sudden Contraction	

## COURSE TOPICS (CONTINUED)

CONTACT HOURS  
PER TOPIC

	C. Equivalent Technique	
VIII.	Series Pipe Line Systems	3
IX.	Open Channel Flow	6
	A. Uniform steady flow in open channel	
	B. Geometry of open channels	
X.	Hydrology	2
	A. Rational Method	
XI.	Exams and Review	6

PROGRAM TITLE: Civil Engineering Technology

COURSE TITLE: Fluid Mechanics

CIP NUMBER: 0715.020101

LIST PERFORMANCE STANDARDS ADDRESSED:

NUMBER(S): TITLES(S):

01.0 SOLVE GENERAL, TECHNICAL, AND ENGINEERING TYPE PROBLEM-The student will be able to:

- 01.01 Given two pieces of data concerning a right triangle, compute the missing sides and/or angles.
- 01.02 Given necessary data concerning polygons, compute the area.
- 01.03 Given three pieces of data concerning an oblique triangle, compute the missing sides and angles.
- 01.04 Given necessary data concerning an oblique triangle, compute the area.
- 01.05 Given a line graph and one piece of data (ordinate or abscissa) solve for missing ordinate or abscissa data.
- 01.06 Read and interpret engineering related graphs.

16.0 SOLVE BASIC HYDRAULIC PROBLEMS USING THE THEORY OF INCOMPRESSIBLE FLUIDS--The student will be able to:

- 16.01 Compute peak discharge using "Use interim run off procedure for Florida - Soil conservation service".
- 16.02 Compute discharge due to developed condition of project.
- 16.03 Compute quantity of water and waste water flow and size pressure pipes.
- 16.04 Size pipes for gravity flow of storm waters.