Geography 5921: Microclimatology: Boundary Layer Climatology – Spring 2017

Class times: M, W 2:20-3:40 pm
Classroom: Derby Hall, room 1080

Instructor: Jim DeGrand
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Office hours: 9-11 am, M & W, or by appointment

Course Description: This course presents the theory of exchanges of energy and mass at the Earth-atmosphere interface as it relates to microclimates with particular emphasis upon radiation and climate.

Course Objectives: The objectives for this course are for students to gain an understanding of:

- the flow of radiation through the earth's climate system and an appreciation of the fundamental role radiation plays in climate determination
- the surface energy balance of radiative, turbulent and conductive energy transfers
- the impact of different surface types and ground covers on the energy balance and how these impacts manifest themselves in local climate
- the manner in which human beings both deliberately and inadvertently modify the surface energy balance and local climate.

Course Structure: The above objectives will be obtained through:

- close reading of the textbook by the student
- lectures presented by in class
- class discussions
- homework assignments
- examinations

Readings/Quizzes: There will be weekly reading assignments and from the text and weekly online quizzes covering these readings. I will announce the reading assignment for the week in class (and on the Carmen site) on Mondays. The quizzes will be available until the following Sunday evening. In addition to taking the online quizzes, students will prepare at least one question regarding the reading assignment to bring to class on Monday.

Class Discussions/Participation: In general we will begin each Monday class with a discussion of the preceding reading assignment. I will collect the questions prepared by the students and use these as the focus of the discussion. Student attendance in class, thoughtful preparation of discussion questions and participation in the ensuing discussions will be incorporated in the participation portion of the class grade.

Homework Assignments: There will be 4 homework assignments given out during the semester. These will focus on major concepts in the course and will give the student an opportunity to apply concepts presented in class to numerical problems. With regard to mathematics: a knowledge of algebra, geometry and trigonometry will be sufficient to solve any problems presented in the assignments.

Examinations: There will be 2 examinations: one midterm and one final examination. While the final exam is not explicitly designed to be cumulative, many of the concepts presented in the course build upon one another so it is likely that the final will include material from the entire semester. The final exam will take place in Derby 1080 on **Tuesday, May 2 from 4:00 to 5:45 pm**.

Evaluation:

15% Class participation
15% Online quizzes
40% Homework assignments
30% Exams

Textbook: Required: Oke, T. R., Boundary Layer Climates, (1987).

Order of Topics Covered

Boundary layer concepts (Oke, chap 1)
Radiation budget, solar geometry (Oke, chap 1, Appendix A1)
Energy balance (Oke chap 1)
Physical basis for boundary layer climate (Oke chap 2)
Climates of simple non-vegetated surfaces (Oke, chap 3)
Climates of vegetated surfaces (Oke, chap 4)
Climates of non-uniform terrain (Oke, chap 5)
Climate modification (Oke, chap 7,8)

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp).

Disability Services

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.ohio-state.edu/.

Cell Phones
I expect students to be engaged in course activities during class time. To the extent that cell phones represent a distraction from what is happening in class, I request they be put away while class is in session.

Some Tips for Doing Well

- Attend classes
- Read the textbook
- Actively participate in the in-class presentations and discussions
- Check the course Carmen page frequently for updates