

METEOROLOGY (MT)

MT 1000 Introduction to Weather Community (1)

First-semester introduction to the meteorology major to help students transition to the college environment. Introduces (1) meteorology faculty, staff, and resources; (2) ideas for success, study skills, critical thinking, work ethic, and professionalism; and (3) careers in meteorology, including forecasting, research, and broadcasting. Round-table discussions; presentations by students and faculty. Pass/No Pass. Falls.
Prerequisite(s): MT or CLM majors only

MT 2000 Fundamentals of Meteorology and Climatology (3)

Fundamental description of atmospheric phenomena and climate. The global energy budget, winds, air masses, fronts, clouds, snow, rain and hail, thunderstorms, tornadoes, and tropical phenomena are discussed. Climate subjects covered include regional climatology and climate classification, the effect of climate on human cultures and societies, and theories of climate change including natural and anthropogenic processes. Falls. (GACO)

MT 2250 Introduction to Weather Analysis and Forecasting (4)

An introduction to the techniques used to understand and interpret synoptic-scale atmospheric processes and their application to weather analysis and forecasting. Topics include decoding, plotting, and analysis of standard meteorological data; plotting and interpretation of thermodynamic diagrams; survey of weather maps and charts; extratropical cyclone structure and cyclogenesis; introduction to principles of numerical weather prediction and basic short-term forecasting techniques. Springs.
Prerequisite(s): MT 2000 or MT 2110.

MT 3230 Atmospheric Thermodynamics (3)

Development of the kinetic theory of gases. Treatment of the First and Second Laws of Thermodynamics, with emphasis on atmospheric applications. Adiabatic processes, stability and the use of thermodynamics diagrams. Use of computer applications. Severe weather indices. Additional course fee required. Springs.
Prerequisite(s): MT 2250, and MA 2550 (may be taken concurrently).

MT 3725 Instruments and Observations in Meteorology (3)

Utilization of standard meteorological instruments. Practical problems in measuring and recording systems. Data reduction and analysis. Experimental meteorological literature. Introduction to one or more data analysis software packages. Lectures, labs, and writing assignments. Falls.
Prerequisite(s): MT 2000 and MA 2550 (may be taken concurrently)
Corequisite(s): N/A

MT 4000 Meteorology Seminar (1)

This course focuses on the development of professional and technical oral communication skills. Students will lead weekly presentations of real-time meteorological analyses and forecasts and interdisciplinary scientific results from literature reviews, case studies, or research. Repeatable for a maximum of 10 credits. Springs and Falls.
Prerequisite(s): MT 2250.

MT 4155 Air Quality (3)

Encompasses an extensive overview of the science of Air Quality. Topics include atmospheric chemistry, air quality meteorology and forecasting techniques, air pollution sources, sinks and effects (atmospheric, environmental), including an examination of historical and current policy issues relevant to each topic. Springs Odd.
Prerequisite(s): MT 2000 and CH 2335

MT 4264 Broadcast Meteorology (1)

Introduction to broadcast presentation skills and the utilization of meteorological graphics software. Examines professional broadcast meteorology certification requirements. Introduces geographical terminology for local, regional, synoptic, and global areas. Discusses evolution of broadcast meteorology and future trends. Students prepare sample weathercast segments and produce a station scientist video production on subjects satisfying guidelines provided by the American Meteorological Society. Falls.
Prerequisite(s): MT 2250.

MT 4280 Synoptic Meteorology (4)

Intermediate and advanced weather analysis and forecasting techniques are used to understand synoptic-scale weather systems. Topics include applications of numerical weather prediction and forecast uncertainty, kinematic wind analysis, jet streak circulations, quasi-geostrophic equations, isentropic analysis, cross-section diagrams, potential vorticity thinking, life cycle of extratropical cyclones including frontal evolutions, and extratropical and tropical transition. Springs Even. (TECO)
Prerequisite(s): MT 4310.

MT 4310 Dynamic Meteorology I (3)

Introduction to geophysical fluid dynamics including the development of the fundamental equations, governing atmospheric motion, basic approximations, simplified flows and physical interpretation of the corresponding theory. Falls Odd.
Prerequisite(s): PH 2410, and MA 2560 (may be taken concurrently).

MT 4320 Dynamic Meteorology II (3)

Advanced topics in geophysical fluid dynamics including circulation theory, vorticity, planetary boundary layer, quasi-geostrophic theory and introductory numerical modeling concepts. Springs Even.
Prerequisite(s): MT 4310, and MA 3540 (may be taken concurrently).

MT 4360 Forecasting/Broadcast Practicum (1)

Provides students an opportunity to improve forecasting, computer software and communication skills while formally meeting forecast deadlines on a daily basis. Forecasts are prepared and presented for broadcast on local media outlets. May be repeated for a maximum of 4 credits. Additional course fee required. Falls and Springs.
Prerequisite(s): MT 2250.

MT 4405 Numerical Weather Prediction (3)

Acquaints students with the concepts, procedures, theory, and problems associated with numerical weather prediction through discussion and by writing computer programs to process both real and simulated data. Covers the mathematical basis for various analysis and predictive techniques and their benefits and/or limitations. Students learn about the configuration and capabilities of current operational numerical analysis and prediction models. Falls Odd. (TECO)
Prerequisite(s): (CS 2400 or CS 2370) and (MA 3500 or MA 2300)

MT 4410 Atmospheric Physics (3)

An application of the basic laws of physics to atmospheric processes. Topics discussed include gravitational effects, properties of atmospheric gases, cloud physics, solar and terrestrial radiation, atmospheric electricity and optical and acoustic phenomena. Falls Even.
Prerequisite(s): MT 2000 or MT 2110, PH 2410, and MA 2560 (can be taken concurrently).

MT 4425 Tropical Weather and Climate (3)

An in-depth view of various topics related to tropical weather and climate, such as tropical climatology, easterly waves, tropical cyclones, monsoons, El Niño-Southern Oscillation (ENSO), and other types of tropical variability. Falls Even.
Prerequisite(s): MT 2250, MA 2550.

MT 4460 Climate Dynamics (3)

Introduction to the mean thermodynamic state of the atmosphere and connections to transient weather phenomena, including zonal and eddy flow interactions, energy and momentum flux, troposphere-stratosphere interactions, and subseasonal-to-interannual atmospheric interactions with the cryosphere, hydrosphere, and pedosphere. Falls Odd.

Prerequisite(s): MA 3500 or MA 2300 (may be taken concurrently) and MT 2000.

MT 4480 Mesoscale Meteorology (3)

Focuses on the detailed descriptive aspects of mesoscale phenomena and processes with an emphasis on the structure. Defines what is meant by the term "mesoscale" and to what kinds of systems it applies. Deals with internally generated mesoscale circulations. Examines various mesoscale convective systems. Discusses externally forces mesoscale systems. Using observational cases, covers terminology, characteristics, and behavior of mesoscale events. Springs Odd.

Prerequisite(s): MT 3230 and MA 2560.

MT 4500 Undergraduate Research (1-4)

Guided research in atmospheric sciences under the supervision of a faculty advisor. Repeatable for credit.

MT 4560 Topics in Meteorology (1-4)

Covers material related to a subdiscipline or topic in Meteorology that is not covered in the regular curriculum. May be repeated with a different topic so that students can receive exposure to a variety of subject areas.

MT 4600 Internship (1-4)

Involves 1-4 weeks of full-time work or equivalent part-time work at a private or governmental forecast office, weather observatory or broadcasting facility. The on-site experience is provided to give students an opportunity to become more familiar with meteorological equipment and forecasting procedures and to participate in daily weather observations, discussions, and presentations as appropriate. Compensation is not necessarily provided for intern time. One credit is given for each 40-hour week of participation. Students must submit a written report when the internship is completed. Repeatable for credit. Instructor permission required.

Prerequisite(s): MT 2000 or MT 2110.

MT 4725 Meteorological Remote Sensing (3)

Principles and practices of remote sensing techniques in meteorological operations and research. Basics of electromagnetic radiation and orbital mechanics. Descriptions of weather radar systems, meteorological satellites, atmospheric profilers, and related devices. Interpretation of data produced by radar and satellite systems. Falls Even. (WRCO)

Prerequisite(s): MT 3720 and MA 2550.

MT 4910 Independent Study (1-4)

Ordinarily for Meteorology majors. Studies undertaken are defined by students and their instructor. Work may involve reading, conferences, historical, experimental or theoretical projects, field investigations, statistical surveys or combinations of the foregoing.