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| Department of Mechanical Engineering | |
|---|---|
| **Fluid Mechaics I (67320)** | |
| **Total Credits** | **3** |
| **major compulsory** | |
| **Prerequisites** | P1 : Differential Equations (21203) OR Engineering Mathematics (21202) P2 : Statics (67211) OR Statics (61110) |

**Course Contents**

Introduction to fluid mechanics and units, properties of fluids, and fluid statics. Basics of fluid flow. Energy in steady flow, momentum and forces in fluid flow. Similitude and dimensional analysis. Steady incompressible flow in pressure conduits, and applications to fluid machinery. Introduction to fluid measurements.

| | Intended Learning Outcomes (ILO's) | Student Outcomes (SO's) | Contribution |
|---|---|---|---|
| 1 | Defined the behavior and properties of fluid | A | 10 % |
| 2 | Identify the static pressure force that act on plane and curved surfaces | E | 25 % |
| 3 | Identify, formulate, and solve steady-state material and energy balance for describing the fluid flow | E | 40 % |
| 4 | Apply dimensional analysis for modeling and describing the general behavior of fluid flow in pipeline | E | 10 % |
| 5 | Analyze and design a typical pipeline process that contains major and minor losses process to meet the desired need. | C | 15 % |

**Textbook and/ or Refrences**

D.F. Young, B.R. Munson and T.H.Okiishi, A Brief Introduction to Fluid Mechanics, 2nd ed., John Wiley &Sons, Inc., 2001. References: J.O.Wilkes, Fluid Mechanics for Chemical Engineers, Prentice-Hall, 1999. N. deNevers, Fluid Mechanics for Chemical Engineers, 2nd ed., McGraw-Hill, 1991. R. L. Mott, Applied Fluid Mechanics, 4th ed., Prentice-Hall, 1994.

| Assessment Criteria | Percent (%) |
|---|---|
| First Exam | 20 % |
| Second Exam | 20 % |
| Quizzes | 10 % |
| Final Exam | 50 % |

**Course Plan**

| Week | Topic |
|---|---|
| 1,2 | Fluid properties |
| 3,4,5 &6 | Fluid Static |
| 6 &7 | Basics of fluid flow |
| 7 | First Exam |
| 8 &9 | Energy in steady flow |
| 10,11,12 | Momentum and forces in fluid flow |
| 13 | Second exam |
| 13,14 | Similitude and dimensional analysis |
| 14,15 | Steady incompressible flow in pressure conducts |
| 16 | Final Exam |