ATMO 170A1 Sections 001/004
Introduction to Weather and Climate
Professor Mullen
Fall 2013

Class Hours and Location: MWF 2:00 pm – 2:50 pm PAS 201.

Instructor: Prof. Steven L. Mullen (DrM for short). PAS 552.

Teaching_Assistants:	Gina Medici	Ethan Smith	Reid Strickler
	PAS 558	PAS 558	PAS 558

Class Email: **Use List Serve for class matters.**

Email is exclusively used for all student communications.
I do not answer office phone calls.
I do not have an active university voicemail system.
I do not listen to student voicemails; they are immediately erased.
I do not return student phone calls.
An email only policy protects students and instructors alike. It ensures that there is a written record to confirm all communications.

Student use of the mullen@atmo.arizona.edu address and TA's personal email addresses is reserved **exclusively** 1) to schedule an appointment if it is not possible to come during office hours or 2) to discuss private matters about extenuating circumstances (defined see below) that could affect your performance in the class. You are to use List Serve for questions related to the material in class.

Office Hours:

Dr. Mullen:	MW 3:00 pm - 3:50 pm (after class)
email	F 11:00 am -11:50 am
	MW 10:30 am -12:00 pm (by appointment)
Gina Medici:	M 12:30 pm – 1:45 pm
email	W 9:00 am – 10:30 am
Ethan Smith:	T 1:00 pm - 2:30 pm
email	R 9:00 am – 10:30 am
Reid Strickler:	T 9:00 am – 10:30 am
email	R 1:00 pm -2:30 pm

Office hours of teaching team are subject to change with advance notice

Required Textbook:
C. Donald Ahrens (author)
Essentials of Meteorology: An Invitation to the Atmosphere, 6th Ed.
ISBN-13: 9780840049339. *(Available in Bookstore. May cost less online.)*

Recommended (Highly) Study Guide:
C. Donald Ahrens (author)
Study Guide for Ahrens' Essentials of Meteorology: An Invitation to the Atmosphere, 6th Ed. ISBN-13: 9780840054067. (Not available in bookstore.)

The 5th edition might work for students who already own it but do not wish to buy another textbook, or for those looking to save money by buying an used earlier edition. Even editions earlier than the 5th might work. I have had students who even used the 4th edition-but the earlier the edition, the less effective. If you decide to use any edition earlier than the required 6th, you are on your own matching equivalent subject matter in an older edition.

Bottom line: wherever you get the book and whatever edition you use is a personal decision. Just get the bloody textbook. Now. There is a lot of meaty, required reading for this course, and it starts day one. The length of assigned reading averages 10-15 pages per lecture, but the number of pages per lecture is highly variable. Some lectures require just 5 pages or so, while others require up to 25! Plan ahead accordingly.

Do not fall behind the assigned reading.
If you do, you are likely doomed!

Course Description:
An introduction to the science of weather and climate. Topics are selected from atmospheric composition, energy balance, wind systems, genesis of fronts and cyclones, precipitation processes, clouds, severe weather, weather prediction, climate and optical phenomena. Emphasis is placed on the fundamental importance of physics, chemistry and mathematics to the atmospheric sciences. The first part of the course mostly deals with concepts (e.g. energy, heat, force) that are needed to understand the structure and behavior of the atmosphere. The second half deals with specific meteorological phenomena. Emphasis is given to phenomena that have strong impacts on human activities and economic livelihood such as winter storms, heat waves, drought, tornadoes, hurricanes, air-sea interactions (El Niño), climate change (natural and anthropogenic), ozone depletion, and air pollution.

Grading Policy:
Course grade will be computed as follows.

1) Examinations: 50% (5 best quizzes x 10% each).
2) Homework and D2L exercises: 20%.
3) Term Project: 30%.

4) Extra credit: Students can earn up to **5% extra credit** for responding to and correctly answering a baseline percentage of the in-class "clicker" questions. The amount of extra credit (or penalty) earned is no lower than

P% Right	P<40	40≤P<50	50≤P<65	65≤P<80	80≤P<90	90≤P
Bonus	-5% to 0%	1%	2%	3%	4%	5%

"No response" questions are treated as incorrect (but used for attendance purposes), so the final percentage is computed with respect to every question given during the semester. Students are issued one point for each clicker question attempted and given another point for a correct answer. For example, assume there are 100 questions during the semester. So there would be a maximum of 200 possible points. Assume you attempt 90 questions and answer 82 correctly. Your final point total would be 90+82= 172. Your percentage *P* = 172/200 = 82% since the 10 missing questions are treated as incorrect.

4) Classroom participation: I reserve the right to impose up to a **5% penalty** for excessive absences as recorded by the clicker response system. Note that attendance will be taken on exam days too. An absence can be recorded for any date on which you are not present for both the first set of clicker questions and the last set of clicker questions for that day's session.

You are allowed a maximum of 5 forgiven absences (about 11% of 45 total class days). Each unexcused absence above 5 counts for up to a 1% deduction per absence until the 5% ceiling is reached. For example

Absences	A ≤ 5	A=6	A=7	A=8	A=9	A ≥ 10
Penalty	0%	1%	2%	3%	4%	5%

Plus or minus 5% often means the difference between earning an A or B, B or C, etc. So attending class, responding to the clicker questions, and doing the reading prior to the lecture so you can answer the clicker questions correctly constitute an important component of the course.

The five best scores among the five quizzes and the final exam, which counts the same as two quizzes, are used to calculate your average exam grade with the course grade assigned in accordance to the above grading policy. Hence, you can consider the final optional if you are satisfied with your course grade using the scores of your five midterms. Note however that *taking the final could only help your grade; it never hurts your grade.* For example, if your score on the final is higher than the scores of two or more midterms, then final replaces the two quizzes with the lowest scores. If your score on the final is higher than the score on only one quiz, then the score of that quiz is replaced by score of the final and the final essentially counts as one quiz. If your score on the final is lower than the score on every midterm, the score of your final is disregarded.

Consider four examples that cover every possible outcome of the score of the final relative to the scores of the quizzes.

Assume your scores on the five midterms are as shown in the table.

Quiz 1	Quiz 2	Quiz 3	Quiz 4	Quiz 5	Average
70%	60%	50%	88%	82%	70%

1) 80% on the final.
80% exceeds the score of three quizzes (#1 #2 #3). The score of final replaces the two lowest scores (#2, #3). Final raises Average 10%.

Quiz 1	Final	Final	Quiz 4	Quiz 5	Average
70%	~~60%~~	~~50%~~	88%	82%	~~70%~~
70%	80%	80%	88%	82%	80%

2) 65% on the final.
65% exceeds the score of two quizzes (#2 #3). The score of the final replaces the scores of those two quizzes (#2 #3). Final raises grade 4%.

Quiz 1	Final	Final	Quiz 4	Quiz 5	Average
70%	~~60%~~	~~50%~~	88%	82%	~~70%~~
70%	65%	65%	88%	82%	74%

3) 55% on the final.
55% exceeds the score of only one quiz (#3). The score of the final replaces only the score of quiz 3. Final raises grade 1%.

Quiz 1	Quiz 2	Final	Quiz 4	Quiz 5	Average
70%	60%	~~50%~~	88%	82%	~~70%~~
65%	60%	55%	88%	82%	71%

4) 45% on the final.
45% is lower than the score of every quiz. The score of the final is discarded. Final does not change grade.

Quiz 1	Quiz 2	Quiz 3	Quiz 4	Quiz 5	Average
70%	60%	50%	88%	82%	70%
70%	60%	50%	88%	82%	70%

Each midterm quiz will consist of approximately 25 total questions in the form of multiple choice, matching, recall or short answer questions. A few extra credit questions/points usually appear on a quiz. Each quiz will cover new material presented up through the end of the previous lecture period. When the date of a quiz becomes final, the date will be announced several days before the quiz is given. Unless stated otherwise, the time for exams is **the start of class (2:00 pm). Students who arrive "late" to class on test dates will not be allowed to take the quiz, where "late" is defined as arriving after the first student turns in their exam. Bring your *CAT CARD* on test days; the teaching team reserves the right to verify your identification.**

Final Exam
Tuesday, Dec 17
3:30 pm – 5:30 pm
PAS 201

Per University policy, there are NO exceptions on the date/time/location of the final exam. You must take the final at its designated time. Bring your *CAT CARD* to the final (and every quiz). The final will consist of approximately 50 multiple-choice questions, matching, recall and/or short answer questions. Approximately half of the questions will be taken ***verbatim*** from the five prior midterm exams.

A student may be granted permission in rare circumstances to take an exam at an alternate time and/or hand-in assignments on a different due date if he/she is covered by one of the following conditions: 1) Travel owing to participation in NCAA sporting events on test days or assignment due dates. 2) Extenuating personal circumstances (e.g. *very serious* or *life-threatening* illness). Please note that the following DO NOT qualify as extenuating circumstances: *"Parents already bought my plane ticket to go home" (my personal favorite since it is used at least once every term); flu; common cold; uncommon cold; allergies; sniffles; alarm did not "go off"; alarm did go off but too late; alarm went off but not heard; dead battery; flat tire; mechanical car problems; operator car problems; stolen bicycle; broken bicycle; broken computer; stolen computer; frozen computer; pet died; missing pet; missing keys; missing the bus; missing the boat; morning blues; sleepless night; got dumped … The list is endless.* **Appropriate and verifiable documentation is required by any student requesting to take an exam at an alternate time or hand in an assignment after the due date. Stated simply, your excuse better be good…real good…because I have heard most of the not so good ones**.

COURSE GRADING SCALE

A = points ≥ 90%
B = 80% ≤ points < 90% (10% range)
C = 60% ≤ points < 80% (20% range)
D = 50% ≤ points < 60% (10% range)
E = points < 50%

The grading scale is designed to give every student the opportunity to earn a passing mark (D or higher) if they put forth a concerned effort. The absolute scale is also designed to allow every student the opportunity to earn a superior mark (A or B) if they perform at a superior level. Please note that it is not possible for every student to pass, much less earn an A, when using a traditional "curve" to compute grades.

Note that there are NO extra credit projects. Exams are NEVER curved. Course grades are NEVER curved, and they are NEVER rounded up. Treat every possible point is precious, because it is. Plan ahead, do the reading and study…it's worth the effort.

Expectations:
The reading assignments for each day's lecture are listed on the course website prior to the lecture. You are expected to complete the suggested reading before the lecture. Unless you hear otherwise, you are always responsible for the reading material. You are invited to ask questions about the material during lecture, office hours or review sessions. Per University policy, I expect every student to devote *a minimum of two hours* outside of class to studying, reading, etc. for every contact hour in classroom.

See Definition of One Unit of Credit or ABOR Definition of One Unit of Credit.

Attendance Policy:
I consider attendance mandatory in the sense that it constitutes a significant portion of your course grade. It is taken daily, and excessive absences can adversely affect your course grade. As noted, class participation and attendance will be tallied through the use of electronic devices. After three unexcused absences, I reserve the right to issue an administrative drop (prior to the end of week 8) in accord with University policy. See Class Attendance. All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion if the instructor is given reasonable advance notice. Absences for participation in university-sponsored activities such as NCAA sporting events will be honored if the instructor is given reasonable advance notice. Students are responsible for all material missed in class. See Grading Policy regarding missed examinations or late assignments.

Academic Integrity:
I value academic integrity. The UA Code of Academic Integrity, Code of Conduct and Student Code of Conduct are strictly followed in the course. All students are responsible for knowing the codes and abiding by them. See Code of Academic Integrity. **Cheating is not tolerated. If I suspect an act of cheating I am professionally obligated to submit to the Dean of Arts, Letters and Science Office an allegation of violation of the Code of Academic Integrity.** If you are an honest student who plays by the rules and cannot stand those who cut corners, you can submit complaints about classmates, *anonymously*, online on D2L. I will investigate the allegations further.

Classroom Behavior:
Every student is expected to behave as a courteous adult and in manner that is consistent with enhancing the educational experience of your peer students. You are expected to not talk with your neighbors during class, to turn off any noise-producing electronic devices (e.g. cell phones, pagers, blackberries, iPods, iPads, mp3 players, etc.), to come to class in a proper mental state, and to

remain quiet and seated until I dismiss the class. **Disruptive or destructive behavior in the classroom, or any perceived threatening behavior toward fellow students or the teaching staff will be dealt with swiftly and accordingly** (See UA Policy Threatening Behavior).

Students with Disabilities:
If you anticipate barriers related to the format or requirements of this course, please meet with me so that we can discuss ways to ensure your full participation in the course. If you determine that special accommodations are necessary, please register with Disability Resources (621-3268; drc.arizona.edu) and notify me of your eligibility for reasonable accommodations. We can then plan how best to coordinate your needs with the class requirements.

Literacy Requirements:
There is a science literacy requirement. This means scientific notation is used for writing numbers (especially rather large or small ones). We specify units for all physical quantities (e.g. meters for length, kilograms for mass, seconds for time). We attempt to quantify physical relationships based on observations, everyday experiences, simple reasoning and the governing laws of physics.

There is another literacy requirement to do a mandatory project outside of class. The project is an analysis of daily weather observations for Tucson over a three-week period and involves a formal write-up of why the weather did what it did. Please note that following:

Students who do not submit a project will receive an "E" for the course, regardless of their performance on the exams and other assignments.

No Project = Course Failure

The project will be discussed in detail later in the course.

The Golden Rule of the course is simple…
Mutual Respect