Forest Surveying  
FE 208 Syllabus

Instructor: Jim Kiser  
Office: Peavy 271  
Phone: 737 - 2192  
Office Hours: Open  
Email: jim.kiser@oregonstate.edu

Course Credits: This course combines approximately 90 hours of instruction and assignments for 4 credits. The course combines approximately 3 hours of lecture time per week with approximately 4 hours per week of laboratory/homework exercises.

Prerequisite: Trigonometry (Math 112), A statistics course is strongly recommended prior to taking this course.

Course Format:  
Sec 01 Lecture MWF 8-8:50 AM  
Sec 02 Lecture MWF 9-9:50 AM  
Lab M,T,TH,F 12:00-4:00 PM

Course Website: http://jimkiser0.wixsite.com/jimkiser

Required Text: Kiser, J. 2010. Surveying for Forestry and the Natural Resources. 2nd ed. This is a field and class text that is focused on surveying practice in the forest environment. This is a hands-on text that will be used in several other forestry classes.

Optional Text: Ghilani, Charles. D. 2017. Elementary Surveying, An Introduction to Geomatics. 15th ed. This is a classic surveying text and will be a very useful reference in your professional career. The book is available in hardcover for approximately $197.37 from Amazon.com.

Additional Reading: Buckner, Ben. 1997. The Nature of Measurement. This is a 12 part series that will be made available.

Materials: Hardhat – required (a hardhat will be made available to you if you don’t have one)  
Handheld scientific calculator – required (bring to all tests). Suggest the TI30XA  
Transit style field notebook (1) – required  
Level style field notebook (1) – required  
FE 208 toolkit (avail. In bookstore) – optional  
Field boots - required  
Field survey vest - optional
The Sequence of Surveying and Measurements Courses:
FE 208 is one course from an integrated sequence of three courses in Forest Surveying and Measurements (FE 208, FE 209, FE 310). FE 208 is an introduction to the theory and practice of surveying methods and measurements as applied to the specifics of forestry problems and their solutions. FE 208 provides fundamental instruction for surveying and field measurements. FE 208 is also intended to prepare forest engineering students for Forest Route Surveying, Control Surveying (CE 463), Property Surveying (CE469), and Survey Law (CE 465). This sequence of courses is designed to prepare students for the Fundamentals of Land Surveying exam that is necessary to become a Professional Land Surveyor.

Course Goals:
There are two primary goals for this course. The first is to learn and become proficient in basic forest survey techniques including surveying fundamentals, field notes, distance and angle measurements, and leveling techniques. The second goal, which is consistent throughout all Forest Surveying and Measurement courses, is the development and application of good professional practices.

Course Objectives:
The course objectives are built around lecture and lab combinations. Material presented in lecture will focus on the theory of surveying measurements and the application of surveying techniques to forestry related problems. The field labs will focus on the hands-on use of equipment, proper field measurement techniques, proper field note keeping, and the application of classroom material in forest field conditions.

Students who successful complete this course will be able to:

- Understand and apply the theory of measurement errors and be able to calculate uncertainty in survey measurements.
- Successfully solve surveying problems of horizontal distance, vertical distance, and angular measurement.
- Successfully solve Survey problems of adjustments to horizontal and vertical measurements.
- Understand the principles of map creation and projection and use maps to successfully solve problems of measurements and legal descriptions.
- Understand the concepts and development of the Public Land Survey System in the United States and Oregon, and use these concepts to successfully analyze and solve problems of division of public lands.
- Become proficient in various field survey techniques and field note-keeping.
- Understand the concept of survey order.
**Students with Disabilities**
Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

**Oregon State University policy on Student Conduct**
Students are expected to uphold the Academic Honor Code published by their respective Academic Unit. The code is based on the assumption that all persons must treat one another with dignity and respect in order for scholarship to thrive, (2) Students are also expected to follow the academic and professional standards of the academic units, and (3) Choosing to join the Oregon State University community obligates each member to a code of responsible behavior.

**College of Forestry Code of Professional Conduct**
[http://studentservices.forestry.oregonstate.edu/college-forestry-code-professional-conduct](http://studentservices.forestry.oregonstate.edu/college-forestry-code-professional-conduct)  
The College of Forestry is a community of faculty, staff, students, and visitors that stretches across all spectrums. Every member of the College community is responsible for conduct that creates, promotes, and maintains a learning and work environment that is open to and welcomes all persons. As a community, we embrace each member through the acknowledgement, honoring, and celebration of our commonalities and our differences. The foundation for maintaining this environment requires that all persons must treat all others with dignity and respect at all times. The College fully supports the mission and goals of Oregon State University and affirms its support of the University policy against discrimination ([http://oregonstate.edu/dept/affact/policy/discrimination.html](http://oregonstate.edu/dept/affact/policy/discrimination.html)), as well as the University’s policies on honesty, ethics, and substance abuse (including alcohol) ([http://oregonstate.edu/admin/stucon/](http://oregonstate.edu/admin/stucon/)).

**Course Policies**
1. All assignments are due by the time and date assigned.
2. To receive credit, assignments must be turned in on time. **Late assignments will not be accepted except by permission of the instructor.**
3. All work must be neat, legible, and complete. All steps should be shown. Sample calculations and a summary table may be used to illustrate repetitive calculations. Use words to explain the computations where necessary. Use sketches and drawings where required or helpful. Incomplete, undocumented work is unacceptable.
4. All figures, drawings, and tables should be titled.
5. There will be no make-up exams or quizzes except by permission of the instructor.
6. Any requests for deviations in the course policies, schedule, or deadlines must be made in writing to the instructor. These requests should be made in the form of a typed business style letter that clearly states and defends your request. E-mail is acceptable but should be confirmed as having been received.

Grading:

Final grades for the course will be based on the planned following:

<table>
<thead>
<tr>
<th>Item</th>
<th>Total points</th>
<th>% of total</th>
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<tbody>
<tr>
<td>Labs (8)</td>
<td>130</td>
<td>23.2</td>
</tr>
<tr>
<td>Lab Final</td>
<td>50</td>
<td>8.9</td>
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<tr>
<td>Homework (5)</td>
<td>80</td>
<td>14.3</td>
</tr>
<tr>
<td>Midterm Exams (2)</td>
<td>200</td>
<td>35.7</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
<td>17.9</td>
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<tr>
<td>Totals</td>
<td>560</td>
<td>100</td>
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Letter grades will be based on the following:

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>% of total</th>
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<tbody>
<tr>
<td>A</td>
<td>90</td>
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<tr>
<td>B</td>
<td>80</td>
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<tr>
<td>C</td>
<td>70</td>
</tr>
<tr>
<td>D</td>
<td>60</td>
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<tr>
<td>F</td>
<td>&lt; 60</td>
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Plus and minus grades will be given where appropriate.
# FE 208 Planned Schedule

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Lecture:</th>
<th>H1 Statistics homework (10 pts)</th>
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</thead>
</table>
|        | Class Introduction | *L1 What is Surveying*  
*L2 Errors in Measurements*  
*L3 Error statistics* |
| Homework | Introduction, ABET, Learning Styles, Field Notes, Pacing (10 pts) |
| Lab:     | Kiser, pp. 1-27  
Ghilani & Wolf, pp. 1 – 20 and 45 - 65 |
| Reading: | Buckner parts 1 through 4  
Pafford, pp 1-11, Scan through the example notes |

<table>
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<tr>
<th>Week 2</th>
<th>Lecture:</th>
<th>H2 Compass homework problems (10 pts)</th>
</tr>
</thead>
</table>
|        | L4 Fundamentals of measurements  
L5 Survey measurements-horizontal and vertical  
L6 Compass theory |
| Homework | Horizontal measurements lab Pacing  
*(McDonald Forest)* (20 pts) |
| Lab:     | Kiser, pp. 29 – 53 and 121-133  
Ghilani & Wolf, pp. 131 - 147 and 179 - 187 |
| Reading: | Buckner parts 6 through 9 and 12 |

<table>
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<tr>
<th>Week 3</th>
<th>Lecture:</th>
<th>H3 Traverse Closure problem (20 points)</th>
</tr>
</thead>
</table>
|        | L7 Traversing  
L8 Traverse adjustments  
L9 Traverse adjustments continued |
| Homework | Area Layout – Hand compass  
*(McDonald Forest)* (20 pts) |
| Lab:     | Kiser, pp. 53 – 60  
Ghilani & Wolf, pp. 231 – 251 and 251 - 261 |
| Week 4                                                                 | Lecture:          | Midterm 1 review - Monday  
|                                                                      |                  | Midterm 1 - Wednesday  
|                                                                      |                  | L10 Angles and Bearings  
| H3 due Wednesday at lecture                                         | Homework:        | H4 Traverse Closure problem (20 pts)  
| Lab 3 writeup due at beginning of Lab 4                             | Lab:             | Area layout with staff compass *(McDonald Forest Rusty Axle Traverse)* (20 pts)  
|                                                                      |                  | EXAM Midterm 1 - Wednesday  
| 140 points                                                           | Reading:         | Kiser pages 53-56 review  
|                                                                      |                  | Ghilani & Wolf, pp. 169 - 179  

| Week 5                                                                 | Lecture:          | L11 Angles and bearings continued  
|                                                                      |                  | L12 Leveling  
|                                                                      |                  | L13 Differential leveling  
| H4 due Friday at lecture                                             | Lab:             | Profile leveling *(McDonald Forest)* (20 pts)  
| Lab 4 writeup due at beginning of Lab 5                              | Reading          | Kiser pages 61 - 76  
|                                                                      |                  | Ghilani & Wolf, pp. 169 – 179 and 73 - 125  
| 40 points                                                            |                  |  

| Week 6                                                                 | Lecture:          | L14 Leveling errors  
|                                                                      |                  | L15 Leveling adjustments  
|                                                                      |                  | L16 Traverse adjustments – Review of L8-9  
| Lab 5 writeup due at beginning of Lab 6                              | Homework:        | H5 Traverse Closure problem (20 pts)  
|                                                                      | Lab:             | Closed traverse differential leveling *(McDonald Forest)* (20 pts)  
|                                                                      | Reading          | Kiser pages 61 - 76  
|                                                                      |                  | Ghilani & Wolf, pp. 106 - 125  
| 20 points                                                            |                  |  

| Week 7                                                                 | Lecture:          | L17 Area computation  
|                                                                      |                  | L18 Topographic mapping/contours  
|                                                                      |                  | Midterm 2 review - Friday  
| H5 due Friday at lecture                                             | Lab:             | Putting it all together (20 pts)  
| Lab 6 writeup due at beginning of Lab 7                              | Reading          | Ghilani & Wolf, pp. 309 – 328 and 479 – 485  
| 40 points                                                            |                  |  

6
| Week 8 | Lecture: | Midterm 2 – Monday  
L19 Public Land Survey System  
L20 Control Surveys |
| Lab 7 writeup due at beginning of Lab 8 | Lab: | Advanced Survey Equipment, Digital total station *(McDonald Forest)* (10 pts) |
| | Exam: | Midterm 2 (Monday) |
| | Reading: | Kiser pages 265 - 274  
Ghilani & Wolf, pp. 659 – 680 547 - 559 |
| | 110 points | |

| Week 9 | Lecture: | L21 Maps and mapping  
L22 Coordinate systems |
| Lab 8 writeup due Wednesday at lecture | Lab: | No Lab this week - Thanksgiving Holiday |
| | Reading: | Kiser pages 135 - 150  
Ghilani & Wolf, pp. 503 – 526 and 589 - 627 |
| Week 10 | Lecture: | 1.23 Starting to put it all together  
1.24 Continuing to put it all together  
Final exam review |
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<tbody>
<tr>
<td>Lab:</td>
<td>No lab this week</td>
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<tr>
<td>Reading:</td>
<td>No reading this week</td>
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</tbody>
</table>
| 50 points | FINAL EXAM | 8 am class – Monday 12/4 9:30 am  
9 am class – Thursday 12/7 2:00 PM |