

## SO244: Basic Atmospheric Processes

*Autumn 2011*

**Instructor:** Dr. Gina R. Henderson

**Office:** CH 206

**Office Hours:** by appointment

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**Class meeting time and Place:** MW 1430-1520, R 1330-1520, in room MI090

**Online Course Information:** via Blackboard

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**Required Textbook:** Meteorology Today, An Introduction to Weather, Climate, and the Environment, 9th edition. Author: C. Donald Ahrens.

**Readings:**

- Reading assignments are listed in the course syllabus. Students are encouraged to complete the readings prior to class to maximize the understanding of the lecture material.
- In addition to text reading assignments, guided lecture notes & labs will be posted on Blackboard. The student is expected to bring these notes to class or follow online in class. Posted notes have gaps & require augmentation provided during the lecture, from the textbook or from a classmate.

**Materials:** 3-ring binder, straight edge, #2 pencil, large eraser

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**I. Course Overview & Objectives:**

There are few aspects of the physical environment that influence our daily lives more than the atmosphere. Basic Atmospheric Processes (SO244) focuses on the analysis of the atmosphere, weather elements, air masses, fronts and storms from basic physical relationships. Principles of weather forecasting, especially as it relates to atmospheric circulation, moisture and severe weather are discussed.

**Learning Objectives:**

As a result of taking this course you should obtain certain content knowledge in meteorology (knowledge objectives) and be able to do demonstrate your content knowledge in meteorology (skill objectives):

**Knowledge objectives (things you should know by the end of the course):**

- Define the basic principles of energy in the earth and atmosphere systems.
- Describe fundamentally how temperature drives daily weather phenomena.

- Explain processes involving atmospheric moisture that lead to precipitation.
- Discuss using basic principles of the atmosphere the occurrence of severe weather events.
- Explain the role of weather in daily life and in Navy/Marine Corp operations.

***Skill objectives (things you should be able to do by the end of the course):***

- Utilize/interpret Skew-T/Log-P diagrams and weather charts.
- Calculate some basic radiation laws.
- Convert meteorological data into SI units and map fields.
- Conduct a simple weather discussion of current conditions across the country.

## II. Policy Statement

### a. Grade weights

Activity	Quantity	% of Final Grade	Comment
Quizzes	5	50%	Each worth 10% of final grade
Labs	8	15%	Grading weights will vary
Presentation/participation		5%	
Lab Exam (cumulative)	1	10%	10% of final grade
Final Exam (cumulative)	1	20%	15% of final grade

Grades will be assigned as follows (Instructor reserves the right to adjust the grading system):

A: 100%-90%    B: 89%-80%    C: 79%-70%    D: 69%-60%    F: 59% and below

### b. Deliverables

- i. Final Exam (20% of final grade): comprehensive final exam will be given at the end of the course. If a student is unable to attend an exam, they must make prior arrangements with the instructor.
- ii. Labs (15% of final grade): generally completed during assigned lab time. To maximize learning, work on labs individually or in pairs. Individual Labs will be graded and weighted according to length and difficulty.
- iii. Lab Practical Exam (10% of final grade): **cumulative lab exam** will be administered at the end of the course, covering knowledge and application of the basic concepts and skills learned in the labs.
- iv. Quizzes (50% of final grade): given per the syllabus & **based on lecture and lab material**. A quiz missed due to an excused absence will receive a grade of zero if not made up within 2 class meeting days. It is the student's responsibility to schedule a make-up. **A quiz missed due to an unexcused absence will receive a grade of zero.**
- v. Presentation / Participation (5% of final grade): Discussions of the synoptic weather over the Eastern United States will be conducted daily – **initially by the instructor then by the students**. Format will be provided by the instructor during the course. Students will

be graded on presentation skills & brief content. Part of this grade will also include a student's engagement/participation in the class in general.

**c. Section Leader:**

- A Section Leader and Assistant Section Leader will be assigned and are expected to become thoroughly familiar with COMDTMIDNINST 1080.1.
- Section Leaders are responsible for calling the section to attention at the beginning & end of class.
- If a student is not present when class is called to attention, an absence will be reported by the Section Leader.
- If the instructor is not present at the start of class or during class for any reason, the Section Leader is responsible for maintaining class order until given further instruction or being relieved by a faculty member.

**d. Attendance:**

- Attendance is governed by the table of priorities in COMDTMIDNINST 5400. If you will miss a class or a lab due to an authorized absence you must notify the instructor at least one day in advance and make other arrangements.
- You are responsible for obtaining any materials provided or covered during a missed class or laboratory period.
- Class presentations, labs, assignments, and handouts can be obtained from another student, downloaded from the course page on Blackboard, or can be obtained by making special arrangements with the instructor.
- The Instructor reserves the right to give a grade of zero to any assignment, quiz, Laboratory Exercise/Report, or Exam that is missed due to an unexcused absence.

**e. Extra Instruction:**

- Extra instruction (EI) is available by appointment in advance. Email is the preferred method for scheduling and arranging EI. Please do not hesitate to ask for assistance and do not wait until the last minute.

**f. Classroom Policy:**

- Proper military etiquette & courtesy is expected at all times. Use the same standards of appearance & conduct expected by your company officer.
- Unless required for official watch duties, all cell phones, personal computers, PDAs, or any other electronic devices should be turned off while in class or lab.
- Walking out of class in the middle of a lecture or laboratory is disruptive to your instructor and classmates. Midshipmen will refrain from leaving during the middle of class unless absolutely necessary. In such cases, get the instructor's attention, ask

permission to leave and, when given permission, quietly excuse yourself. Return promptly and quietly to the classroom, minimizing disruption of the class or lab in session. Leaving class during a Quiz or Exam will only be allowed in special situations.

- You may bring a personal calculator to class or lab but you may not use it on Exams or Quizzes. ***Personal calculators may only be used for simple mathematical calculations and will not be pre-programmed or loaded with any additional applications, equations, functions, information, or data related to the course.*** When required for an Exam or Quiz, a calculator will be provided by the Oceanography Department.
- Classroom discussion and participation is highly encouraged. Please get the instructor's attention and be recognized before asking a question or presenting a topic for discussion.
- Bring a pencil with eraser, pen, and assigned readings/materials to each lab and class.
- Equation sheets: an equation sheet will be provided by the instructor for quizzes & exams. No notes may be made on the sheet unless specifically indicated. With the exception of a writing utensil & a calculator, the equation sheet is the only outside resource permitted during quizzes & exams.
- No food or drink is allowed in the classroom or laboratory except drinks in a closeable, leak-proof container.

**g. Honor:**

As future leaders of the Navy & Marine Corps and our nation, ***the Honor Concept is always in effect.***

*"Midshipmen are persons of integrity: We stand for that which is right. We tell the truth and ensure that the full truth is known. We do not lie. We embrace fairness in all actions. We ensure that work submitted as our own is our own, and that assistance received from any source is authorized and properly documented. We do not cheat. We respect the property of others and ensure that others are able to benefit from the use of their own property. We do not steal."*

Plagiarism is stealing, using, and/or presenting someone else's ideas, words, products, or other intellectual property as your own without permission and without giving proper acknowledgement or credit. Plagiarism is an act of theft and fraud. Be sure you fully and openly credit any sources used. If at any time you have a question or a doubt as to whether your actions or behavior are in accordance with the Honor Concept, it is your duty to immediately bring the issue to the attention of the Instructor for clarification and guidance. This Course Policy Statement is meant to offer additional guidelines specific to this course and in no way supersedes official guidance promulgated in *USNAINST 1610.3H (HONOR CONCEPT OF THE BRIGADE OF MIDSHIPMEN)* or *USNAINST 1531.53B (Policies Concerning Graded Academic Work)*.

### III. SO244 Autumn 2011: Tentative Schedule\*

\*Course syllabus is TENTATIVE and may be changed at the discretion of the instructor.

Week	Day	Date	Lesson #: Title	Reading	Notes
1	M	22 AUG	Introduction; Lesson 1: Earth's Atmosphere	Ch 1	Geography Quiz
	W	24 AUG	Lesson 1 (continued)	Ch 1	
	R	25 AUG	Lesson 2: Energy	Ch 2	
2	M	29 AUG	Lesson 2: Energy (Continued)	Ch 2	
	W	31 AUG	Lesson 2: Energy (Continued)	Ch 2	
	R	1 SEP	Lab 1: Radiation Laws and Surface Energy Balance	Lab 1	
3	*T	06 SEP	Quiz 1 Review	Review	*Monday Schedule
	W	07 SEP	Quiz 1 (Geography, Lessons 1, 2)	Ch 1-2	QUIZ 1
	R	08 SEP	Lab 2: Introduction to MET Data and Products	LAB 2	Lab 1 Due
4	M	12 SEP	Lesson 3: Seasonal Temperatures	Ch 3	
	W	14 SEP	Lesson 3: Seasonal Temperatures (continued)	Ch 3	
	R	15 SEP	Lab 3: Weather Chart Hand Analysis	LAB 3	Lab 2 Due
5	M	19 SEP	Lesson 4: Atmospheric Moisture	Ch 4	
	W	21 SEP	Lesson 4: Atmospheric Moisture (continued)	Ch 4	
	R	22 SEP	Lab 4: Sling Psychrometer & Relative Humidity	LAB 4	Lab 3 Due
6	M	26 SEP	Quiz 2 Review	Review	
	W	28 SEP	Quiz 2 (Lessons 3, 4)	Ch 3-4	QUIZ 2
	R	29 SEP	Lesson 6: Stability and Cloud Development	Ch 6	Lab 4 Due
7	M	03 OCT	Lesson 5: Condensation: Dew, Fog, and Clouds	Ch 5	
	W	05 OCT	Quiz 3 Review	Review	
	R	06 OCT	Lab 5: Skew T Log P Diagram Applications	LAB 5	
8	M	10 OCT	Columbus Day		HOLIDAY
	W	12 OCT	Quiz 3 (Lessons 5 & 6)	Ch 5-6	QUIZ 3

	R	13 OCT	Lab 5: Skew T Log P Diagram Applications (continued)	LAB 5	
9	M	17 OCT	Lesson 7: Precipitation	Ch 7	
	W	19 OCT	Lesson 7: (continued)	Ch 7	
	R	20 OCT	Lab 6: Satellite and Radar Imagery Analysis	LAB 6	Labs 5 Due
10	M	24 OCT	Lesson 8: Air Pressure, Forces and Winds	Ch 8	
	W	26 OCT	Lesson 8: (continued)	Ch 8	
	R	27 OCT	Lesson 8: (continued)	Ch 8	Lab 6 Due
11	M	31 OCT	Review for Quiz 4 (Lessons 7, 8)	Review	
	W	02 NOV	Quiz 4 (Lessons 7, 8)	Ch 7-8	QUIZ 4
	R	03 NOV	Lab 7: Upper Level Charts: Advection, Troughs & Ridges, Jet Streams	LAB 7	
12	M	07 NOV	Lesson 9: Small Scale and Local Winds	Ch 9	
	W	09 NOV	Lesson 9: (continued)	Ch 9	
	R	10 NOV	Lab 8: Upper Level Charts: Advection, Troughs & Ridges, Jet Streams	LAB 6	Lab 7 Due
13	M	14 NOV	Lesson 10: Global Wind Systems	Ch 10	
	W	16 NOV	Lesson 10: (continued)	Ch 10	
	R	17 NOV	Lesson 11: Air Masses and Fronts	Ch 11	
14	M	21 NOV	Review for Quiz 5 (Lessons 9, 10, 11)	Review	
	W	23 NOV	Quiz 5 (Lessons 9, 10, 11)	Ch 9, 10, 11	QUIZ 5
	R	24 NOV	Thanksgiving		HOLIDAY
15	M	28 NOV	Lab 8: Cold, Warm & Occluded Frontal Analysis	LAB 8	
	W	30 NOV	Severe and Tropical Weather Intro	Ch 14-15	
	R	01 DEC	Severe and Tropical Weather Intro	Ch 14-15	
16	M	05 DEC	Lab Practical Review		Lab 8 Due
	W	07 DEC	Course Review	Review	
	R	08 DEC	Lab Practical Exam	LABS 1-7	LAB PRACTICAL

17	M	12 DEC	Review and study day		
	TBD	Exam Day	Cumulative (labs excluded)	Ch 1-11	Final

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