SCI 222 Meteorology
Project IV

Purpose
Demonstrate your understanding of the physics of weather processes.

What it is
Your project is a formal way to demonstrate that you understand the content covered in Unit IV of the course. It should thoroughly fulfill at least two of the unit objectives.

Unit IV objectives
1. Describe the characteristics and behaviors of the types of midlatitude air masses.
2. Identify the driving energy contrast of midlatitude cyclones.
3. Describe the development and dissipation of midlatitude cyclones, including the progress of fronts and the influence of the jet stream.
4. Describe the weather patterns resulting from a midlatitude cyclone.
5. Identify the energy contrast powering thunderstorms.
6. Describe and explain the life cycle of an ordinary thunderstorm.
7. Explain the role of wind shear in intensifying and prolonging thunderstorms.
8. Explain how lightning forms and how to best promote lightning safety.
9. Describe the formation of supercells and tornadoes.
10. Identify the energy contrast powering tropical cyclones.
11. Describe the structure and processes of a mature tropical cyclone.
12. Describe the development, track, and dissipation of a tropical cyclone.
13. Describe and explain the ways in which cyclones threaten people and property.
14. Explain the principle of numerical weather forecasting, and the uncertainties in the resulting forecasts.
15. Explain the limits to forecasting imposed by the chaotic nature of atmospheric dynamics.
16. Explain how ensemble forecasting helps to quantify the uncertainty in forecasts.
17. Explain the role of a (human) meteorologist in weather forecasting.

Possible projects
These are some ideas for a project. You are free to suggest others. I will approve of projects that demonstrate your mastery of the required unit objectives.

- An account of a noteworthy storm, such as a tornado, midlatitude cyclone, or hurricane, including explanation of how it formed and developed.
- A brochure promoting lightning safety.
- A seven-day weather forecast, with explanation of how the forecast was created from the numerical models.
- A poster explaining numerical weather forecasting.
- A brochure explaining hurricane hazards and preparation.

Graded Components

Sign up: Select a project. Describe succinctly what form your project will take, and which unit objective(s) it will cover.

Check-in: Give an overview of your project in more detail than your sign-up. Depending on the nature of your project, this may be a rough draft, or a conference with the instructor. You will be notified after your sign-up.

Final Draft: The completed project.

Dates and Deadlines

May 1	Project assigned
May 4	Sign-ups
May 11	Check-ins due
May 15–16	Work days
May 16	Project due

Scoring

Sign-up (7 points)

Tell me what you have in mind.

Feedback on the sign-up will include specifying the nature of the required check-in and a rubric for the specific project.

+3	Identifies the form of the project.
+2	Identifies the unit objective(s) addressed.
+2	Describes how the project will demonstrate mastery of the objective(s).

Check-in (18 points)

Show the progress made toward the project and clarify expectations.

+6	Provides evidence that the project will satisfy the objective(s).
+12	Demonstrate that the project is fully planned.

Final Project (100 points)

A more detailed rubric specific to your project will be provided after sign-up.

+15	Neat, creative, and visually appealing.
+50	Objectives are covered completely and correctly.
+15	Sources are properly cited, evaluated, and acknowledged.
+20	Organized and easily understandable.