

MET 101 – Introduction to Meteorology

Syllabus SPRING 2015

Instructor: Dr. Jennifer Griswold

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Office Hours: After Class (Tues-Thur 1:30-2:30pm) or By Appointment (HIG 341)

Class Times: Tues-Thur 12:00 PM -1:15 PM

Class Location: MSB 100

Course Web address: <http://jenniferdsmallphd.com/MET101.htm>

Teaching Assistants:

Andrew Frambach, andrew41@hawaii.edu, TBA

Christopher Goodman

Required Materials

1) *Essentials of Meteorology: An Invitation to the Atmosphere*, 6th or 7th edition by Ahrens, C. Donald.
Available from the bookstore, though older editions are fine (and likely cheaper).

Course Description

Welcome to Introduction to Meteorology! This is a lecture course, in which you can earn 3 units of credit. This course provides an introduction to atmospheric phenomena and weather. It is designed to provide comprehensive knowledge of the earth's atmosphere and its changing behavior as it relates to human activities and how it influences our daily lives. This course provides a first look at various aspects of meteorology including solar radiation, global circulation, environmental issues, winds, cloud formation, stability, precipitation processes, weather systems, and severe weather. The course will also cover meteorological terminology, large-scale climate processes such as El Niño, and will discuss techniques of weather forecasting. Basic physical principles and processes are emphasized that are important for understanding the world and have broad implications for students interested in weather and global environmental change and other environmental disciplines. We'll also learn about Hawaii weather as it applies to different topics throughout the course.

Lab Class (MET 101L): This course is taught by our class teaching assistants. They will cover some topics that I cover in a more applied, "Hands-On" way. Most students find the lab to be helpful but the lab is not required. Only material from the lecture and the book will appear on quizzes, HW and the Final Exam.

Basic Course and Classroom Conduct

1. Cell phones/iPods/etc. will remain off while in class or you will be asked to leave class.
2. Dropping the class is your responsibility. If you forget to drop the class formally, you will receive an F grade.
3. Cheating will result in a failing class grade.

Attendance Policy – 15 points (3% of your grade)

Attendance is mandatory and will be taken each class and counts towards your grade. Students not in attendance on the first day will be dropped as a "no-show" if there are waitlisted students. You may make up a quiz or exam **ONLY** if you inform me of the absence ahead of time via email. If your **excused** absence prevents you from turning in an assignment on its due date then you must turn in the work at the beginning of the next class you attend.

Reading, Exams and other Assignments

In order to succeed in this class, reading should be considered an ongoing homework assignment. Completing reading assignments will prepare you for lectures, quizzes, and exams. It is assumed that you possess the textbook, *Essentials of Meteorology: An Invitation to the Atmosphere (6th edition)*. The reading of these pages should be completed **BEFORE** the class session that will be covering that topic.

Lecture and reading will generally follow the *tentative* course outline below. Pages are for 6th edition.

Week	Date	Topic	Reading (completed before class)	Assignments Quizzes or Exams
1	1/13	Course Syllabus, Weather and Climate Intro	Ch 1 (Pgs 4 – 9)	
	1/15	Atmospheric Composition, Vertical Structure	Ch 1 (Pgs 10 – 24)	
2	1/20	Temperature and Heat Transfer, Absorption, Emission	Ch 2 (Pgs 28 – 44)	Quiz on
	1/22	Earth’s Annual Energy Balance, Seasons	Ch 2 (Pgs 44 – 54)	Ch. 1 HW 1 Due
3	1/27	Air Temperature (vertical and global)	Ch 3 (Pgs 58 – 71)	Quiz on
	1/29	Air Temp. Con’t Applications of Temperature Data	Ch 3 (Pgs 71 – 79)	Ch. 2 Start Blog
4	2/3	Water in the Atmosphere, Dew and Frost	Ch 4 (Pgs 84 – 97)	Quiz on
	2/5	Fog, Cloud Types, and Identification	Ch 4 (Pgs 97 – 113)	Ch. 3 Blog Post 1
5	2/10	Atmospheric Stability, Cloud Development	Ch 5 (Pgs 118 – 127)	Quiz on
	2/12	Precipitation Processes Precipitation Types	Ch 5 (Pgs 128 – 146)	Ch. 4 HW 2 Due
6	2/17	Inconvenient Truth (part 1)	No Reading	Quiz on
	2/19	Inconvenient Truth (part 2)	No Reading	Ch. 5 Blog Post 2
7	2/24	Atmospheric Pressure, Why Wind Blows	Ch 6 (Pgs 150 – 165)	
	2/26	Surface and Vertical Winds	Ch 6 (Pgs 165 – 174)	
8	3/3	Scales of Atmospheric Motion, Local Wind Systems	Ch 7 (Pgs 178 – 193)	Quiz on Blog Post 3
	3/5	Cell Models, Global Wind Patterns and the Ocean	Ch 7 (Pgs 193 – 210)	Ch. 6
9	3/10	Review for Midterm	REVIEW	REVIEW SHEET
	3/12	Cumulative MIDTERM EXAM	Ch 1-7	REVIEW SHEET
10	3/17	Air Masses and Fronts	Ch 8 (Pgs 214 – 233)	Quiz on
	3/19	Mid-Latitude Cyclones	Ch 8 (Pgs 233 – 242)	Ch. 7 Blog Post 4
11	3/24	SPRING BREAK	No Class	
	3/26			
12	3/31	Thunderstorms, Supercells, Thunder and Lightning	Ch 10 (Pgs 274 – 295)	Quiz on
	4/2	Tornadoes –Formation and Observation	Ch 10 (Pgs 295 – 309)	Ch. 8 Blog Post 5
13	4/7	Hurricanes Formation and Weakening	Ch 11 (Pgs 314 – 325)	Quiz on
	4/9	Hurricane Damage, Naming and Notable Hurricanes	Ch 11 (Pgs 325 – 340)	Ch. 10 HW 3 Due
14	4/14	Sky Color, Mirages	Ch 15 (Pgs 434 – 443)	Quiz on
	4/16	Halos, Sundogs, Sun Pillars and Rainbows	Ch 15 (Pgs 443 – 452)	Ch. 11 Blog Post 6
15	4/21	Types and Sources of Air Pollutants	Ch 14 (Pgs 406 – 419)	Quiz on
	4/23	Air Pollution and the Urban Environment	Ch 14 (Pgs 419 – 429)	Ch. 15
16	4/28	Past Climate and Natural Climate Change	Ch 13 (Pgs 374 – 388)	Quiz on
	4/30	Anthropogenic Climate Change, Climate Predictions	Ch 13 (Pgs 388 –401)	Ch. 14 Blog Post 7
	5/5	REVIEW FOR FINAL EXAM		Quiz on HW 4, EC Ch. 13 Due
Tues	5/12	CUMULATIVE FINAL EXAM : Noon - 2 pm (same room as class)		FINAL EXAM

Notes and Professor Podcasts

Through Power Point and the chalkboard I will provide you with an outline of key ideas for each class. I will verbally expand on these ideas during the lecture. The textbook supports the lectures, **not** vice versa. I teach you what I believe is important, not what any given textbook believes is important, and therefore not all the material in the text is required material, and some required material will not be available in the text (but most likely will be supported by supplemental reading, class lectures and discussions). Podcasts (audio recordings) for each lecture will also be posted online. They will not simply be “recordings” of class. They will be audio versions of the lecture to help you study and review the course material in an alternate format. Extra Credit information will be divulged in the Podcasts that will appear on the Midterm and Final Exams. You’ll need to listen to the podcast find out about them.

Blog Project – Semester Long Investigation into Weather and Climate in a Country other than the US

This course has a semester long Blogging Project. You will be required to start your own Blog and complete 7 blog posts worth 10 points each, for a total of 70 points. They are worth **14%** of your grade. They will be public and will be linked to the main class website. Each Blog assignment will be accompanied by a worksheet that will help guide you

through the content needed to complete the assignment. Grading standards/expectations of each Blog will be included with each assignment.

Quizzes – 13 quizzes worth 5 point each

Thirteen short weekly “surprise” quizzes will be given on each chapter, you will not know if the weekly quiz will be on Tuesday or Thursday. The quiz will be on material from the previous week. For example, chapter 2 is covered in week two, you will be quizzed on this material during week three. Thus, you must attend each class in case there is a quiz on a particular day. In total the quizzes are worth **13%** of your grade. You will find a list of vocabulary (Key Terms) at the end of each chapter. Quizzes may include T/F, Fill-In, multiple choice questions or sketching a diagram.

Exams – Midterm and Final

One midterm exam will be given, worth **20%** of your grade and one Final worth **30%**. Exams will be based on lecture and assigned reading. They will include matching, fill in the blank, multiple choice and essay style questions. You may not make up any exams (unless cleared with me beforehand). If you arrive late, you will not be given extra time to complete the exam. Exams will typically be announced as a reminder one week beforehand, they are already listed in the class schedule. If you would like additional help focusing on what you need to know for the exam, please see me during office hours or email me with specific questions. The practice of using cell phones to provide answers on exams has become prevalent. Therefore there will be no cell phones allowed in the class during an exam.

Extra Credit -- ** There will be no extra credit offered to any individuals. No exceptions. **

I may give out extra credit work, but if I do, it will be available for *all* students in the class.

Grading

Grading will not necessarily be “on a curve.” There is no expectation of what the average grade should be, nor what the grade distribution should look like. If everyone were to demonstrate outstanding understanding of all the material, then everyone deserves a grade of A (and I would be very happy to give each one of them)! I therefore encourage you to discuss the course material with each other to get the most out of the class.

Note: the points and percentages given are approximations and may vary slightly

	Total Points	Percentage
Attendance	15	3%
Quizzes (13, 5 pts each)	65	13%
Midterm Exam (1, cumulative)	100	20%
Blog Project (7 entries, 10 pts each)	70	14%
Homework (4, 25 pts each)	100	20%
Final Exam (cumulative)	150	30%
Total	500	100%

Grade Structure

Letter	Percentage
A+	> 100.00
A	93.50-100.00
A-	90.00-93.49
B+	86.50-89.99
B	83.50-86.49
B-	80.00-83.49
C+	76.50-79.99
C	73.50-76.49
C-	70.00-73.49
D+	66.50-69.99
D	63.50-66.49
D-	60.00-63.49
F	59.99 and below

Adjustment of letter grade: One can receive an **upward** adjustment of letter grade for a number of reasons (e.g. very strong improvement during the semester, notable participation during class, exceptional effort). Under no circumstances will a reduction in letter grade be given, and these adjustments are made after the normal grades are assigned and therefore affect no one else’s letter grade.

Dropping the Course

You are responsible for managing your courses. If you need to drop without a “W” grade the deadline is Tuesday January 20th. You can still withdraw from the course from January 21st- March 13rd for in-person restricted withdrawal. You will need a signature from me on the “Drop Form” if you drop the class after January 20th. April 1st is the last day I can give an “I” or incomplete for the course.

Student Learning Objectives (SLOs): Upon completion of the course, the student should be able to:

1. Demonstrate a familiarity with the basic vocabulary of meteorology.
2. Understand the mechanics of the earth's atmosphere.
3. Describe and explain the origin, composition, structure, short-term and long-term behaviors of the earth's atmosphere.
4. Understand and analyze important environmental problems related to the earth's atmosphere.
5. Have a basic understanding of the atmosphere and its processes to enhance appreciation of our planet.
6. Critically examine the phenomena of the Solar and Terrestrial Radiation and understanding the energy transfer by radiation, conduction, convection, and evapotranspiration and explain the factors that determine the distribution of solar energy over the Earth's surface and describe global patterns of temperature.
7. Understand and critically examine the atmospheric phenomena of temperature, moisture conditions, atmospheric stability, forms of condensation and precipitation, air pressure and winds, circulation of the atmosphere, role of air masses, and weather patterns.
8. Describe the major cloud types and explain the phenomena of rainfall, fog, snow, sleet, and frost.
9. Define a cold and warm front and explain the processes leading to the formation of each and also explain the formation of cyclones and anticyclones, tornadoes, hurricanes and typhoons.
10. Understand and describe the formation of thunderstorms, lightning and thunder.
11. Describe and analyze the changing climate in the past, present and future
12. Understand the impact that people have on the atmospheric environment.
13. Differentiate between global warming and the green house effect
14. Describe the phenomenon of El Nino-Southern Oscillation and the impacts it has on global precipitation and cloud patterns.
15. Describe various types of atmospheric optical phenomena including rainbows, mirages, halos, crepuscular rays, sun dogs, sun pillars, corona and glories.