PREREQUISITE: Introduction to Public Works
GRADING METHOD: Instructor's choice Grade or Pass/No Pass.

CATALOG COURSE DESCRIPTION

A comprehensive course in asphaltic concrete and Portland Cement concrete construction technology following the standards of the Asphalt Institute, standard specifications for public works construction, American Concrete Institute and the Portland Cement Association. Included will be design production, placement, consolidation and compaction of the materials. Evaluation of surface defects, maintenance and safety will be covered.

COURSE CONTENT

I. Petroleum
Asphalt
II. Mineral
Aggregates
III. Asphalt Concrete Mix
Design
IV. Soils
V. Manufacture of Hot Asphalt Plant Mixes
VI. Hot-Mix Asphalt Paving
VII. Cold-Laid Asphalt
Pavements
VIII. Soil Treatments and Seal
Coats
IX. Structural Design of Asphalt
Pavements
X. Miscellaneous Asphalt
Construction
XI. Portland Cement
XII. Production of Cements
XIII. Quality of Aggregates for Portland Cement Concrete
XIV. Strengths of Portland Cement Concrete
XV. Handling and Storage of Aggregates
XVI. Air-Entrained Portland Cement Concrete
XVII. Special Concrete Construction
XVIII. Lightweight Concrete
XIX. Test Methods for Concrete
XX. Designing and Mix for Portland Cement Concrete

STUDENT LEARNING OUTCOMES

Upon completion of this course, students will be able to do the following:

1. Discipline/Subject Area Specific Content Material

OUTCOME: demonstrate, through written assignments and examinations, the ability to design asphaltic concrete pavement mixes currently used in the industry

OUTCOME: identify the different types of asphalt concrete mixes currently used in the industry, through written assignments and examinations

OUTCOME: describe the required surface preparation needed to meet the current professional standards, through written assignments and examinations

OUTCOME: demonstrate a working knowledge, via presentation, of subgrade preparation, mixing in transit, and ready-mixed concrete, according to current professional standards

2. Creative, Critical, and Analytical Thinking

OUTCOME: describe and analyze the various asphalt concrete maintenance treatments and seal coats used in public works, through written assignments and examinations

OUTCOME: compare and contrast the methods to produce Portland Cement concrete by both the American Concrete Institute method and the Portland Concrete Cement Association method on a written examination

3. Communication (personal expression and information acquisition)

Information competency

OUTCOME: compare and contrast, through written assignments, the various aggregate products and their grades, as required in the Public Works industry

OBJECTIVES

1. Understand the design of asphaltic concrete mixes using both the Marshall and the Hveen method

explain the field of asphalt technology and construction

pass a comprehensive exam concerning the subject matter

identify various aggregate products and their grades

list the steps in surface preparation that meet the needs of code requirements

identify various surface treatments and seal coats

list methods to produce Portland Cement concrete by both the American Concrete
Institute method and the Portland Concrete Cement Association method

identify various aggregate products, cements and additives

demonstrate a working knowledge of subgrade preparation, mixing in transit and ready-mixed concrete that will meet the needs of the industry

METHODS OF EVALUATION/ASSESSMENT

Typical classroom assessment techniques

Required assignments