General Meteorology

Meteorology 3010 – Spring 2025

Class meetings: MWF, 8:50 am – 9:40 am, 2020 Agronomy Hall
T, 9:00 am – 9:50 am, 2020 Agronomy Hall

Prerequisites: Math 1660, Credit or Enrollment in Physics 2320.

Instructor: Dave Flory
Office: 3101 Agronomy Hall
Phone: 294-0264
Email: flory@iastate.edu
Office hours: By appointment (see websites).

Website: Canvas and at http://www.meteor.iastate.edu/classes/mt301

Course Goals

- Understand the fundamental physical and mathematical principles of meteorology
- Design and implement an authentic research experience
- Begin developing self-learning skills needed for life-long professional development

Course Design

The provided course outline is tentative but should be adequate to give you a reference for the order of topics and a reasonable idea of the course's pace. Please come to class prepared to participate actively in the learning process. This interactive class will have many opportunities to engage directly with your peers. For this to work, I expect that everyone attend class, show up on time, and be mindfully present. Being active and engaged in class will give you the most profound learning experience.

As in any professional organization, promptness is a standard procedure. Justify any absences beforehand by talking to or emailing the instructor. Please give your best effort to your homework, do it with pride, and submit it on time. Late homework will ***not*** be accepted.

Texts

Required: *Atmospheric Science: An Introductory Survey*, Wallace and Hobbs, 2nd ed., Elsevier Inc., ISBN-13: 978-0-12-732951-2.

Required: Familiarity with TopHat.

Email

I frequently communicate with the class through Canvas and occasionally by email. The default email address I have for all students is their @iastate.edu address. Students who prefer another email address should automatically forward your iastate.edu email to the other system.

This approach is preferable because faculty teaching other courses will also use email to communicate with you. They will also have your iastate.edu address through Workday, but not likely your alternate email address. Setting up automatic forwarding saves you from repeating these steps down the road.

Structure of Classes

Many classes will involve traditional lectures. However, some will be much more interactive, and we will work on class review problem sets. I will post these problem sets under a link on the course webpage or list them in class. In these instances, students will learn the material from the textbook and work on these problems before class, and I will spend short periods working with each group on the assigned questions.

NOTE: If we do not finish a derivation during class, students will be responsible for completing it independently. (Nearly all derivations are in the textbook.)

Procedure for Standard Problem Sets

Please follow these procedures for doing problem sets:

1. Label the problem.
2. Work on the problem and include comments.
3. Identify the solution (e.g., underline, put in a box, use an arrow pointer, etc.)
4. Make sure your name is on each sheet of paper.

- Occasionally, I may randomly call on students to explain problem solutions to the class.
- Neatly staple your homework and remove jagged edges. Please do not use "dog ears" or paper clips.

Problem sets are due at the beginning of class, roughly one week after the assignment is given (unless stated otherwise).

Current Events Activities

Periodically throughout the semester, students will select a current events article from a list provided by the instructor and write a summary and reflection on the piece. These exercises aim to raise awareness of atmospheric science's trending topics and controversies. These assignments fall in the category of problem sets/in-class assignments in the grading scheme (below). Please review the course GenAI (Generative Artificial Intelligence) statement.

Procedure for Class Review Problem Sets

These will be problems that I want you to work on in groups in advance of classes where the material is covered. There are two motivations for these sets:

- To allow us to work on problems together in class.
- To give further incentive for self-learning independently and in collaboration with your problem-set group.

NOTE! Hand in-class review problem sets at the end of the next class after they are covered.

Inquiry-Based Lab

This semester, you will create and participate in a class research project. The project models an authentic research project to help you understand how scientists perform research and address several common misconceptions associated with doing scientific research.

As a part of a small group of students, you will develop a hypothesis or a scientific question using scientific data available online or data obtained using instrumentation available to the class. We will devote roughly one day a week to the lab throughout the semester and learn more about the project's details during the first week of the course.

Grading

- Exams - 2 (22.5% each): 45%
- Final exam (cumulative): 30%
- Problem Sets/In-Class Assignments: 15%
- Inquiry-Based Lab: 10%

The course grade is determined by how each student performs. I do this by comparing student work and how the class has done compared to past years. This approach gives a starting point for reviewing each student's grasp of the material. I will not judge the total score from tests, labs, etc., on a linear or straight scale (below 60 = F, 60 - 69 = D, etc.)

You are welcome to question/dispute any grades up to one week after posting. After one week, all marks are final. This approach ensures the grading method used by the instructors is fresh in their minds when evaluating any potential corrections.

Generative Artificial Intelligence

This course assumes that all work submitted by a student will be generated independently by the student or as part of an assigned group. Any substantive portion of an assignment done by someone else, **including AI-generated content**, is prohibited and will be treated as academic misconduct. The instructor may occasionally allow Gen AI tools for an assignment. Specific instructions will be included for this assignment. When in doubt, the best approach is to ask the instructor and assume that AI-generated content is not allowed until you hear otherwise.

Public Health

If you are not feeling well, you should stay home and focus on your health. If you miss class due to illness, you must work with your instructor to arrange accommodations and makeup coursework consistent with the instructor's attendance policy.

Mental Health and Well-Being Resources

At Iowa State, we're committed to your success and well-being. As a Cyclone, you can access 24/7 resources, services, and people dedicated to helping you achieve your goals and be your best in and out of the classroom. Whether you need academic support or just someone to talk to, we're here for you at Cyclone Support (cyclonesupport.iastate.edu). If you are struggling emotionally and need support, there's confidential help available 24/7/365. You can call or text 988 or use the chat at 988lifeline.org.

Academic Dishonesty

The class will follow Iowa State University's policy on academic misconduct (**5.1 in the Student Code of Conduct**). Students are responsible for adhering to university policy and the expectations in the course syllabus and on coursework and exams and for following directions given by faculty, instructors, and ISU Test Center regulations related to coursework, assessments, and exams. Anyone suspected of academic misconduct will be reported to the **Office of Student Conduct in the Dean of Students Office**. Information about academic integrity and the value of completing academic work honestly can be found in the **Iowa State University Academic Integrity Tutorial**.

Cell phone use will not be allowed on exams. Allowed materials are a calculator, a writing utensil, and an eraser.

Free Expression

Iowa State University supports and upholds the First Amendment protection of **freedom of speech** and the principle of **academic freedom** in order to foster a learning environment where open inquiry and the vigorous debate of a diversity of ideas are encouraged. Students will not be penalized for the content or viewpoints of their speech as long as student expression in a class context is germane to the subject matter of the class and conveyed in an appropriate manner.

No employee, student, applicant, or campus visitor is compelled to disclose their pronouns. Anyone may voluntarily disclose their own pronouns.

Classroom Disruption

Disruptive conduct at the instructor's discretion includes a single serious incident or persistent conduct that unreasonably interrupts, impedes, obstructs, and/or interferes with the educational process. Disruptive conduct may be physical and/or expressive and occur in person or virtual. Disruptive conduct includes but is not limited to, the following: receiving texts or cell phone calls during class, leaving class early or coming to class habitually late, eating in class, talking

out of turn, doing assignments for other classes, reading the Iowa State Daily, sleeping, and engaging in other activities that detract from the learning experience. Any continued class disruption will result in a report to the Office of Student Conduct in the Dean of Students's Office for a possible ISU Code of Student Conduct infraction. After one warning, if the disruption continues, you will be asked to leave the learning space for the remainder of the class.

Accessibility Statement

Iowa State University is committed to advancing equity, access, and inclusion for students with disabilities. Promoting these values entails providing reasonable accommodations where barriers exist to students' full participation in higher education. Students in need of accommodations or who experience accessibility-related barriers to learning should work with Student Accessibility Services (SAS) to identify resources and support available to them. Staff at SAS collaborate with students and campus partners to coordinate accommodations and to further the academic excellence of students with disabilities. Information about SAS is available online at **www.sas.dso.iastate.edu**, by email at **accessibility@iastate.edu**, or by phone at 515-294-7220.

Statement on Prep Week

This class follows the Iowa State University Prep Week policy, as noted in the ISU Policy Library and the Senior Vice President and Provost's website.

Discrimination and Harassment

Iowa State University does not discriminate on the basis of race, color, age, ethnicity, religion, national origin, pregnancy, sexual orientation, gender identity, genetic information, sex, marital status, disability, or status as a U.S. Veteran. Inquiries regarding non-discrimination policies may be directed to Office of Equal Opportunity, 2680 Beardshear Hall, 515 Morrill Road, Ames, Iowa 50011, Tel. 515-294-7612, Hotline 515-294-1222, email **eooffice@iastate.edu.**

Religious Accommodation

Iowa State University welcomes diversity of religious beliefs and practices, recognizing the contributions differing experiences and viewpoints can bring to the community. There may be times when an academic requirement conflicts with religious observances and practices. If that happens, students may request the reasonable accommodation for religious practices. In all cases, you must put your request in writing. The instructor will review the situation in an effort to provide a reasonable accommodation when possible to do so without fundamentally altering a course. For students, you should first discuss the conflict and your requested accommodation with your professor at the earliest possible time. You or your instructor may also seek assistance from the **Dean of Students Office** at 515-294-1020 or the **Office of Equal Opportunity** at 515-294-7612.

Contact Information

If you are experiencing or have experienced a problem with any of the above issues, email academicissues@iastate.edu.

Miscellaneous

- Please make sure your cell phones and any other noisemakers are off before coming to class.
- Texting in class is rude and disrespectful.
- Laptops can be a distraction. You are welcome to use them to take notes or view class-related material. Otherwise, they are a distraction.
- Please check the class website for important dates regarding the class schedule. We might not have class these days due to the instructor's absence.

The tentative time of the final exam is Tuesday, May 13, 7:30 – 9:30 am in our regular classroom (2020 Agronomy Hall).