

Engineering Technology – CET Option

Course Number and name: ET 412 Highway Technology

Credits and Contact Hours: Lecture - 3 credits/46 contact hrs.

Instructor's name: Ruinian Jiang

Textbook: **Principles of Highway Engineering and Traffic Analysis, 4th Edition** [Fred L. Mannering](#), [Scott S. Washburn](#), [Walter P. Kilareski](#), ISBN: 978-0-470-29075-0, 398 pages, September 2008

Other References: AASHTO, *A Policy on Geometric Design of Highways and Streets*, 4th Ed, American Association of State Highway and Transportation Officials, 2004; Highway Capacity Manual.

AASHTO Materials Part I & II, Guide for Design of Pavement Structures, Highway Drainage Guidelines, Manual on Subsurface Investigation, New Mexico Standard Specifications for Highway and Bridge Construction, Highway Engineering texts, Fundamentals Supplied Reference Book (web address below).

http://www.ncees.org/exams/study_materials/fe_handbook/fe_civil_engineering.pdf

Specific Course Information:

Course Catalog Description: Roadway design including geometry, materials, and drainage. Aspects of air and rail transportation relevant to job opportunities are discussed.

Course Prerequisites: SUR 222, ET 354

Goals/Objectives: To introduce students to techniques for designing a roadway including geometric design, materials selection, pavement design, and drainage. To help students develop an understanding of design criteria based on traffic characteristics. Assess student's ability to: interpret the purpose of course requirements, gather correct resources, present criteria, study alternatives, and finally develop a design.

This course will help achieve the following goals of the overall program outcomes (ABET outcomes):

highway geometry design	3a, b	9a
pavement design	3c	9c
highway drainage	3b	9d
highway capacity analysis	3b, c	9e
communicate effectively by participating in discussions oral presentation	3e	
communicate effectively by writing formal project reports	3g	

Course topics and approximate lecture hours devoted to each topic:

A. Geometric Design- vertical	4 hours
B. Geometric Design- horizontal	4 hours
C. Cross-section elements	3 hours
D. Drainage-hydrology	3 hours
E. Drainage-subsurface (inlets, pipes)	3 hours

F. Drainage-surface (ditches, culverts)	3 hours
G. Materials- soils review, subgrade	3 hours
H. Materials-subbase, base	3 hours
I. Flexible pavement design & Superpave	5 hours
J. Rigid pavement design	3 hours
K. Airport Design	3 hours
L. Rail/Commerce	3 hours
M. Plan and Profile	3 hours

Computer Usage: Software: Spreadsheets, Haested, Civil/survey drafting, HCS2000.

Prepared by Ruinian Jiang, December 2010.