Engineering Technology –MET Option

Course Number and Name: ET 308, Fluid Technology

Credits & Contact Hours: 3cr., two weekly lectures of 75 min. each.
Total semester contact hours are approximately 40.

Instructor's name: Craig Ricketts
Textbook *title*,   *Applied Fluid Mechanics*,
author, and year: Mott, R. L., 2006.
Supplemental materials: *Spreadsheet tools* provided by author on CD that accompanies textbook, for calculation of friction losses in series and parallel flow pipe systems and for pump selection.

Specific Course Information:
  a. **Course Catalog Description** – Application of basic principles of fluid mechanics to practical applied problems.
  b. **Prerequisites** – ET 240 Statics and Math 235 Calculus I.
  c. **Laboratory** – See documentation for ET 308L Fluid Technology Laboratory.
  d. **Augmenting** – This is a required course in the CET and MET curricula.

Course Goals and Objectives:
  Student acquires an understanding of the physical concepts and basic principles of applied fluid mechanics. Also, student becomes acquainted with relevant problem solving methods and tools of good practice. Through repeated application of systematic approaches to problem solving, student gains pertinent experience in the analysis of fluid technology systems of contemporary practice, as well as insights into their design.

Related ABET Outcomes:
  The **following** are the MET (x.) and ABET student outcomes that directly relate to Criterion 3. *An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline;* to include:

  (1.) **Algebra**, trigonometry, Boolean mathematics, calculus, statistics and probability, **fundamental principles and concepts of science and engineering technology**, **good practice in problem solving**, and **methods of standard practice in the analysis** and applied design **of mechanical systems**.
  Also ABET 3.a., 3.b., 3.f., and 3.k.

  (4.) **Current software corresponding to good practice in the application of mechanical engineering technologies. Software application functions to include:** word processing, **spreadsheet calculations**, graphing, presentation media, computer assisted drafting and manufacturing, manufacturing processes, statistics, data acquisition, project management, and **the analysis** and **applied design of systems involving** mechanisms, machines, or **fluid and thermal processes**.
  Also ABET 3.a., 3.b., 3.f., and 3.k.

Course topics and class hours devoted to each topic:

Topics	Class Hours
· Introduction: field overview and significance, historical perspectives	1
· Fluid properties, units and basic definitions	1
· Viscosity and *Newtonian* and non-*Newtonian* fluids	1
· Pressure-height relation and forces of static fluids on submerged surfaces	3
· Buoyancy and stability	3
· Continuity equation and *Bernoulli* equation	3
· *Torricelli*'s theorem and flows with falling heads	1
· General energy equation	1
· *Reynold*s No., laminar and turbulent flow regimes, and friction losses in viscous flow	2
· Velocity profiles for circular cross-sections, flow in non-circular sections	1
· Minor friction losses in viscous flow	3
· Series and parallel pipeline systems	3
· Pump applications and selection	3
· Application of spreadsheets to friction-loss calculations and pump selection	1
· Flow of liquids in open channels	3
· Flow measurement and forces of moving fluids on solid bodies	3
· Aerodynamic drag and lift	3
· Examinations	3
· Topic Reviews	3

Laboratory Projects: See relevant documentation for separate laboratory course.

Examples of lab topics: See relevant documentation for separate laboratory course.

Prepared by: Craig Ricketts **Date**: 12/19/10