Course Description
In this course students will learn different measurement techniques and the instrumentation used in the atmospheric sciences. The course will consist of lecture, laboratory and field work. The course will introduce students to the techniques of instrument calibration, deployment, and data acquisition. Students will become familiar with upper-air sounding techniques, remote sensing instruments such as SODAR and Radar, air-quality gas analyzers, and turbulence measurements from sonic anemometry.

Course Goals and Student Learning Objectives
The primary goals of this course are the development of an understanding of

1. different meteorological instrument types and their uses
2. how to calibrate and install instrumentation for laboratory and field studies
3. data collection and analysis from a variety of instrumentation types

Course Content Learning Outcomes
Upon successful completion of this course, students will be able to:

1. select the appropriate instrumentation for a variety of atmospheric measurements.
2. calibrate and install instrumentation for field studies
3. analyze instrument performance and data quality and write scientific field reports.

Required Texts/Readings
2. CR1000 datalogger manual (www.campbellsci.com)
3. Supplemental readings

Lectures notes
The format of the lectures generally will include a combination of powerpoint slides, overheads, and white board notes. The lectures will be available for download, in pdf format, on the course website after each class. You are expected to take notes during the lectures and supplement your notes with the lecture powerpoint view slides.
The laboratory portion of the course will require you to keep an organized binder for your laboratory notes, including your reports and any documentation needed that is not included in the textbook, i.e., instrument manuals, etc.

**Assessment**

Assessment is designed to determine how well students have achieved the goals of the learning objectives and thus form an important component to the course. Each student will be assessed from a combination of assignments, exams, and research project.

<table>
<thead>
<tr>
<th>Assignments (Lab reports, HW, quizzes)</th>
<th>30%</th>
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</thead>
<tbody>
<tr>
<td>Lab/Field Book Organization</td>
<td>5%</td>
</tr>
<tr>
<td>Midterm Exam 1</td>
<td>20%</td>
</tr>
<tr>
<td>Field Project Report (10 pgs)</td>
<td>15%</td>
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<tr>
<td>Final Exam (written)</td>
<td>15%</td>
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<tr>
<td>Final Exam (practical)</td>
<td>15%</td>
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<td><strong>Total</strong></td>
<td><strong>100 %</strong></td>
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**Grading Scale:**

A+ 97 - 100  
A  94 - 96  
A- 90 - 93  
B+ 87 - 89  
B  84 - 86  
B- 80 - 83  
C+ 77 - 79  
C  74 - 76  
C- 70 - 73  
D+ 67 - 69  
D  65 - 66  
D- 60 - 64  
F  0 - 59  

Arrangements for missing a midterm due to medical reasons (a medical certificate will be required) will need to be arranged privately. However, this does not apply to the Final Exam.

**Incompletes:**

An "incomplete" will be given for the course only under the following conditions:

1. At least 60% of the course work has been completed and
2. Unexpected circumstances prevent the completion of the remaining work.

An incomplete will not be given to circumvent rules concerning the dropping of courses!

**Classroom protocol**

**Cell phones and Laptop computers:**

Students and Instructor will please turn their cell phones off or put them on vibrate mode while in class. Please do not answer your phones in class. Students whose phones disrupt the course and do not stop when requested by the instructor will be referred to the Judicial Affairs Officer of the University. Laptop computers may only be used for taking notes in class, any abuse of laptop use in class will result in banning their use in the classroom for all students.

**Punctuality, etc.:**

Please make every effort to arrive on time. Please do not start making preparations to leave (e.g., closing notebooks) prior to the scheduled end of the class. Please inform me if you need to leave class early; try to take a seat near the front of the classroom to avoid disruption of the class as you leave.
Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Information on add/drops is available at [http://info.sjsu.edu/web-dbgen/narr/soc-fall/rec-324.html](http://info.sjsu.edu/web-dbgen/narr/soc-fall/rec-324.html). Information about late drop is available at [http://www.sjsu.edu/sac/advising/latedrops/policy/](http://www.sjsu.edu/sac/advising/latedrops/policy). Students should be aware of the current deadlines and penalties for adding and dropping classes.

University Policies

Academic Integrity

Students should know that the University’s [Academic Integrity Policy is available at http://www.sa.sjsu.edu/download/judicialaffairs/Academic_Integrity_PolicyS07-2.pdf](http://www.sa.sjsu.edu/download/judicialaffairs/Academic_Integrity_PolicyS07-2.pdf). Your own commitment to learning, as evidenced by your enrollment at San Jose State University and the University’s integrity policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The website for [Student Conduct and Ethical Development is available at http://www.sa.sjsu.edu/judicial_affairs/index.html](http://www.sa.sjsu.edu/judicial_affairs/index.html).

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with the DRC (Disability Resource Center) to establish a record of their disability.

The Field Project

The field project will be a two-day event that will be conducted at a local park with camping facilities. The project will be focused on the following:

1. designing a field experiment
2. preparing and deploying instruments at field site
3. conducting overnight operations
4. break down of equipment
5. analysis of data
6. writing of report

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<thead>
<tr>
<th>Papers/Exams</th>
<th>Date</th>
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<tbody>
<tr>
<td>Midterm Exam 1</td>
<td>19 March or TBD</td>
</tr>
<tr>
<td>Field Experiment</td>
<td>17-19 April</td>
</tr>
<tr>
<td>Last day of classes</td>
<td>13 May</td>
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<tr>
<td>Final Project Due</td>
<td>17 May</td>
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<tr>
<td><strong>Final Exam Day</strong></td>
<td><strong>Thursday, May 19</strong></td>
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<td>Time: 0715-0930</td>
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**Tentative Course Topic List:**

1. **Instrument design and selection**
   - performance characteristics
   - sources of error
   - calibration
   - exposure

2. **System integration**
   - instrument platforms: airborne, towers, mobile ground
   - communications: serial, wireless, satellite
   - power supplies/sources: ac, dc, solar power

3. **Instrumentation**
   - Barometry
   - Thermometry
     - aspirated and non-aspirated
     - fine-wire thermocouples
   - Hygrometry
   - Anemometry
     - mechanical anemometers
     - sonic anemometers
   - Radiosonde/Weather balloon soundings

4. **Remote Sensing**
   - SODAR
   - RADAR
   - LIDAR

5. **Field Methods**
   - site selection
   - using a compass
   - using GPS
   - making instrument site maps
   - installation of instruments
   - field experiment design