Course Description
This course will introduce the student to meteorological phenomena associated with mountain environments. The course will emphasize the physical mechanisms associated with those phenomena and will include theoretical treatment as well as conceptual models. The course will also serve as an advanced survey of many atmospheric processes that occur in mountains including mountain and valley wind systems, mountain wave dynamics, boundary layer evolution, precipitation processes and snow and avalanche mechanics.

Course Goals and Student Learning Objectives

Learning objectives

The primary goals of this course are the development of an understanding of

1. the role mountains have on climate and weather
2. the physical mechanisms that drive micro and mesoscale wind and precipitation processes in mountainous terrain.
3. the surface energy budgets that lead to mountain snow pack, glaciers, and water resources and the role of these processes in snow pack stability.

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

- recognize characteristic mountain weather patterns and events
- anticipate mountain weather evolution and behavior
- evaluate mountain weather impacts on snow pack behavior

Required Texts/Readings

Optional Texts
Mountain Weather and Climate (1992) Roger G. Barry

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 viewslides. It is important to keep an organized binder for your notes, powerpoint view slides and all other material that is handed out. Organization is key to being successful in any upper-division university course.
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, article review and a term paper. Assignments will include both in-class and take home components and will include problems and written responses. There will be two mid-term exams and a final exam. The final exam is comprehensive.

<table>
<thead>
<tr>
<th>Assignments: paper reviews, hw problems</th>
<th>20%</th>
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<tbody>
<tr>
<td>Midterm Exam 1</td>
<td>20%</td>
</tr>
<tr>
<td>Term Paper (10 pages)</td>
<td>25%</td>
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<tr>
<td>Research Presentation</td>
<td>15%</td>
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<tr>
<td>Final Exam</td>
<td>20%</td>
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<tr>
<td>Total</td>
<td>100%</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. Information about late drop is available at 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/judicial_affairs/Academic_Integrity_Policy_S07-2.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.

Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person’s ideas without giving proper credit) will result in a failing grade and sanctions by the
University. For this class, all assignments are to be completed by the individual student unless otherwise specified. If you would like to include in your assignment any material you have submitted, or plan to submit for another class, please note that SJSU’s Academic Policy F06-1 requires approval of instructors.

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.

Student Technology Resources
Computer labs for student use are available in the Academic Success Center located on the 1st floor of Clark Hall and on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include digital and VHS camcorders, VHS and Beta video players, 16 mm, slide, overhead, DVD, CD, and audiotape players, sound systems, wireless microphones, projection screens and monitors.

Learning Assistance Resource Center
The Learning Assistance Resource Center (LARC) is located in Room 600 in the Student Services Center. It is designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. The center provides support services, such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. The LARC website is located at http://www.sjsu.edu/larc/.

SJSU Writing Center
The SJSU Writing Center is located in Room 126 in Clark Hall. It is staffed by professional instructors and upper-division or graduate-level writing specialists from each of the seven SJSU colleges. Our writing specialists have met a rigorous GPA requirement, and they are well trained to assist all students at all levels within all disciplines to become better writers. The Writing Center website is located at http://www.sjsu.edu/writingcenter/about/staff/.

Tentative Course Topic List:

Mountain Climates
- energy balance in mountainous areas
  - large-scale effects of mountains on flow
  - mountain torques
  - climatology of major mountain ranges

II. Mountain Winds
Terrain forced flows
  a. Flow over mountains
  b. Mountain waves
  c. Flow around mountains
  d. Gap flows
Thermally-driven mountain winds
  a. Slope flows
  b. Mountain valley winds
    - topographic amplification factor
    - cold air pools
  c. Mountain-plain winds

Special Topics
Air pollution and dispersion in mountainous terrain
Fire weather and Smoke Management
Convection in mountains
Precipitation processes over mountains
Avalanche mechanics and snow dynamics
Snowpack and glacier runoff related to mountain energy balance