GEOG 401 Weather and Climate Fall 2007

SYLLABUS

Instructor: Martha Shulski (336 IARC, martha@climate.gi.alaska.edu, 474-7885)
Office hours: M (1:30 – 3:00), W (3:00 – 4:00), or by appointment

Credits: 3

Dates: MWF 10:30 – 11:30 (9/7 to 12/14, Finals week: 12/17)

Place: Duckering 347

Prerequisites: GEOG 205 (Elements of Physical Geography) or permission of instructor

Description: This course will serve as an introduction to basic weather and climate principles such as energy balance and energy exchange, atmospheric stability and cloud formation, atmospheric pressure and winds, severe weather events, climate classification and climate change.

Objectives: The main objective of this course is to provide students with an understanding of the primary concepts related to weather and climate. Students should come away from this class knowing the importance of this topic in the broader scope of geography.

Required Text: *Meteorology Today* (8th Edition) by C. Donald Ahrens

Supplements: IPCC Report, 4th Assessment, 2007 (http://www.ipcc.ch/)
Arctic Climate Impact Assessment, 2004 (http://www.acia.uaf.edu/)

Course Website: http://climate.gi.alaska.edu/courses/geog401/index.html

Grading:

Homework	15%
Exam I	20%
Exam II	20%
Final Exam	20%
Research Paper	25%

Grading Scale:

90 to 100%	A (outstanding)
80 to 89%	B (above average)
70 to 79%	C (average)
60 to 69%	D (below average, but passing)
< 60%	F (failure to pass the course)

Attendance: Though attendance will not formally be taken, your active participation in the course during lectures with questions and discussion is expected.

Academic Integrity: Plagarism and cheating are serious matters. The UAF Honor Code defines academic standards that are expected of each student.
(http://www.uaf.edu/uaf/current/policies.html)

Disabilities Services: The UAF Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. The course instructors will work with the Office of Disabilities Services to provide reasonable accommodation to students with disabilities. Please notify the instructor of any special needs.

Research Paper:
Your research paper will be on a topic of your choice in the overall theme of climate change and variability. Possible choices include, but are not limited to: *model predictions for the Arctic, consequences of change at high latitudes, paleoclimatology, regional climate variability, abrupt climate change and impacts, review of natural and anthropogenic climate change*. Be creative and choose a topic that directly relates to your specific weather/climate/geography interests.

This will be a manuscript-type professional review paper including the following elements: Abstract, Introduction, Discussion, Conclusions, References and should not exceed 20 pages. Figures and tables should be used in the paper but remember to use them wisely and not just as space fillers.

You must decide on your paper topic early in the class, your topic idea is due by October 5. Your final paper is due on or before December 7. Any late papers will cause a 10% reduction in your grade. Note that this paper one-quarter of your final grade so take it seriously and start early so you have time to make edits and revisions.

Do not rely the Internet as your primary resources. Although this is a good tool for searching, your references must be mostly from books, journals, and other scholarly publications. The Mather Library at the International Arctic Research Center has access to many weather and climate related journals and books and their staff is quite helpful *(http://www.gi.alaska.edu/services/library/)*.

Proper citing for materials is as follows:
Book –
Ahrens, C.D., 2007. *Meteorology Today: An Introduction to Weather, Climate, and the Environment*, 8th Ed., Thompson Brooks/Cole, California, 537 pp.

Journal Article –
Walsh, J.E. and W.L. Chapman, 1990. Short-Term Climatic Variability of the Arctic, *Journal of Climate*, 3(2), 237-250.

Course Schedule: **Though I will try to follow this schedule, this is tentative and is subject to change.** Number in parenthesis denotes chapter in Ahren's book

Week	Dates	Monday	Wednesday	Friday
1	9/7			Introduction to class
2	9/10 – 9/14	Earth's atmosphere (1)	Energy pt. 1 (2)	Energy pt. 2 (2)
3	9/17 – 9/21	Temperature variability pt. 1 (3)	Temperature variability pt. 2 (3)	Atmospheric moisture pt. 1 (4)
4	9/24 – 9/28	Atmospheric moisture pt. 2 (4)	Instrumentation demonstration	Condensation: dew and fog (5)
5	10/1 – 10/5*	Condensation: clouds (5)	Cloud observations, Stability (6)	Stability and cloud development (6)
6	10/8 – 10/12	Precipitation processes (7)	Precip types and measurements (7)	Wrap-up and review
7	10/15 – 10/19	**EXAM I**	Atmospheric pressure (8)	Laws of motion and forces (8)
8	10/22 – 10/26	Small-scale winds (9)	Local-scale winds (9)	Global wind systems and jet streams (10)
9	10/29 – 11/2	Atmosphere-ocean interaction, climate signals (10)	Air masses and fronts pt. 1 (11)	Air masses and fronts pt. 2, how to read a weather map (11)
10	11/5 – 11/9	Mil-latitude cyclones and polar lows (12)	Making a weather forecast (13)	Forecasting in Alaska-Field trip to Fairbanks NWS Office (IARC)
11	11/12 – 11/16	Thunderstorms and tornados (14)	Thunderstorms and wildfire in Alaska	Hurricanes (15)
12	11/19 – 11/23	Wrap-up and Review	**EXAM II**	*Thanksgiving holiday – no class!*
13	11/26 – 11/30	Intro to climate (17)	Global and regional climates (17)	Past climates and causes of change (16)
14	12/3 – 12/7	Climate data and observations	Climate models (16)	Climate projections **Research Paper Due!!**
15	12/10 – 12/14	Climate of Alaska	Special topics (air pollution, etc.)	Wrap-up and review
16	12/17 – 12/21 *Finals Week*		**Final Exam 10:15 – 12:15pm**	*Grades posted*

Key dates to remember:

10/5	Research paper topic due*
10/15	Exam I
11/21	Exam II
11/23	No Class
12/7	Research paper due
12/19	Final Exam