

OFFICE OF ACADEMIC AFFAIRS
COURSE APPROVAL FORM
COURSE CHANGE



College: CoS Prefix/Subject Code: ESS Course Number: 112

Course Title: Severe & Hazardous Weather Credit Hours: 4 Cross Listed: _____

Nature of Change: _____ Effective Date: _____
(Check all that apply)

Add to Charger Foundations

Course Title Change

Old Title:

New Title:

Course Number Change Old Number: 112 New Number: 212

Course Description Change

Old Description:

Weather systems, severe weather, hurricanes, weather forecasting, interpretation of current conventional surface-based, satellite and radar weather observations.

New Description:

Meteorological analysis and beginning forecasting of weather systems, severe weather, snowstorms, hurricanes, and tornadoes through the interpretation of surface, upper air, satellite, and radar weather observations. Strong emphasis placed on unique observations of severe weather from UAH radar and profiling systems.

Course Requisite Change

Old Requisite:

New Requisite:

Course Restriction Change

Old Restriction:

New Restriction:

Fee Change

Old Fee: _____

New Fee: _____

Move to Inactive

Return to Active

Delete

Justification of Change:

The change in title is proposed to more accurately reflect that this lab course is focused on the "analysis" not simply description of severe weather phenomena, in particular looking at UAH atmospheric science instrumentation and data and incorporating research into the class.

The change in course number will increase our ESS course offerings at the 200-level and material and assignments in class will be adjusted to be taught at the 200-level (see syllabus).

The course description reflects both of these changes.

Department Chair: *Lawrence D. Carey*

Digitally signed by Lawrence Carey
DN: cn=Lawrence Carey, o=UAH, ou=ATS,
email=chair@nsstcuah.edu, c=US
Date: 2016.10.14 09:26:07 -0500

Grad. Council: _____

College Dean: *Emanuel A. Waddell Jr.*

Graduate Dean: _____

College Curriculum Committee: *Emanuel A. Waddell Jr.*

Undergrad Curriculum Cmte: _____

Provost: _____

Charger Foundations Cmte: _____

Acknowledgements from other units:

Department Chair: _____

College Dean: _____

ESS 212 – Severe Weather Analysis

Course: ESS 212
Semester: Spring 20XX
Class Time: T,R 09:35 – 10:55
Class Location: CH 4065
Lab Instructor: TBA
Lab Location: CH 4085

Instructor: Mr. Ryan Wade
Office: SWIRLL 120
Office Hrs: MWF 8:00-9:00, 13:30-15:30
TR 11:00 – 13:00
Email: ryan.wade@uah.edu
Office Phone: 256.824.4026

Course Description:

Meteorological analysis and beginning forecasting of weather systems, severe weather, snowstorms, hurricanes, and tornadoes through the interpretation of surface, upper air, satellite, and radar weather observations. Strong emphasis placed on unique observations of severe weather from UAH radar and profiling systems. Lab Required. Prerequisite: ESS 111

Course Goals:

1. Improve understanding of general meteorology (atmospheric science).
2. Develop an understanding of severe and hazardous weather processes.
3. Analyze and interpret measurements of hazardous weather available to NWS forecasters and UAH researchers.
4. Develop skill in forecasting (at an elementary level) severe and hazardous weather, and visually identifying hazardous weather.

The course will examine all aspects of high impact weather using current information, resources (book, web), and cutting edge measurements that are unique to the Huntsville meteorological community (UAH, NASA, NWS, Redstone Arsenal).

Additional notes on the prerequisites:

- a) A good knowledge of algebra (Algebra II at the High School level) is required.
- b) Many problems, projects, and lab exercises will require access to the world wide web. Please see me if you have limited access.

About the labs:

The labs associated with this class are designed to both enhance your understanding of lecture material, as well as to introduce some material that we simply don't have time to cover in lecture. As such, the labs don't always coincide exactly with what is going on in lecture. The lab section will make up 25% of your final grade for this class. Your Lab Instructor will have more information for you when you attend your first lab.

Required Text and Materials:

1. *Severe and Hazardous Weather: An Introduction to High Impact Meteorology*, 4th Ed. (R. Rauber, J. Walsh, and D Charlevoix, 2008, Kendall-Hunt Publishing Company, 612 pp., with CD) ISBN 978-0-7575-5339-4
2. *Severe and Hazardous Weather: An Introduction to High Impact Meteorology*, 2nd Ed., Active Learning Exercises (R. Rauber, J. Walsh, and D Charlevoix, 2005, Kendall-Hunt Publishing Company, 211 pp., with CD) ISBN 978-0-7575-5162-8

Additionally, you will be expected to access lecture notes, readings, assignments, and quizzes from the course web site in Canvas.

Attendance

Roll will be taken every day. Students are encouraged to attend ALL lectures as we will review key concepts from each lecture topic and some material that are not included in the powerpoint notes. Each class will build upon ideas learned in the previous classes. Lectures will also include periodic guest speakers, whose lecture topics will also be included on exams. Attendance during guest lectures is mandatory. If a student must miss class for a medical reason or for an officially sanctioned University student activity (those identified by the Provost), he/she should let the instructor know as soon as possible, and communicate with fellow classmates to obtain missed lecture material.

Grading:

Grades will be assigned based on the following percentages:

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

Exam 1	15%
Exam 2	15%
Exam 3	15%
Homework Quizzes	15%
Case Study – Severe Weather Event Analysis	15%
Lab Exercises and Analyses	25%

***Missed Class Penalty: -10% for every 5 unexcused absences ***

Missed Class / Exam / Quiz / Assignment Policy

Make-up exams and quizzes will not be given except for an illness documented by a physician, official college sponsored activities with appropriate documentation, or a death in the immediate family with a note from the Dean's office.

Homework Quizzes

Students will be responsible for answering assigned homework questions, but these homework assignments will not be directly handed in to the instructor. Rather, you will take an open notes online quiz through the course's Canvas webpage and will be available generally starting Monday of each week and will be due each week (except where noted) on Friday at 5pm. Canvas will stop accepting submission at 5pm on Friday, but bear in mind that it's a good idea to get these completed well ahead of time. If for some reason Canvas gives you technical problems and you can't submit answers to the questions, you **MUST** document this in an email to IT prior to 5pm on Friday if you want us to consider allowing you additional time to complete the questions, though don't expect this excuse to work more than once during the semester. Otherwise, these questions **MUST** be turned in on time for credit, and late assignments will not be accepted. There will be approx. 8-10 of these weekly question assignments, and together they will count for 15% of the final grade in the course.

Computers in the Lab

Use of the computers in the lab is for class assignments and assigned learning activities only.

Complaint Procedure:

If you have difficulties or complaints related to this course, your first action usually should be to discuss them with me. If such a discussion would be uncomfortable for you or fails to resolve your difficulties, you should contact Dr. Larry Carey, Chair of the Atmospheric Science Department. Dr. Carey's office is NSSTC, Room 4042. His telephone number is (256) 961-7872. If you are still unsatisfied, you should discuss the matter with Dr Emanuel Waddell, Associate Dean of the College of Science. The Associate Dean's office is located in C207 of the Materials Science Building (MSB). His phone number is (256) 824-6844 and email address is adeancos@uah.edu.

UAlert Emergency Notification System:

UAHuntsville has implemented the UAlert emergency notification system. UAlert allows you to receive time-sensitive emergency messages in the form of e-mail, voice mail, and text messages. Everyone who has a UAHuntsville e-mail address will receive emergency alerts to their campus e-mail address. In order to also receive text and voice message alerts, you are asked to provide up-to-date phone contact information. Participation in UAlert text and voice messaging is optional, but enrollment is strongly encouraged. **You can't be reached through UAlert unless you participate.** The information you supply is considered confidential and will not be shared or used for purposes other than emergency notification. To review your UAlert account, add or update phone and alternate e-mail addresses, and set the priority for your contact methods, please visit the UAlert web site: <http://ualert.uah.edu>.

Disability Services:

I would like to hear from anyone who has a disability that may require some modification of seating, testing, or other class procedures. Please see me after class or during my office hours to discuss appropriate modifications. In order to obtain exam or assignment accommodations, the student must provide me with a *letter of accommodation* within the first two weeks of class. More information can be obtained by contacting the Office of Disability Support Services at 256.824-1997 (dssproctor@uah.edu). <http://www.uah.edu/health-and-wellness/disability-support>

Academic Misconduct

From the Code of Student Conduct in the UAH Student Handbook (<http://www.uah.edu/dos/student-conduct/handbook>), academic misconduct is defined as follows.

7.2.1 Academic Misconduct

All forms of academic dishonesty, including, but not restricted to, the following:

- a. Copying from another student's exam paper.
- b. Using materials during a test not authorized by the person giving the exam.
- c. Collaborating or failing to prevent collaboration during a test with any other person by giving or receiving information without authority.
- d. Stealing, buying, or otherwise obtaining all or part of an exam.
- e. Selling or giving away all or part of an exam.
- f. Bribing any other person to obtain an exam or information about an exam.
- g. Substituting for another student, or permitting any other person to substitute for oneself, to take an exam.
- h. Submitting as one's own, in fulfillment of academic requirements, any theme, report, term paper, essay, or other written work; any speech or other oral presentation; any painting, drawing, sculpture, musical composition or performance, or other aesthetic work; any computer program; any scientific experiment, laboratory work, project, protocol, or the results thereof; etc., prepared totally or in part by another.
- i. Selling, giving, or otherwise supplying to another student for use in fulfilling academic requirements any work described above.
- j. "Plagiarism," defined as the use of any other person's work (such work need not be copyrighted) and the unacknowledged incorporation of that work in one's own work offered in fulfillment of academic requirements. This includes the use and incorporation, without acknowledgement, of the wording or expressions (even if paraphrased), information, facts, arguments, analysis, or ideas of another.
- k. Submitting in fulfillment of academic requirements, if contrary to course regulations, any work previously presented, submitted, or used in any course.
- l. Falsifying records, laboratory results, or other data used in a course.
- m. Cheating or deceit in any other manner.

Academic misconduct is serious; it erodes the academic integrity of our University and the value of a UAH degree. As such, instances of academic misconduct will be dealt with by the instructor according to Section 7.10 of the Student Code of Conduct. Academic sanctions can be imposed by the instructor that are appropriate to the circumstance and can be as severe as awarding an 'F' for the relevant graded assignment or even for the entire course.

Most examples of academic misconduct are obvious. *However, some issues such as proper attribution and referencing in your work may raise some legitimate questions. If you have any questions regarding academic misconduct issues (e.g., plagiarism etc.), please feel free to ask the instructor for a clarification.* Although students are ultimately responsible for their own conduct, the instructor is available to help you avoid academic misconduct in the completion of assignments.

Cell Phone and Other Portable Electronic Devices (laptops, tablets, pads) Policy

In order to facilitate a productive teaching and learning environment, cell phones voice, texting, web, and Internet Apps capabilities are not to be used during class period. Please mute your cell phone if you bring it to class. If your phone rings/beeps, then please quickly mute it. Unless otherwise approved by the instructor, portable electronic devices, (smart phones, laptops, tablets, and pads) are allowed for electronic note taking only.

Changes in Course:

Since all classes do not progress at the same rate, the instructor may wish to modify the above requirements or tentative schedule as circumstances dictate. For example, the instructor may wish to change the number and frequency of exams, or the number and sequence of assignments. However, the students must be given adequate notification. Moreover there may be non-typical classes for which these requirements are not strictly applicable in each instance and may need modification. If such modification is needed, it must be in writing and conform to the spirit of this policy statement.

Course Content and Tentative Schedule:

Please note that changes to this schedule will likely change as the semester progresses. A more detailed schedule will be posted and regularly updated on the course Canvas web site.

<i>Lecture</i>	<i>Lab</i>	<i>Date</i>	<i>Chapter</i>	<i>Description</i>
Week 1				
	0			NO LAB
1		1/7	1 (pp 1-15)	Syllabus Day! Review: Atmospheric Composition
Week 2				
2		1/12	1 (pp 1-15)	Review: Atmospheric Composition
	1			LAB: Atmos Composition, Weather Observations & Analysis
3		1/14	1 (pp 1-15)	Review: Atmospheric Composition
Week 3				
4		1/19	2 (pp 17-39)	Meteorological Measurements, Radar, Satellite
	2			LAB: Stability, Soundings, & Radar
5		1/21	14 (223-234)	Lake Effect Snow
Week 4				
6		1/26	4, Notes	Lake Effect Snow
	3			LAB: Meteorological Measurements & Lake Effect Snow
7		1/28	9,10 (155-186)	Review: Air Masses, Fronts, Mid-Latitude Cyclones
Week 5				
8		2/2	12, Notes	Winter Precipitation Type
	4			LAB: Mid-Latitude Cyclones
9		2/4	12 (207-219)	Ice Storms
Week 6				
10		2/9	11 (189-204)	Nor'Easters, Gulf Lows, & Blizzards
	5			LAB: Determining Precipitation Type and Ice Storms
11		2/11		EXAM #1
Week 7				
12		2/16	18 (305-310)	Thunderstorms: Ingredients/Structure, Mardi Gras Wx History
	6			LAB: Nor'Easters and Sub-Tropical Lows (Sandy)
13		2/18	18, Notes	Thunderstorms: Types & Spatial Distribution
Tentative Course Outline Continued On Next Page				

Week 8				
14		2/23	18 (305-320)	Mesoscale Convective Systems: Structure & Types
	7			LAB MID-TERM EXAM
15		2/25	21 (305-320)	Mesoscale Convective Systems: Squall Lines
Week 9				
16		3/1	22	Supercell Thunderstorms: Ingredients, Stability, & Shear
	8			LAB: Thunderstorms – Initiation, Structure, Spatial Distribution
17		3/3	20	Supercell Thunderstorms: Structure, Propagation, & Impacts
Week 10				
18		3/8	19	Severe Windstorms: Downbursts & Bow Echoes
	9			LAB: Mesoscale Conv/ Systems: Structure, Impacts, Warnings
19		3/10	handouts	Severe WindStorms: Derechoes
Week 11				
20		3/15		Lightning
	10			LAB: Supercells - Structure, Impacts, Warnings
21		3/17		EXAM #2
Week 12 - SPRING BREAK				
		3/24		Spring Break – Sea Breeze Studies!
		3/26		Spring Break – Sea Breeze Studies!
Week 13				
22		3/29		Tornadoes: Formation, Structure, Environment
				LAB: Tornado Classification and EF-Scale Damage Rating
23		3/31	25	Tornadoes: Outbreaks, Damage Rating, EF-Scale
Week 14				
24		4/5	24	Hurricanes: Ingredients, Structure, Impacts
				LAB: Hurricanes - Structure and Impacts
25		4/7	26, 27	Hurricanes: Formation, Intensity, Eyewall Replacement Cycles
Week 15				
26		4/12		Hurricanes: Forecasting – Track vs Intensity
				LAB: Hurricanes - Forecasting & NHC Products
27		4/14		Hurricanes: NHC Products & Societal Impacts
Week 16				
28		4/19	Reports	Reports of case studies
29		4/21	Reports	Reports and Review (last class)
FINAL EXAM				
30		Tue 4/26		Final Exam, 8:00am – 10:30am