ESSEX COUNTY COLLEGE
Engineering Technologies and Computer Sciences Division
CET 212 – Surveying II
Course Outline

Course Number & Name: CET 212 Surveying II

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

Prerequisites: Grade of "C" or better in CET 211

Co-requisites: N/A  Concurrent Courses: None

Course Outline Revision Date: Fall 2010

Course Description: This is a continuation of CET 211 and covers the elements of horizontal, vertical and compound curves, cross-sectioning and earthwork computations. Other topics covered include the essentials of boundary surveys, coordinates, control surveys, construction surveys and state plane coordinates. Field exercises and computer applications are included to compliment lecture topics.

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

1. compute coordinates using bearings and distances;
2. compute horizontal curves by the deflection method and the total chord method;
3. compute vertical curves, both equal and unequal tangent;
4. compute earthwork volumes; and
5. compute stake data for construction stake-out.

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

1. Compute coordinates using bearings and distances:
   1.1 adjust and balance interior angles of a closed traverse;
   1.2 balance latitudes and departures;
   1.3 adjust course length and bearings; and
   1.4 compute coordinates

2. Compute horizontal curves by the deflection method and the total chord method:
   2.1 compute circular curve stationing;
   2.2 compute deflection angles and chords; and
   2.3 perform field layout of circular curve by deflection angles

prepared by A Dimopoulos, Fall 2010
Measurable Course Performance Objectives (MPOs) (continued):

3. Compute vertical curves, both equal and unequal tangent:
   3.1 compute crest and sag vertical parabolic curves;
   3.2 compute vertical curves using the tangent offset equation;
   3.3 compute high or low point on a vertical curve; and
   3.4 compute stake-out data for a vertical parabolic curve

4. Compute earthwork volumes:
   4.1 use appropriate methods to calculate volume measurement;
   4.2 calculate volumes by the cross section and average end area method; and
   4.3 calculate volumes by the cell method

5. Compute stake data for construction stake-out:
   5.1 use proficiently specialized equipment for construction stake-out;
   5.2 compute horizontal and vertical control data for construction stake-out; and
   5.3 evaluate stake-out data of horizontal and vertical curves

Methods of Instruction: Instruction will consist of lectures, homework, spreadsheet creation, and field exercises.

Outcomes Assessment: Test and exam questions are blueprinted to course objectives. Checklist rubrics are used to evaluate field exercises 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 and all field exercises.
Methods of Evaluation: Final course grades will be computed as follows:

<table>
<thead>
<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>• 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 in the lecture portion of the course and related to 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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| 1    | Review of coordinates  
Field Exercise*: Traverse |
| 2    | Horizontal curves  
Field Exercises*: Traverse (continued), Topography Survey |
| 3    | Horizontal curves (continued)  
Field Exercise*: Topography Survey (continued) |
| 4    | Vertical curves  
Field Exercise*: Laying Out a Point |
| 5    | Vertical curves (continued)  
Field Exercise*: Laying Out a Point (continued) |
| 6    | Test #1  
Field Exercise*: Laying Out a Point (continued) |
| 7    | Boundary surveys  
Field Exercise*: Laying Out a Point (continued) |
| 8    | Boundary surveys (continued)  
Field Exercise*: Plotting Topography by Computer |
| 9    | State plane coordinates  
Field Exercise*: Plotting Topography by Computer (continued) |
| 10   | Test #2  
Field Exercise*: Roadway Design |
| 11   | Construction surveys  
Field Exercise*: Roadway Design (continued) |
| 12   | Construction surveys (continued)  
Field Exercise*: Roadway Design (continued) |
| 13   | Volume computations  
Field Exercise*: Roadway Stake-out |
| 14   | Global positioning systems, photogrametry  
Field Exercise*: Roadway Stake-out (continued) |
| 15   | 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.