Course Number & Name: CET 211 Surveying I

Credit Hours: 3.0  Contact Hours: 5.0  Lecture: 2.0  Lab: 3.0  Other: N/A

Prerequisites: None

Co-requisites: MTH 114  Concurrent Courses: None

Course Outline Revision Date: Fall 2010

Course Description: This is an introductory course that includes the use, care and adjustment of modern digital surveying instruments, the measurement of distance and difference in elevation, angles, directions, lines and grades. Other topics covered include the theory of measurement and errors, traversing and area computation. Field exercises are included to complement lecture topics.

Course Goals: Upon successful completion of this course, students should be able to do the following:

1. demonstrate proper handling and utilization of basic surveying tools and instruments;
2. read and interpret civil engineering plans drawn to scale and involving topography and section profiles;
3. perform a closed loop level run and traverse, including taking field notes and reduction of field notes;
4. perform a topographic survey, including taking field notes and reduction of field notes;
5. effectively work in a team environment, prepare a report based on actual field data generated from field exercises and present the report orally.

Measurable Course Performance Objectives (MPOs): Upon successful completion of this course, students should specifically be able to do the following:

1. Demonstrate proper handling and utilization of basic surveying tools and instruments:
   1.1 set-up and utilize surveying instruments and tools;
   1.2 obtain and record information accurately;
   1.3 perform error adjustments to compensate for weather conditions; and
   1.4 effectively work as a team in the field as well as to coordinate for the preparation of reports and presentations
Measurable Course Performance Objectives (MPOs) (continued):

2. Read and interpret civil engineering plans drawn to scale and involving topography and section profiles:
   2.1 use an engineering scale and obtain accurate dimensions;
   2.2 evaluate actual field conditions by interpreting engineering drawings; and
   2.3 interpret ground elevations utilizing the concept of contours and spot elevations

3. Perform a closed loop level run and traverse, including taking field notes and reduction of field notes:
   3.1 describe the steps taken in preparation for level and traverse runs;
   3.2 correctly read horizontal and vertical angles;
   3.3 record field notes and information accurately;
   3.4 perform field note reduction; and
   3.5 identify field errors and perform appropriate field checking and corrections

4. Perform a topographic survey, including taking field notes and reduction of field notes:
   4.1 obtain ground elevations, utilizing a benchmark;
   4.2 record field notes and information accurately;
   4.3 perform field note reduction; and
   4.4 interpret ground elevations utilizing the concept of contours and spot elevations

5. Effectively work in a team environment, prepare a report based on actual field data generated from field exercises and present the report orally:
   5.1 coordinate the tasks of each team member;
   5.2 reduce the field data in a comprehensive format and prepare a report;
   5.3 prepare an effective PowerPoint presentation; and
   5.4 present the report working together as a team

Methods of Instruction: Instruction will consist of lectures, field exercises and a term project with an oral presentation.

Outcomes Assessment: Test and exam questions are blueprinted to course objectives. Checklist rubrics are used to evaluate field exercises and the term project and oral presentation for the presence of course objectives. Data is collected and analyzed to determine the level of student performance on these assessment instruments in regards to meeting course objectives. The results of this data analysis are used to guide necessary pedagogical and/or curricular revisions.
**Course Requirements:** All students are required to:

1. Maintain regular attendance.
2. Complete homework assignments.
3. Sit for all quizzes, tests, and exams.
4. Read all assigned textbook pages.
5. Participate in classroom discussion.
6. Complete the assigned term project with oral presentation.

**Methods of Evaluation:** Final course grades will be computed as follows:

<table>
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<tr>
<th>Grading Components</th>
<th>% of final course grade</th>
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<tbody>
<tr>
<td>Homework, quizzes and class participation</td>
<td>10 – 15%</td>
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<tr>
<td>A perusal of homework and quizzes as well as class discussion will indicate the extent to which students master course objectives.</td>
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<tr>
<td>2 or more Tests (dates specified by the instructor)</td>
<td>30 – 40%</td>
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<td>Tests will show evidence of the extent to which students meet course objectives, including but not limited to identifying and applying concepts, analyzing and solving problems, estimating and interpreting results and stating appropriate conclusions using correct terminology.</td>
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<tr>
<td>Term Project &amp; Oral Presentation</td>
<td>10 – 15%</td>
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<td>The purpose of the Term Project and Oral Presentation is to promote teamwork and information sharing, as well as planning and executing an effective oral presentation</td>
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<tr>
<td>Field Exercises</td>
<td>15 – 20%</td>
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<td>Field exercises provide the students the opportunity to work in a team environment and apply in the field, with hands-on applications, the principles and techniques taught during the lectures. All exercises are designed to enhance the learning of course objectives.</td>
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<tr>
<td>Final Exam (comprehensive)</td>
<td>15 – 20%</td>
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<td>The same objectives apply as with tests, but it is anticipated that students will provide increased evidence of synthesizing a combination of concepts.</td>
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**NOTE:** The instructor will provide specific weights, which lie in the above-given ranges, for each of the grading components at the beginning of the semester.
**Academic Integrity:** Dishonesty disrupts the search for truth that is inherent in the learning process and so devalues the purpose and the mission of the College. Academic dishonesty includes, but is not limited to, the following:

- plagiarism – the failure to acknowledge another writer’s words or ideas or to give proper credit to sources of information;
- cheating – knowingly obtaining or giving unauthorized information on any test/exam or any other academic assignment;
- interference – any interruption of the academic process that prevents others from the proper engagement in learning or teaching; and
- fraud – any act or instance of willful deceit or trickery.

Violations of academic integrity will be dealt with by imposing appropriate sanctions. Sanctions for acts of academic dishonesty could include the resubmission of an assignment, failure of the test/exam, failure in the course, probation, suspension from the College, and even expulsion from the College.

**Student Code of Conduct:** All students are expected to conduct themselves as responsible and considerate adults who respect the rights of others. Disruptive behavior will not be tolerated. All students are also expected to attend and be on time for all class meetings. No cell phones or similar electronic devices are permitted in class. Please refer to the Essex County College student handbook, *Lifeline*, for more specific information about the College’s Code of Conduct and attendance requirements.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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</table>
| 1    | Introduction, measurement units, accuracy, precision  
Field Exercise*: Orientation |
| 2    | Horizontal measurement, taping, elevations  
Field Exercise*: Distance measurement |
| 3    | Leveling – differential & trigonometric leveling  
Field Exercise*: Distance measurement (continued) |
| 4    | Leveling – balancing a level loop  
Field Exercise*: Leveling exercise |
| 5    | **Test #1**  
Field Exercise*: Leveling exercise (continued) |
| 6    | Measurement of angles  
Field Exercise*: Leveling exercise (continued) |
| 7    | Traverse – bearings, angle adjustment  
Field Exercise*: Leveling exercise (continued) |
| 8    | Traverse – compute and balance latitudes & departures  
Field Exercise*: Traverse |
| 9    | Traverse – coordinates, horizontal precision  
Field Exercise*: Traverse (continued) |
| 10   | **Test #2**  
Field Exercise*: Traverse (continued) |
| 11   | Topographic survey  
Field Exercise*: Topographic survey |
| 12   | Topographic survey (continued)  
Field Exercise*: Topographic survey (continued) |
| 13   | Description and use of transit/theodolite  
Field Exercise*: Topographic map |
| 14   | Area computation  
Field Exercise*: Topographic map (continued) |
| 15   | **Comprehensive Final Exam** |

*Note:* Since the field exercises are weather-dependent, the above weekly schedule may be adjusted as necessary. Also, the field exercises are in addition to the lectures, as is indicated above.