Course Description: Practical application of the theory presented in CVE 211 through field problems. Course will involve measurement of horizontal distances, horizontal angles, establishing elevations, conducting location surveys, and construction staking (sewers and highway curves).

Text: Lab Notes and text used in CVE 211. Students are required to purchase a set of Lab Notes from the instructor.

Instructor: Stephen F. Duffy PhD, PE
Professor of Civil Engineering
CSU Office: Stilwell Hall 114
Office Hours: by appointment

Grades: Grades will be determined by the quality of your field notes, your traverse map and your attitude during lab. The following weight is assigned to each category:

- Traverse Calculations: 15%
- Field notes: 35%
- Traverse map: 35%
- Instructor evaluation: 15%

Attendance is mandatory. Each unexcused absence will result in lowering the student's grade by 10%. The student must inform the instructor prior to the lab as to the reasons why the student will miss the lab. Grades will be assigned on the following scale: 92.5-100 $\rightarrow A$; 90-92.5 $\rightarrow -$A; 87.5-90 $\rightarrow -$B; 82.5-87.5 $\rightarrow -$B; 80-82.5 $\rightarrow -$B; 77.5-80 $\rightarrow -$C+; 70-77.5 $\rightarrow -$C; 60-70 $\rightarrow -$D Below 60 $\rightarrow F$.

Weather: Unfortunately weather delays may occur. The student must appear for the lab and the instructor will make the determination when the lab starts, or if the lab will be canceled.
**COURSE OUTLINE:**

<table>
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<tr>
<th>Week</th>
<th>Field Lab</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
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<td>Organization of field crews</td>
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<tr>
<td>2</td>
<td>1</td>
<td>Measuring distances &amp; angles with an EDMI</td>
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<tr>
<td>3</td>
<td>2</td>
<td>Establishing a base line for control; Using data collectors</td>
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<td>4</td>
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<td>CAD Lab</td>
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<tr>
<td>5</td>
<td>3</td>
<td>Measuring distances &amp; angles with a steel tape</td>
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<td>6</td>
<td>4</td>
<td>Location survey</td>
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<td>7</td>
<td>5</td>
<td>Differential leveling</td>
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<td>8</td>
<td>6</td>
<td>Distances using stadia methods</td>
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<td>10</td>
<td>7</td>
<td>Horizontal &amp; vertical angle measurement with a theodolite</td>
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<td>11</td>
<td>8</td>
<td>Property abstract</td>
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<td>12</td>
<td>9</td>
<td>Horizontal curve - field staking</td>
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<td>13</td>
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<td>Construction staking</td>
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<td>14</td>
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<td>CAD Lab</td>
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<td>15</td>
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<td>CAD Lab</td>
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**NOTE THE FOLLOWING CAREFULLY**

1. For each lab the student must review relevant information regarding the format of the field notes found in each lab abstract and the text (see the appendices) used for CVE 211.

2. Field books must contain the following:
   - Table of contents - indicates page numbers for corresponding lab; indicates whether the lab was conducted (note that the instructor must sign table of contents for those labs canceled due to inclement weather)
   - Data is placed on left pages, sketches & descriptions for each lab appear on the right page
   - Each page must be initialed by the student
   - Weather and equipment identification number for each lab
   Students buy the field book, personally identify the field book, and turn the field book over to the instructor at the end of the semester. Field books will be checked weekly to ensure the
student is keeping up to date records. One student in each crew will record data into a field book. Thus the other students in the field crew must copy pertinent information into their personal field books from the common field book prior to turning field books into the instructor at the end of each week.

3. Field books account for 35% of the grade for this class and are due at the conclusion of the last lab.

4. During the last several weeks of the semester each student is expected to spend time in the Fenn College CAD Lab developing a site map that contains the traverse and information obtained in the field. The traverse must be balanced and the calculations must be turned into the instructor one week after completing Lab #7. Calculations must include:
   - Bearings of each course relative to the baseline established in Lab #6
   - Balanced angles
   - Balanced latitudes and departures
   - Misclosure errors
   - Relative precision
The instructor will grade the calculations and return the calculations to the student in order to complete the site map described below.

5. The student must draw the map using either AutoCAD, MICROSTATION or any appropriate graphics software. On the finished traverse map the student must provide all of the following:
   - Distances for each course
   - Interior angles at each benchmark
   - Contour lines must be estimated and drawn
   - Map scale (preferably 1 inch = 30 feet)
   - North arrow (up on the page) and meridian information
   - Location of all details established in Lab #3
   - A symbol legend must be included
The traverse map must be drawn on a 3 ft. by 2 ft. sheet of clear mylar, vellum, or sepia paper. The drawing must appear in black and white. The instructor will be available to assist students on Tuesday of each week.