METROPOLITAN STATE COLLEGE *of* DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

School of: Professional Studies

Department: Engineering Technology

CIP Code: 15.0201

Prefix & Course Number: **CET 3185** **Crosslisted With*:** _____

Course Title: Fluid Mechanics I for Civil Engineering Technology

Check All That Apply: Required for Major: X Required for Minor: _____ Specified Elective: _____

Required for Concentration: _____ Elective: _____ Service Course: _____

Credit Hours: 3 (3+0)

Total Contact Hours per semester (assuming 15-16 week semester):

Lecture 45 Lab 0 Internship 0 Practicum 0 Other (please specify type and hours):_____

Schedule Type(s): L **Grading Mode(s)**: L

Variable Topics Courses (list restrictions, including the maximum number of hours that can be earned**):

____

** **NOTE: This information must be included in the course description.**

Restrictions (Variable Topics Course): _____

Prerequisite(s):

Corequisite(s): None

Prerequisite(s) or Corequisite(s): MET 3160 with a grade of "C" or better; or permission of instructor

Banner Enforced:

Prerequisite(s): _____
Corequisite(s): _____
Prerequisite(s) or Corequisite(s): _____

Catalog Course Description:
This course covers and studies the engineering applications of physical properties of ideal fluids, real fluids, hydrostatics, kinematics, energy considerations, momentum principle, dimensional analysis, and incompressible flow in pipes and ducts.

APPROVED:

Department Chair **OR** Program Director	3 Apr 08 Date
Dean **OR** Associate Dean	4/8/08 Date
Associate VP, Academic Affairs	5/19/08 Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

Prefix and Course Number: CET 3185

Required Reading and Other Materials will be equivalent to:
Finnemore. E. John, Franzini, Joseph B. (2002). *Fluid Mechanics With Engineering Applications*, 10th Edition. McGraw-Hill

Specific, *Measurable* Student Behavioral Learning Objectives:
Upon completion of this course the student should be able to:
1. Use basic concepts, principles, laws, observations, and models of fluids at rest and in motion.
2. Apply principles of hydrostatics for engineering design and control of fluid systems.
3. Apply principles of fluids in motion.
4. Solve problems of steady incompressible fluid flow in confined and pressurized pipes and ducts.
5. Calculate drag and lift forces for immersed objects.

Detailed Outline of Course Content (Major Topics and Subtopics) **or Outline of Field Experience/Internship (experience, responsibilities and supervision):**
I. Fluid Properties
   A. Gases
   B. Liquids
II. Fluid Statics
   A. Equilibrium of a confined fluid
   B. Buoyancy
   C. Loading on submerged surfaces
III. Energy Equations
   A. Continuity equation
   B. Bernoulli's theorem
   C. Impulse-Momentum equation
IV. Energy Considerations in Steady Flow
   A. Stream lines
   B. Incompressible steady flow
V. Momentum and Forces in Fluid Flow
   A. Forces on flat and curved plates
   B. Pipe bend reaction forces
VI. Steady Incompressible Flow in Pressure Conducts
   A. Flow friction
   B. Reynold's Number
   C. Moody diagram
VII. Forces on Immersed Bodies
   A. Incompressible Flow
   B. Friction drag of boundary layer.
   C. Laminar and turbulent boundary layer along a smooth flat plate.
   D. Friction drag along a smooth flat plate with a transition regime.
   E. Drag on two and three dimensional bodies.

Evaluation of Student Performance:
1. Assigned homework problems
2. Written examinations