

Knowledge Expectations for METR 4911/4922 Senior Seminar (Capstone)

Purpose: The Capstone course is designed to be the pinnacle of the undergraduate experience. Here students integrate and apply knowledge gained in their previous courses to an original research project of their choosing. Capstone provides opportunities to strengthen basic research, report writing, and presentation skills. In addition, Capstone provides opportunities to develop the professional skills needed by meteorologists in government, academia and the private sector.

Pre-requisites: Grade of C or better in METR 3123, METR 3223, senior standing. If taking METR 4922, a grade of C or better is required in METR 4911.

Goal of the course: This course is intended to satisfy the meteorology Capstone course requirement. The instructor will guide senior meteorology majors through a research project. Interdisciplinary topics will be encouraged, and library work will be required. Students will be paired with regular and adjunct faculty mentors. Senior doctoral students may serve as mentors with permission of the instructor. The result will be a written and oral presentation of the senior thesis. In addition, the instructor may present professional skills useful during the job search and interview phases as well as early employment. The skills will be useful whether the students are entering the job market or going to graduate school.

Knowledge Expectations

- Project management. Learn the basics of defining a research-worthy project and setting out a meaningful and realistic strategy for bringing it to a successful conclusion.
- Research group synergy. Learn the dynamics of participating in a group project; learn how to be a good individual investigator and a good team-mate.
- Proposal writing. Understand the proposal development and approval process by writing a mini-proposal and by seeking approval of a funding agency (the instructor).
- Literature search. Understand the need and process of placing research in proper perspective by performing a systematic literature search. Learn how to use the Science Citations/Web of Science online database and other tools to locate (i) articles by a specific author, (ii) articles on a given subject, (iii) articles that cite a specific study.
- Data gathering. Learn how to collect data, to search out and find data in federal repositories, and to discover data sources locally, in libraries, and via the Internet.
- Analysis. Understand how to approach a research problem and select and apply appropriate analysis methods. Learn how to draw conclusions from research.
- References. Learn how to properly attribute credit to the work of others. Gain familiarity with the current reference format used in journals of the American Meteorological Society and some other select publications.
- Organization, writing, and presentation graphics. Learn and apply the organization of a refereed journal article or scholarly report. Apply structured writing skills learned in technical writing classes. Learn how to create meaningful figures and tables to enhance communication.
- Oral and poster presentations. Learn how to create an effective oral presentation using proven software tools. Learn how to choose topics for discussion and adjust the level of

detail to match the allocated time of presentation. Learn how to create a poster using a large format printer/plotter or a collage of smaller images and word boards.

- Peer reviews. Learn the importance of peer review by evaluating the work of others (e.g., by critical review of oral or poster presentations).
- Graduate School Skills. Learn how to determine which schools are right for you, and how to approach the application process. Learn the skills and habits that will help you succeed in graduate study.
- Professional Skills. Learn resume writing and interview skills to land the job that interests you. Learn the work habits that will help you succeed in your career.
- Ethical Responsibilities. Understand the ethical responsibilities of undergraduate and graduate students, faculty, researchers in the government and the private sector, and project managers.