



THE ACADEMY EDUCATES, TRAINS AND INSPIRES MEN
AND WOMEN TO BECOME OFFICERS OF CHARACTER.

METEOROLOGY MAJOR

Suggested Course Sequence

3rd-Class Year	2nd-Class Year	1st-Class Year
Biology 315	Academy Opt	AstroEngr310
Chem 200	Aero Engr 315	English 411
Econ 201	BehSci 310	Meteor 431
English 211	ECE 315	Meteor 440
EngrMech 220	History 300	Meteor 451
Law 220	Meteor Elec	Meteor 452
Math 356	Meteor 325	Meteor 470
Meteor 320	Meteor 330	Meteor 490
MSS 200	Meteor 331	Meteor Elective
Physics 215	Meteor 352	Mgt 400
Pol Sci 211	Meteor 430	MSS 415/416
	Philos 310	SocSci 412

METEOROLOGY (Meteor)

Offered by the Departments of Economics and Geosciences (DFEG) and Physics (DFP).

Meteor 320. Introduction to Meteorology and Aviation Weather. Surveys the fundamentals of meteorology. Emphasizes flight weather and its impact on aviation. Topics include atmospheric thermodynamics, cloud physics, air masses and weather systems, weather forecasting, severe weather, hazards to aviation, introduction to weather satellites and radar and an introduction to the near-earth space environment.

Meteor 325. Weather Data, Analysis and Quantitative Methods. Introduction to the data sources, objective and subjective data analysis techniques, and quantitative methods used in meteorology. Topics include conventional surface and upper air data, fundamentals of radar and satellite observations, weather map analysis, and quantitative methods covering partial derivatives, vector analysis, kinematic properties of fluid flow, Lagrangian and Eulerian frames of reference, and numerical integration and differentiation. Emphasizes practical application of the above quantitative techniques to weather charts and vertical atmospheric soundings.

Meteor 330. Physical Meteorology I. Classical thermodynamics applied to both the dry and moist atmosphere. Topics include atmospheric composition and structure, thermodynamic systems and variables, the gas laws, atmospheric pressure, the first and second laws of thermodynamics, moist processes in the atmosphere, latent and sensible heat in the atmosphere, atmospheric stability and thermodynamic diagrams.

Meteor 331. Physical Meteorology II. Atmospheric radiation and optics, cloud and precipitation physics, and atmospheric electricity. Topics include the spectrum of radiation, blackbody radiation, transmission, absorption and emission of radiation in the atmosphere, scattering of radiation in the atmosphere, radiation fluxes and heating rates in the atmosphere, atmospheric aerosols, nucleation of water vapor condensation, warm cloud processes, cold cloud processes, thunderstorms, and atmospheric electricity.

Meteor 352. Climatology. Introduction to climatology, including fundamental, long-term processes involving energy, moisture and momentum transfer in the earth's climate system. Topics include understanding current world climate patterns and climate change and applying climatology to enhance human activities.

Meteor 430. Atmospheric Dynamics I. Advanced course in atmospheric dynamics. Topics include continuity, thermodynamic energy, the equations of motion, hydrostatic balance, generalized vertical coordinate systems, balanced and unbalanced flows, circulation, vorticity and potential vorticity and quasi-geostrophic theory.

Meteor 431. Atmospheric Dynamics II. Advanced applications of atmospheric dynamics. Topics include advanced quasi-geostrophic applications, baroclinic instability, cyclogenesis, fronts and frontogenesis, atmospheric wave theory and behavior, boundary layer physics and numerical weather prediction.

Meteor 440. Weather Analysis and Forecasting. A laboratory course emphasizing the use of meteorological observations, analyses and numerical model output to characterize the structure and evolution of tropical cyclones and extratropical weather systems. Gives particular attention to translating this understanding of weather systems into forecasts of important weather parameters at given locations over a period of a few days.

Meteor 451. Synoptic Meteorology. Study of the development and evolution of large-scale weather systems, including surface and upper level pressure, temperature and wind patterns, air masses, fronts, extratropical cyclones and jet streams.

Meteor 452. Mesoscale Meteorology. Study of the structure, development and evolution of mesoscale weather systems. Topics include fronts and jet streaks, instabilities, gravity waves, convective storms, squall lines, tornadoes and mesoscale convective complexes. Introduces analysis techniques and nowcasting. Extensive use of real-time satellite and Doppler radar data and numerical forecast products in the meteorological laboratory.

Meteor 470. Meteorological Applications of Remote Sensing. An in-depth examination of how meteorologists exploit surface and satellite platforms to remotely measure the physical characteristics of a broad range of meteorological phenomena. Topics include the physical basis of the remote sensing products and their application to meteorology with a focus on currently employed systems. Students will utilize imagery analysis techniques to determine the state of the atmosphere from these resources. Administered jointly by the Department of Physics and the Department of Economics and Geosciences.

Meteor 490. Meteorological Interpretation, Analysis and Integration. Capstone course in meteorology. Using real-world scenarios, course assesses the student's ability to integrate and synthesize a wide range of meteorological information to include observational data, analyses and operational forecasts. Gives particular attention to weather support for military operations.

Meteor 499. Independent Study. Individual research under the direction of a faculty member.