ATMOSPHERIC SCIENCES 360 SPRING 2026
ATMOSPHERIC INSTRUMENTATION

Taught by: Pat Arnott. Office hours 1-3 pm Wednesday and by appointment.

Contact: arnottw@unr.edu.

Course Administration: http://www.patarnott.com/atms360/ and webCampus.

Time and Place: MWF 9-9:50am and Room 113 of Leifson Physics.

Course reading material will be delivered to students via the website listed above.

Catalog Description: Introduction to atmospheric sensor design, physical principles of measurement, signal processing, and hands-on experience with radiometers, acoustic sounders, radar, lidar and satellite remote sensing methods.

Student Learning Outcomes:

1. Review and learn how to communicate atmospheric science measurements, both in written and oral formats. We will build skills for manipulating and visualizing atmospheric science data sets, and students will have ample opportunities for writing and presenting scientific reports.
2. Students will learn about atmospheric science instruments for measuring wind, pressure, temperature, humidity, solar radiation, infrared radiation, and aerosol properties.
3. Students will learn how to perform atmospheric science case studies for specific events such as high air pollution days or days with strong precipitation.

Course Objectives:

We will systematically move through the steps needed to analyze atmospheric science data, to use and understand instruments, and to develop case studies.

1. Meteorological Case Studies.
2. National Weather Service weather radars.
3. Arduino microcontroller system for learning about how to acquire your own atmospheric measurements.
4. Operating principles of commonly used atmospheric instruments.
5. Visit the National Weather Service Office and observe a radiosonde launch if possible.

General Description

Atmospheric instruments are needed to study climate, air quality, air motion, clouds, sunlight, infrared radiation, and interfaces such as the atmosphere with the ocean and land. These instruments measure phenomena over a very wide range of sizes from the molecular level, to the planetary scale. Measurements that are used to monitor climate must be very stable and accurate over many years so that subtle changes can be

inferred. Economic and sociological decisions are likely to be made in the future based at least somewhat on the story brought forth by these instruments. We will discuss broad categories of instruments in this class covering most of these length and time scales and will also discuss remote sensing, for example, from satellites.

GRADING:
Attendance and participation: 20%.
Attendance and participation is vital for this course; therefore, *each official class meeting where you are expected to attend class will be worth 10 points.* Excused absences need to be worked out beforehand, and it's the student's responsibility to make up any missed classes or events. **Certain events and classes will be extremely difficult to make up.**

Laboratory write-ups, MetEd modules, and presentations: 80%

Semester grades will be given using the following percentage guide:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
90%-100%	89%-89.9%	88%-88.9%	80%-87.9%	79%-79.9%	78%-78.9%	70%-77.9%	69%-69.9%	68%-68.9%	60%-67.9%	59%-59.9%	0-58.9%

Work Together:
I ***strongly*** suggest that you work together with other students on projects and homework. Find a lab partner or group and take advantage of the synergy provided by group brainstorms. At the same time, each student needs to be fully competent with the skills and knowledge developed in this class.

University Policies

Statement on Academic Dishonesty

The University Academic Standards Policy defines academic dishonesty, and mandates specific sanctions for violations. See the University Academic Standards policy: UAM 6,502.

Statement on Student Compliance with University Policies

In accordance with section 6,502 of the University Administrative Manual, a student may receive academic and disciplinary sanctions for failure to comply with policy, including this syllabus, for failure to comply with the directions of a University Official, for disruptive behavior in the classroom, or any other prohibited action. “Disruptive behavior" is defined in part as behavior, including but not limited to failure to follow course, laboratory or safety rules, or endangering the health of others. A student may be dropped from class at any time for misconduct or disruptive behavior in the classroom upon recommendation of the instructor and with approval of the college dean. A student may also receive disciplinary sanctions through the Office of Student Conduct for misconduct or disruptive behavior, including endangering the health of others, in the classroom. The student shall not receive a refund for course fees or tuition.

Statement of Disability Services

For Traditional and Seated Classrooms:

Any student with a disability needing academic adjustments or accommodations is requested to speak with me or the Disability Resource Center (Pennington Achievement Center Suite 230) as soon as possible to arrange for appropriate accommodations.

For Online Courses:

If you are a student who would normally seek accommodations in a traditional classroom, please contact me as soon as possible. You may also contact the Disability Resource Center for services for online courses by emailing drc@unr.edu or calling 775-784-6000. Academic accommodations for online courses may be different than those for seated classrooms; it is important that you contact us as soon as possible to discuss services. The University of Nevada, Reno supports equal access for students with disabilities. For more information, visit the Disability Resource Center.

This course may leverage 3rd party web/multimedia content, if you experience any issues accessing this content, please notify your instructor.

Statement on Audio and Video Recording

Student-created Recordings

Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped, or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.

Instructor-created Recordings

Class sessions may be audio-visually recorded for students in the class to review and for enrolled students who are unable to attend live to view. Students who participate with their camera on or

who use a profile image are consenting to have their video or image recorded. If you do not consent to have your profile or video image recorded, keep your camera off and do not use a profile image. Students who un-mute during class and participate orally are consenting to have their voices recorded. If you do not consent to have your voice recorded during class, keep your mute button activated and only communicate by using the "chat" feature, which allows you to type questions and comments live.

Statement on Maintaining a Safe Learning and Work Environment

The University of Nevada, Reno is committed to providing a safe learning and work environment for all. If you believe you have experienced discrimination, sexual harassment, sexual assault, domestic/dating violence, or stalking, whether on or off campus, or need information related to immigration concerns, please contact the University's Equal Opportunity & Title IX office at 775-784-1547. Resources and interim measures are available to assist you. For more information, please visit the Equal Opportunity and Title IX page.

Statement on Campus Closures or Delays

In the event of class cancelations or delays caused by inclement weather conditions, fire/smoke conditions, or other unforeseen emergencies, the safety and well-being of students are the University's top priority. Official notifications will be disseminated through the University website and other official channels with details related to any campus delays or closures.

In the event of a campus closure, you will be informed as to whether the class will be offered remotely or if it will be canceled. If the class is cancelled, you will receive information on how to address any missed course content. We will most likely use Zoom if campus is closed.

Students facing significant impacts due to these events are encouraged to communicate with their instructor for potential accommodations.

Additional Information

- Your student fees cover usage of the University Math Center (https://www.unr.edu/university-math-center), (775) 784-4433; University Tutoring Center (https://www.unr.edu/tutoring-center), (775) 784-6801; and University Writing & Speaking Center (https://www.unr.edu/writing-speaking-center), (775) 784-6030. These centers support your classroom learning.