

ABET Course Syllabus for MET 315: Fluid Dynamics

1. Course number and name: MET 315: Fluid Dynamics
2. Credits and contact hours: 4 credit hours, 4 hours per week
3. Instructor's Name: Dr. Jeunghwan "John" Choi
4. Textbook, title, author, and year:
 - Cengel, *Fundamentals of Thermal-Fluid Sciences*, 5e
 - a. Other supplemental materials:
 - Software for Internet access,
 - Word processing,
 - Spreadsheet,
 - Graphing capability required.
5. Specific course information:
 - a. Brief description of the content of the course (catalog description): Fluid statics, continuity, Bernoulli, and the general energy equation, laminar and turbulent flow, friction losses in pipes and ducts, pump performance and selection, compressible flow, and fluid measurements. Four hours lecture per week.
 - b. Pre-requisites: ETSC 311 with a grade C+ (2.3) or higher and MET 314 and MET 314LAB and MET 327 and MET 327LAB. Co-requisite: MET 315LAB.
 - c. Required, elective, or selected elective (as per Table 5-1) course in the program: Required
6. Specific goals for the course:

Learn the fluid dynamics concepts.

 - a. Specific outcomes of instruction:
 - Develop an understanding of the practical aspects of fluid statics and continuity by relating theory to various applications.
 - Learn to predict the flow rate of fluids in ducts and pipes for compressible and incompressible fluids.
 - Demonstrate the ability to plan and conduct fluid mechanics experiments. Students will demonstrate the ability to write various types of test reports common in the engineering field.
 - Earn terminology in the fluid dynamics technical field so that they may read, discuss and comprehend the relevant literature
 - Demonstrate the ability to select proper instrumentation to support experiments.
 - Perform computerized data analysis and be able to present and explain experimental results with clarity.

b. Criterion 3 student outcomes addressed by course:
3 (1)

7. Brief list of topics covered:

- Properties of fluids
- Fluid Statics
- Bernoulli and Energy Equations
- Momentum Analysis of Flow Systems
- Internal Flow
- External Flow

ABET Course Syllabus for MET 315: Fluid Dynamics Laboratory

1. Course number and name: MET 315: Fluid Dynamics Laboratory
2. Credits and contact hours: 1 credit hours, 2 hours per week
3. Instructor's Name: Dr. Jeunghwan "John" Choi
4. Textbook, title, author, and year:
 - Cengel, *Fundamentals of Thermal-Fluid Sciences*, 5e
 - a. Other supplemental materials:
 - Software for Internet access,
 - Word processing,
 - Spreadsheet,
 - Graphing capability required.
5. Specific course information:
 - a. Brief description of the content of the course (catalog description): Fluid statics, continuity, Bernoulli, and the general energy equation, laminar and turbulent flow, friction losses in pipes and ducts, pump performance and selection, compressible flow, and fluid measurements. Four hours lecture per week.
 - b. Pre-requisites: ETSC 311 with a grade of C+ (2.3) or higher and MET 314 and MET 314LAB and MET 327 and MET 327LAB.
 - c. Required, elective, or selected elective (as per Table 5-1) course in the program: Required
6. Specific goals for the course:

Apply fluid dynamics concepts.

 - a. Specific outcomes of instruction:
 - Assess the practical aspects of fluid statics & continuity by relating theory to various applications.
 - Apply the Bernoulli equation and the general energy equation and evaluate the energy content within a flowing fluid.
 - Predict the flow rate of fluids in ducts and pipes for compressible and incompressible fluids.
 - Calculate and use dimensionless numbers such as Reynolds number, lift and drag coefficients, etc.
 - Investigate terminology in the fluid dynamics technical field so that they may read, discuss and comprehend the relevant literature.
 - Plan and conduct fluid mechanics experiments.
 - Select proper instrumentation to support experiments and will calibrate various sensors and connect sensors to data acquisition systems.

- Perform computerized data analysis and be able to present and explain experimental results with clarity.
- Write various types of test reports common in the engineering field.

b. Criterion 3 student outcomes addressed by course:

3 (1)

7. Brief list of topics covered:

- Properties of fluids
- Fluid Statics
- Bernoulli and Energy Equations
- Momentum Analysis of Flow Systems
- Internal Flow
- External Flow