COURSE OBJECTIVES & OUTCOMES  
COLLEGE OF SCIENCE & ENGINEERING

Department: CIVIL ENGINEERING  
Course Number: CE 4437  
Course Name: GEOTECHNICAL ENGINEERING LABORATORY

Objective 1) PROVIDE CIVIL ENGINEERING STUDENTS WITH THE BASIC KNOWLEDGE TO CARRY OUT FIELD INVESTIGATIONS AND TO IDENTIFY SOILS IN GEOTECHNICAL ENGINEERING PRACTICE.

Outcomes

1. KNOWLEDGE OF SITE SPECIFIC FIELD INVESTIGATIONS INCLUDING COLLECTION OF SOIL SAMPLES FOR TESTING AND OBSERVATION OF SOIL BEHAVIOR/ BUILDING DAMAGE.
2. BE ABLE TO IDENTIFY AND CLASSIFY SOIL BASED ON STANDARD GEOTECHNICAL ENGINEERING PRACTICE.
3. BE ABLE TO PERFORM LABORATORY COMPACTION AND IN-PLACE DENSITY TESTS FOR FILLED QUALITY CONTROL.

Assignments that demonstrate accomplishment of this outcome:

1. FIELD TRIPS TO STUDY TYPICAL SOIL EXPOSURES, COLLECT SOIL SAMPLES AND OBSERVE BUILDING PERFORMANCE IN POCATELLO AREA.
2. STUDENTS PERFORM VISUAL-MANUAL AND WASHED GRADATION/ ATTERBERG LIMIT TESTS TO IDENTIFY AND CLASSIFY SOILS. INSTRUCTOR EVALUATION: STUDENTS MUST SUBMIT LABORATORY TEST REPORTS THAT SUMMARIZE TEST PROCEDURES, TEST RESULTS AND SOIL CLASSIFICATION.
3. STUDENTS PERFORM FIELD DENSITY TESTS, COLLECTED BUCKET SAMPLES AND CARRY OUT LABORATORY COMPACTION TESTS. INSTRUCTOR EVALUATION: STUDENTS MUST SUBMIT LABORATORY TEST REPORTS THAT SUMMARIZE TEST PROCEDURES, TEST RESULTS AND SOIL UNIT WEIGHT/ COMPACTION CHARACTERISTICS.

Objective 2) EDUCATE CIVIL ENGINEERING STUDENTS IN PERFORMING AND INTERPRETATING LABORATORY TESTS FOR EVALUATING SUBGRADE PERFORMANCE AND FOR PAVEMENT DESIGN.

Outcomes

1. BE ABLE TO PERFORM AND EVALUATE UNSOAKED AND SOAKED CALIFORNIA BEARING RATIO (CBR) TESTS USED TO ESTIMATE SUBGRADE BEHAVIOR DURING CONSTRUCTION AND BENEATH PERMANENT STRUCTURES.
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Assignments that demonstrate accomplishment of this outcome:

1. STUDENTS PERFORM CBR TESTS ON LOCAL SOILS TO DETERMINE SUBGRADE PROPERTIES NEEDED FOR TEMPORARY AND PERMANENT ROADWAYS. INSTRUCTOR EVALUATION: STUDENTS MUST SUBMIT LABORATORY TEST REPORTS THAT SUMMARIZE TEST PROCEDURES, TEST RESULTS AND SOIL BEARING PROPERTIES.

Objective 3) KNOWLEDGE OF AND ABILITY TO PERFORM LABORATORY TESTS NEEDED TO DETERMINE SOIL DESIGN PARAMETERS.

Outcome

1. BE ABLE TO PERFORM AND INTERPRET DIRECT SHEAR TESTS AND ESTIMATE SHEAR STRENGTH PARAMETERS,
2. BE ABLE TO CONDUCT AND ESTIMATE SHEAR STRENGTH OF SOILS IN UNCONFINED COMPRESSION.
3. BE ABLE TO PERFORM AND ANALYZE CONSTANT HEAD PERMEABILITY TESTS.
4. BE ABLE TO CONDUCT ONE-DIMENSIONAL COMPRESSION TESTS AND ESTIMATE SETTLEMENT PARAMETERS.

Assignments that demonstrate accomplishment of this outcome:

1. STUDENTS PERFORM ALL ENGINEERING DESIGN PARAMETER TESTS: WITH GUIDENCE, SET UP AND CARRY OUT BATTERY OF TESTS.
2. SUBMIT TEST RESULTS AND ANALYSIS FOR PERFORMANCE EVALUATION BY INSTRUCTOR.

Objective 4) ABILITY TO DESIGN AND CONDUCT EXPERIMENTS AS WELL AS ANALYZE AND INTERPRET DATA.

Outcome

1. BE ABLE TO DEVELOP AND IMPLEMENT LABORATORY PROCEDURES TO TEST GEOTECHNICAL ENGINEERING CONCEPT(S).
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Assignments that demonstrate accomplishment of this outcome:

1. STUDENTS DESIGN LABATORY TESTS TO VALIDATE SPECIFIC CONCEPTS IN
   GEOTECHNICAL ENGINEERING PRACTICE.
2. SUBMIT TEST RESULTS AND ANALYSIS FOR PERFORMANCE EVALUATION BY
   INSTRUCTOR.