Syllabus

GSE-GEOG-WL-BIOL 767 Fire and Ecosystems

Meeting Times: Wednesdays @ 2:00 – 4:50 PM
Meeting Location: Wecota 100
Instructor: Professor Mark A. Cochrane, 115H Wecota, 688-5353,
mark.cochrane@sdstate.edu
Office Hours for Spring 2011: Tuesdays & Thursdays 2:00-3:30 PM; or by appointment

Course Objectives: The specific objectives of the course are to provide the student with:
1. A comprehensive understanding of how fuel, topography and weather influence fire behavior.
2. Detailed information on the tenets of fire ecology and how they relate to plant and animal individuals and populations.
3. Integrated treatment of fire behavior and ecosystems response so that community composition and ecosystem properties can be understood or predicted.
4. A synthetic view of how human land use, fire history and biophysical conditions lead to ecosystem development and change over time for regions of interest to the student.

Fire Weather by Schroeder and Buck. 1970. (I will provide this in pdf form as it is out of print).

Optional Texts: (a) Fire Ecology of Pacific Northwest Forests by James K. Agee. 1993. Island Press. This is an excellent overview of plant related fire ecology especially for those interested coniferous forests. (b) Fire Vegetation and Dynamics by Edward A. Johnson. 1992. Cambridge University Press. This is an excellent short book on plant related fire ecology with particular emphasis on boreal forests. (c) Introduction to Wildland Fire by Stephen J. Pyne, P.L. Andrews and R.D. Laven. 1996. John Wiley & Sons, Inc. This book is a great overview of fire behavior, fire management and fire ecology principles, but it will cost you an arm and a leg, so acquire this only if you are planning on having a professional fire-related library!

Course Grade: Participation in class discussions (40%), Quizzes (30%), Course paper/project (30%).

Class discussions will be integral to the course. While there will be lecture materials, students are expected to interact with the instructor and each other in moderated discussion of each day’s materials. Students are expected to contribute at least one question for class discussion each week.

Quizzes will be given for the different sections of the course to verify understanding of important concepts and definitions. Since the course is designed to provide a synthetic understanding of how fire behavior and ecosystems interact, it is critical that concepts of each section are understood.
Course paper/project: The paper or project is a flexible assignment that must be approved by the instructor. The purpose is to provide the student with vehicle for applying the course materials to their own research or to an ecosystem or region of interest. A literature review can be used for this but the student is expected to explore the concepts from the course and synthesize materials. The project may also be related to data analysis or similar work if pertinent to the course.

Supplemental Readings:


<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture Topic</th>
<th>Text Reading</th>
<th>Supplemental Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/19/11</td>
<td>Course Introduction, Film – Fire Wars</td>
<td>Whelan; Chapter 1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2/2/11</td>
<td>The Fire Environment; Topographic Influences; Basic Weather; Video</td>
<td>Schroeder and Buck; Chapter 1</td>
<td><a href="http://meted.ucar.edu/fire/fwx/">http://meted.ucar.edu/fire/fwx/</a> Flannigan et al. 2000; McKenzie et al. 2003; Running 2006; Westerling et al. 2006</td>
</tr>
<tr>
<td>4</td>
<td>2/9/11</td>
<td>Temperature/Humidity, Atmospheric Stability</td>
<td>Schroeder and Buck; Chapters 2, 3, &amp; 4</td>
<td><a href="http://meted.ucar.edu/fire/fwx/">http://meted.ucar.edu/fire/fwx/</a> Bessie and Johnson 1995</td>
</tr>
<tr>
<td>5</td>
<td>2/16/11</td>
<td>Winds</td>
<td>Schroeder and Buck; Chapters 5-10</td>
<td><a href="http://meted.ucar.edu/fire/fwx/">http://meted.ucar.edu/fire/fwx/</a> Agee 1997</td>
</tr>
<tr>
<td>6</td>
<td>2/23/11</td>
<td>Fuels; Fuel Moisture</td>
<td>Schroeder and Buck; Chapter 11</td>
<td>Brown 1974; Agee 1993 pages 42-52; Kulakowski and Veblen 2007</td>
</tr>
<tr>
<td>7</td>
<td>3/2/11</td>
<td>Fire Behavior/ First and Second Order Fire Effects</td>
<td>Cochrane and Ryan 2009</td>
<td>Bailey 1882; Cochrane et al. 1999; Ryan 2002</td>
</tr>
<tr>
<td>8</td>
<td>3/16/11</td>
<td>Plant Tolerance to Fires</td>
<td>Whelan; Chapter 3 (pages 58-103)</td>
<td>Ryan et al. 1993; Bond et al. 2005</td>
</tr>
<tr>
<td>9</td>
<td>3/23/11</td>
<td>Fire and Evolution in Plants</td>
<td>Whelan; Chapter 3 (pages 116-134)</td>
<td>Mutch 1970; Schwilk and Ackerly 2001; Bond and Scott 2010</td>
</tr>
<tr>
<td>10</td>
<td>3/30/11</td>
<td>Fire and Animals</td>
<td>Whelan; Chapter 3 (pages 104-116); Chapter 6</td>
<td>McCullough et al. 1998</td>
</tr>
<tr>
<td>11</td>
<td>4/6/11</td>
<td>Plant Populations and Fire</td>
<td>Whelan; Chapter 5</td>
<td>Turner et al. 1997; Wellington and Noble 1985; Donato et al. 2006 – and resulting controversy</td>
</tr>
<tr>
<td>12</td>
<td>4/13/11</td>
<td>Human Land Use and Fire Regime Changes</td>
<td></td>
<td>Bowman 1998; Cochrane 2003; Donovan and Brown 2007</td>
</tr>
<tr>
<td>13</td>
<td>4/20/11</td>
<td>Plant Communities and Fire</td>
<td>Whelan; Chapter 7</td>
<td>Jackson 1968; Brooks et al. 2004; Brown et al. 2008</td>
</tr>
</tbody>
</table>
Standard Disclaimers

ADA STATEMENT: South Dakota State University is committed to providing equal access to University programs and services for all students. Under University policy and federal and state laws, students with documented disabilities are entitled to reasonable accommodations to ensure the student has an equal opportunity to perform in class. If any member of the class has such a disability and needs special academic accommodations, please notify me and make the appropriate arrangements with the Office of Disabilities Services. The ODS is located in Room 145 of Binnewies Hall. To schedule an appointment call (605) 688-4504 and request to speak with Nancy Hartenhoff-Crooks, the Coordinator of Disability Services. Reasonable accommodations may be arranged after the Office of Disabilities Services has verified your situation. Do not hesitate to contact me if any assistance is needed in this process.

ACADEMIC FREEDOM AND RESPONSIBILITY STATEMENT: Freedom in learning. Students are responsible for learning the content of any course of study in which they are enrolled. Under Board of Regents and University policy, student academic performance shall be evaluated solely on an academic basis and students should be free to take reasoned exception to the data or views offered in any course of study. Students who believe that an academic evaluation is unrelated to academic standards but is related instead to judgment of their personal opinion or conduct should first contact the instructor of the course. If the student remains unsatisfied, the student may contact the department head and/or dean of the college which offers the class to initiate a review of the evaluation.

CHEATING AND DISHONESTY POLICY: The consequences of academic cheating and dishonesty range from any and all plagiarized or compromised assignments, tests, and other forms of evaluations being given zero credit as per offense to a student being given a failing grade for the class in which the offense took place. There is also the possibility that any student who has committed a cheating offense may face disciplinary probation or expulsion from the University. The full policies are found in Chapter 1 of the Student Code (01: 10:23:01-1: 10:23:04) of the SDSU Student Policies Manual.

Freedom in learning. Under Board of Regents and University policy student academic performance may be evaluated solely on an academic basis, not on opinions or conduct in matters unrelated to academic standards. Students should be free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Student who believe that an academic evaluation reflects prejudiced or capricious consideration of student opinions or conduct unrelated to academic standards should first contact the instructor of the course to initiate a review of the evaluation. If the student remains unsatisfied, the student may contact the department head and/ or dean of the college which offers the class to initiate a review of the evaluation.