

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 4150

Crosslisted With*: _____

Course Title: Highway Engineering and Surveying

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 _____ Internship _____ Practicum _____ Other (please specify type and hours): _____

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

Prerequisite(s): at least junior standing or permission of instructor

Corequisite(s): None

Prerequisite(s) or Corequisite(s): _____

Banner Enforced:

Prerequisite(s): _____

Corequisite(s): _____

Prerequisite(s) or Corequisite(s): _____

Catalog Course Description:

This course is a specialized course in requirements, functional characteristics, and system characteristics of highway design, incorporating surveying essentials for the civil engineering field. The course develops design methods, procedures, and analysis for pavement design, roadway alignment, and user information for freeways, city arterials, and rural roadways.

APPROVED: Paul P. Ross

Department Chair OR Program Director

1/21/2010

Date

Dean OR Associate Dean

Shelia A. Thompson

2/1/2010

Date

Associate VP, Academic Affairs

5/4/10

Date

*If crosslisted, attach completed Course Crosslisting Agreement Form

Prefix and Course Number: CET 4150

Required Reading and Other Materials will be equivalent to:

Wright, Dixon (2004). *Highway Engineering*, John Wiley.

Specific, Measurable Student Behavioral Learning Objectives:

Upon completion of this course the student should be able to:

1. Apply modern surveying methods for land measurement and/or construction layout.
1. Analyze functional classification and system characteristics of highway design.
2. Manage design controls and criteria for calculations and drawings for highway and street construction.
3. Organize design and structural criteria for highway and street construction.

Detailed Outline of Course Content (Major Topics and Subtopics) or Outline of Field Experience/Internship (experience, responsibilities and supervision):

- I. Classification and system characteristics of highway design
 - A. Requirements
 - B. Functional relationships
 - C. System characteristics
- II. Surveying
 - A. Surveying equipment
 - B. Survey control
 - C. Survey monitoring during construction
 - D. Total station instrument performance
 - E. Cut and fill calculations
 - F. Closing survey loops
 - G. Methods of writing field book notes
 - H. Basics of State Plane Coordinates and legal descriptions of property boundaries
- III. Highway and street constructions
 - A. Vehicle
 - B. Driver performance
 - C. Information systems
 - D. Highway capacity
 - E. Pedestrian considerations
 - F. Horizontal and vertical alignment
 - G. Drainage and lighting
 - H. Traffic signals
 - I. Drainage
- IV. Design and structural criteria for highway and street construction
 - A. Pavement
 - B. Curbs and walkways
 - C. Tunnels
 - D. Freeways
 1. Grade level
 2. Elevated
 - E. Intersections
 1. Grade level intersections
 2. Traffic control signals
 3. Overpasses
 4. Freeway interchanges

Evaluation of Student Performance:

1. Written examinations
2. Assigned homework problems
3. Formal written reports