Course Syllabus

FLUID MECHANICS

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Program: Oceanographic Engineering

1. Course number and name

MECG1049 - FLUID MECHANICS

2. Credits and contact hours

3 credits and 4 contact hours

3. Instructor's course or coordinator's name

MARIO RODRIGO PATIÑO AROCA

4. Text book, tittle, author, and year

• Munson, Young and Okiishi. Fundamentals of Fluid Mechanics (8th Edition)

a.Other supplemental materials

• White, F.. Fluid Mechanics (8th edition)

• Fox and McDonald's. Introduction to Fluid Mechanics (9th Edition)

• Yunus A. Cengel, John M. Cimbala. Fluid Mechanics: Fundamentals and Applcations (3rd Edition)

• Donald F. Elger, Barbara C. Williams, Clayton T. Crowe, John A. Roberson. Engineering Fluid Mechanics (10th Edition)

5. Specific course information

a. Brief description of the content of the course (catalog description)

This subject is an introduction to the mechanics of fluids that contributes to the training professional engineering student, with emphasis on comprehension and application of concepts and equations such as mass conservation, momentum and energy, integral, differential and dimentional analysis methods, and techniques for solving problems in engineering.

This module include fundamental concepts, fluid properties, pression distribution across fluids at rest and their applications, and the study of incompressible viscous flow in ducts and around blunt bodies and aerodynamic.

b. Prerequisites

PHYSICS: THERMODYNAMICS AND OPTICS - FISG1009
DIFFERENTIAL EQUATIONS AND LINEAR ALGEBRA - MATG1048
NUMERICAL METHODS - MATG1052

c. This course is: Required

6. Specific goals for the course

a.Specific outcomes of instruction

1.- Detremine pression distribution in compressible and incompressible fluid at rest, from the fundamental equation of fluid statics, to calculate manometric and absolute pressure and

standar properties at the atmosphere.

2.- Calculate mass and volumetric flows, forces, moments and powers in systems and hydraulic devices using in an integral way the equations of mass conservation, momentum and energy.

3.- Analyze speed and pressure field generated by simple flows and easy geometries using in diferential way the equation of mass conservation and linear momentum.

4.- Predict the behavior of a prototype through experimental studies in models applying dimensional analysis.

5.- Establish the pressure drops in pipelines thtough the calculation of friction losses and accessories for problems in laminar and turbulent flow regimes.

6.- Understand the characteristics and behavior of boundary layer in laminar and turbulent regime for stimating drag and lift forces in incompressible external viscous flow problems.

b. Explicity indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

7. Brief list of topics to be covered

1.-Evaluation activities

2.-Fundamental concepts and properties of fluids

3.- Integral analysis

4.- Incompressible internal and external viscous flow

5.- Differential analysis

6.- Dimensional analysis

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