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.

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.

MT 3230  Atmospheric Thermodynamics (3)  

MT 3300  Synoptic Meteorology I (4)  
An introduction to the techniques used to understand synoptic-scale atmospheric processes and their application to weather analysis and forecasting. Topics include decoding and plotting standard meteorological data; plotting and interpretation of thermodynamic diagrams and cross-section analyses; manual analyses of upper-air and surface data; survey of weather graphics products from both facsimile and Internet resources; kinematics of meteorological scalar and vector fields; introduction to basic forecasting techniques; a survey of operational forecast models. Additional course fee required. Falls. Prerequisite(s): MA 2550 (may be concurrent) and MT 2110.

MT 3720  Meteorological Instruments and Observations (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. (WRCO)

MT 4150  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. May be taken as CH 4150. (INCO) (INCP)

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.

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. (TECO)

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. Prerequisite(s): MA 2560, MT 3230, and PH 2420.

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.

MT 4330  Current Weather Seminar (1)  
Student-led presentation and class discussion of real-time weather data and forecasts in a professional and technical weather briefing format. May be repeated up to 4 credits. Additional course fee required.

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.

MT 4400  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. (INCO) (INCP) (TECO)

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.

MT 4420  Tropical Weather and Climate (3)  
An in-depth view of various topics related to tropical weather and climate, including tropical climatology, easterly waves, tropical cyclones, monsoons, El Niño, La Niña and the Southern Oscillation (ENSO), and other types of tropical variability. Falls Even. (INCO) (INCP) Prerequisite(s): MT 2250, MA 2550.
MT 4440 Climate Change (3)
Overview of the methods for examining climate change. Included are time series analysis and climate proxies such as tree-ring analysis, $\delta^{18}O/\delta^{16}O$ ratios, pollen and carbon-14 dating. Also covered are a variety of possible causal factors such as orbital variations, plate tectonics, volcanic eruptions, CO$_2$ variations and El Niño. The results of paleoclimatic modeling are also discussed. May be taken as ESP 4440. Springs. (INCO) (INCP)
Prerequisite(s): MT 2000 or GE 2001 or ESP 3320 or ESP 3330.

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.

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.

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.

MT 4720 Remote Sensing in Meteorology (3)

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.