

ATMS 315 SATELLITE and RADAR METEOROLOGY**Spring 2009**

- DESCRIPTION:** Topics include theories and applications of remote sensing techniques.
- INSTRUCTOR:** **Dr. Huo-Jin (Alex) Huang**, RBH 236B, Dept. of Atmospheric Sciences, UNCA
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Office Hours: Monday Wednesday 11-11:30 am; Tuesday, Thursday 12:45-1:30 pm.
(or by appointment, but walk-in is always welcome)
- TEXT:** **An Introduction to Satellite Image Interpretation** (1997), by Eric Conway (EC) and The Maryland Space Grant Consortium.
Radar for Meteorologist (2004), 4th edition, by Ronald E. Rinehart (RR).
- SCHEDULE:** 9:25 – 10:40 am, Tuesday and Thursday, RBH 238.
- EXAMS:** 1st Test: 2/17; 2nd Test: 3/31;
Final Exam: 8:00-10:30 am, Tuesday, May 12, 2009.
- GRADING:** **Assignments: 20%; 2 Tests: 30%; 1 student presentation: 10%; 1 term paper: 15%, Classroom participation: 5%; and Final exam: 20%.**
- GRADE SCALE (100%):** A \geq 93; A-: 92.5-90; B+: 89.5-87; B: 86.5-83; B-: 82.5-80;
C+: 79.5-77; C: 76.5-73; C-: 72.5-70; D+: 69.5-67; D: 66.5-60; F: \leq 59.5.

SPECIAL REMARKS: Each assignment is due in a week, unless otherwise indicated. Class attendance is strongly recommended. You are solely responsible for the consequences due to your absence. No late assignments will be accepted; no make-up tests will be given. Exception may be granted for uncontrollable circumstances and medical reasons. You have to consult with the instructor at your earliest convenience for exceptions. A significant reduction of your score on your late homework may be applied. You will receive an F for the semester if you miss more than 5 class periods without any justifiable and excusable reasons.

NOTE: This syllabus is subject to any reasonable modifications by the instructor with the consent of students.

ATMS 315 COURSE OUTLINE

Satellite Meteorology (Weeks 1-9)

<u>WEEK</u>	<u>DATES</u>	<u>SUBJECT</u>	<u>Chapter in EC</u>
1	1/15	The Atmosphere	5
1	1/19	Martin Luther King, Jr. Day, NO CLASS	
1, 2	1/20, 1/22	Foundations of Remote Sensing	1
2	1/27	The Satellites	2
3	1/29, 2/3	The Basics of Image Interpretation	3
4	2/5, 2/10	Identifying Cloud Types	6
5	2/12	Determining Wind Direction	7
5	2/17	1st Test	
6	2/19	Global Circulation	8
6	2/24	Jet Stream	9
7	2/26	Synoptic-scale Storms	10
8	3/3	Thunderstorms	11
8	3/5	Tropical Cyclones	12
8, 9	3/7- 3/15	SPRING BREAK	

Radar Meteorology (Weeks 9-16)

<u>WEEK</u>	<u>DATES</u>	<u>SUBJECT</u>	<u>Chapter(s) in RR</u>
9	3/17	History of Radar	1
10	3/19, 3/24	Radar Basics and Microwaves	2, 3
11	3/26	Term Paper is due	
11	3/26	Point and Distributed Targets	4, 5
11	3/31	2nd Test	
12	4/2	Point and Distributed Targets	4, 5
12	4/7	Student presentations	
13	4/9, 4/14	Reflectivity and Rain rate estimates	
14	4/16, 4/21	Doppler Velocity	6
15	4/23, 4/28	Meteorological Targets	8
16	4/30	Future Doppler Radar	13
17	5/12	Final Exam, 8 – 10:30 am, Tuesday	

ATMS 315 **Guideline for Report**

The subject of the project should be related to any satellite and radar meteorology. The review of a current theory, and/or a case study of a special weather event are acceptable. The goal of this project is to let you learn the methodology of research, and the presentation of the research results. The instructor will always be there to help you with the materials, data collection, preparation, and writing of manuscripts. It is your responsibility to initialize the research, to search and construct the weather data, and to finish the project. If you encounter any problems, you should contact the instructor for further assistance as soon as possible.

The style and format of the report should be like the scientific papers printed in any meteorological journals, such as Monthly Weather Review. It should include:

- a. The title page: It should list: the title of the paper, the author and academic affiliation, including city and state, and the month and year of writing.
- b. The abstract: It should summarize important information and findings from the article or note such as purpose, methodology, results, and conclusions.
- c. The text: It should be at least five (5) typed double-spaced pages long, but no longer than 8 pages. It should begin on the next page after the abstract, and should be divided into following logical sections. Each section should be numbered consecutively and have a section heading, such as:
 1. Introduction
 2. Data analysis or theory
 3. Results and discussion
 4. Conclusion, summary, or concluding remarksAcknowledgements (if necessary)
Appendices (if necessary)
List of references
List of figures and/or tables
- d. Each page in the text should be numbered starting with the instructor. Acknowledgements, appendices, and list of references are section headings that are not numbered.
- e. Figure caption must be listed at the bottom of each figure. The caption should describe the figure, and draw attention to key features.
- f. Figures should be cited in the text in numerical sequence. All characters, labeling, and lines (including map backgrounds) must be dark enough to promote readability.
- g. Tables should be cited in the text in numerical sequence. Each table must have a title and at least two columns and two rows of data, with the data centered under each column heading.
- h. Units of measure used in meteorology in the United States are recommended. For example, wind speed in knots (kt) or statute miles per hour (mph), pressure in millibar (mb), surface temperature and dew point in °F, distance in statute miles (mi) or nautical miles (n mi), and precipitation amounts in inches (in) are permissible, while upper air temperature and dew point should be expressed in °C. However, the International System of Units (SI, such as m, kg, s, K) may also be used.

The timeline for completing the term paper:

1. The subject you choose should be approved by and discussed with the instructor by Thursday, February 5, 2009.
2. The paper should be completed and turned in to the instructor by Monday, March 26, 2009.
3. Students will make in-class presentations on April 7, 2009. Each presentation is limited to 15 minutes.

The planned schedule for your term paper is:

1/15-2/5/2009 Perform the survey of Subjects and Topics, and discuss your ideas with the instructor.

2/5 Determine the subject, references, and source of data.

3/3 Finish the Draft, and turn it in for any suggestions or comments.

3/26 Turn in the final version of term paper.

4/7 In-class presentations (15 minutes each)