#### AOS/IES 520

# Spring 2011 BIOCLIMATOLOGY

3 credits

TTh 9:30-10:45 am AOSS 811

Professor Ankur Desai 265-9201 1549 AOSS

Email: desai@aos.wisc.edu

Office Hours: Tue and Thu 11-12 or by appointment

Web page: https://learnuw.wisc.edu/ (login with your NetID to access course)

#### **Course Materials**

Required:

Bonan, Gordan. 2008. *Ecological Climatology: Concepts and Applications*, 2<sup>nd</sup> edition. Cambridge Press. ISBN: 978-0-521-69319-6.

#### Recommended:

Hartmann, Dennis. 1994. *Global Physical Climatology*. Academic Press. ISBN: 978-0-123-28530-0. Chapin III, F. Stuart. 2004. *Principles of Terrestrial Ecosystem Ecology*. Springer. ISBN: 978-0-387-95443-1

All books are available at University Bookstore and on reserve at the SSEC Library (3<sup>rd</sup> floor AOSS)

### **Course content**

*Bioclimatology* is the study of the connection between **living organisms** and **climate**. This 3-credit graduate course is designed for students interested in seeking answers to questions such as:

- What are the fundamental *ecosystem-relevant* aspects of the climate system?
- What are the basic *climate-relevant* functions of organisms and ecosystems?
- How do the two interact and how does changing land use and climate alter these interactions?

### **Grading**

Short problem sets and literature review response papers -30%Final group project (proposal 10% / report 10% / presentation 10%) -30%Two exams (20% each) -40%

#### Course Structure

Classes will consist of standard lectures, and interactive discussion is encouraged. On most Thursdays, in addition to lecture, we will either review current and classical literature in bioclimatology or the most recently assigned problem set. Students are encouraged to work on the problem sets together and suggest literature for review. When doing literature reviews, every student will submit a one page response paper.

The final project will be a small group (3-4 people) integrative analysis of ecoclimatological data. The nature of the project will be selected through an in-class proposal competition. Final results will be presented in a group conference extended abstract and oral presentation at the end of semester. More details will be provided early in the semester.

## **Course Calendar**

## Part I. Climate System

Week 1 1/18:1/20 Introduction to ecological climatology and system dy	

Week 2 1/25;1/27 Physics of the climate system

NO CLASS TUE 1/25

Week 3 2/1;2/3 Dynamics of the climate system

NO CLASS TUE 2/1

Week 4 2/8;2/10 General atmosphere and ocean circulation

Week 5 2/15;2/17 Feedbacks, stability, and trends

### Part II. Ecosystems and Climate

Week 6 2/22;2/24 Ecosystems and biomes

THU 2/24 Exam I

Week 7 3/1;3/3 Ecosystem energetics and energetics

THI 3/3 Research proposal due

Week 8 3/8;3/10 Ecosystem dynamics Break 3/15;3/17 SPRING BREAK

Week 9 3/22;3/24 Ecosystem-ocean-atmosphere interaction

## Part III. Biogeochemistry and Global Interactions

Week 10	3/29;3/31	Global biogeochemical cycling	
Week 11	4/5;4/7	Biogeochemistry and climate	
Week 12	4/12;4/14	Ecohydrology and climate	

THU 4/14 Exam II

Week 13 4/19;4/21 Anthropogenic effects and ecosystem resilience

### Part IV. Group Conference and Conclusion

Week 14 4/26;4/28 Final presentations

Week 15 5/3;5/5 Final presentations and Conclusion

THU 5/5 Research paper due

NO FINAL

### **Accommodation Policy**

Campus policy: "We believe in the right of all students who are enrolled at the University of Wisconsin-Madison to full and equal educational opportunity. Disability should not be the basis for exclusion from educational programs. All students are entitled to an accessible, accommodating, and supportive teaching and learning environment. ... Students are expected to inform faculty, in a timely manner, of their need for special instructional accommodations."

Students requiring class accommodations due to a learning or physical disability must present documentation from the McBurney Disability Resource Center (<a href="http://www.mcburney.wisc.edu/">http://www.mcburney.wisc.edu/</a>; 608-263-2741, Middleton Bldg, 1305 Linden Dr) in the first week of class. Accommodations will be made in consultation with the McBurney Center.

Students who require temporary accommodations due to medical or psychological reasons should acquire documentation from University Health Services. Counseling is available from Counseling Services, University Health Services (http://www.uhs.wisc.edu/; 608-265-5600, 333 East Campus Mall).