

METEOROLOGY (METR)

METR 121 Meteorology 3 Hours (repeatable max of 3 hrs)

An introduction to the elements of the atmosphere, severe storms, atmospheric environmental issues, the interdependence between human life and the atmosphere, and rudimentary forecasting of basic weather systems. A self-paced laboratory is required. (2 hour lecture; 1 hour lab)

Colonnade/Statewide General Education Code E-NS, E-SL | NS, SL

Recent Term(s) Offered: winter 2022; spring 2022; fall 2022; winter 2023; spring 2023; summer 2023; fall 2023; winter 2024; spring 2024; summer 2024; fall 2024

METR 122 Aviation Meteorology 3 Hours

The emphasis of the course will be on weather elements and their measurements, weather instruments, weather codes needed by aviators, weather effects upon flying, and weather hazards of aviation.

Recent Term(s) Offered: spring 2022; spring 2023; spring 2024

METR 322 Global Climate Systems 3 Hours

Analyzes the elements of climate and their world distribution with emphasis on the climatic controls and processes; surveys the influences of climates on environment; introduces climatic classification systems and climatological regions of the world.

Prerequisite(s): METR 121

Recent Term(s) Offered: fall 2023

METR 324 Weather Analysis and Forecasting 3 Hours

Analysis of the atmosphere using satellite and radar imagery. Weather forecasting techniques using surface and upper air data are also examined. Note: Permission of instructor may be required.

Prerequisite(s): METR 121

Recent Term(s) Offered: spring 2022; spring 2023; spring 2024

METR 325 Meteorological Instrumentation and Measurement 3 Hours

Introduces the purpose, operation, and application of meteorological instrumentation and the treatment of meteorological measurements.

Prerequisite(s): METR 121

Recent Term(s) Offered: fall 2022; fall 2024

METR 326 Applied Meteorology / Climatology 3 Hours

This course offers a practical insight into the influence of meteorology and climatology on everyday life. Environmental problems caused by changes in the atmosphere are also examined. Note: Permission of instructor may be required.

Prerequisite(s): METR 121

Recent Term(s) Offered: fall 2023; fall 2024

METR 335 Satellite/Radar Meteorology 3 Hours

An introduction to remote sensing specific to the atmospheric sciences. Specific attention is given to analysis, diagnostic, and prognostic determinations using various satellites, as well as surface and space-based active radar systems. Specific applications focus on synoptic and mesoscale phenomena, including large-scale kinematics and morphology, clouds, derived radar interpretation, precipitating systems, and precipitation measurement.

Prerequisite(s): METR 324

Recent Term(s) Offered: fall 2023

METR 422 Physical Climatology 3 Hours

Addresses the complexity of climatic processes at various spatial and temporal scales. Budgets of energy, water, and momentum, and soil-plant-atmosphere interactions at the earth's surface are explored from both a theoretical and practical point of view.

Prerequisite(s): METR 324 with a minimum grade of C and MATH 237 with a minimum grade of C

Recent Term(s) Offered: spring 2023

METR 425 Field Methods in Severe Weather Analysis and Forecasting 4 Hours (repeatable max of 8 hrs)

Provides an intensive, comprehensive field-based weather analysis and forecasting experience that focuses on all forms of severe weather, including tornadoes. Students will travel across the Great Plains collecting and analyzing weather data, predicting severe convective thunderstorms, and formulating logistical plans to document forecast outcomes each day. Students will also have the opportunity for applied learning approaches in leadership, collaborative team-building, and professional aptitude development.

Prerequisite(s): METR 324

Recent Term(s) Offered: summer 2023; summer 2024

METR 430 Meteorological Computing 3 Hours

Introduction to Python-based skills for meteorological data manipulation, processing, and visualization. Mainstream meteorological data sources and formats (e.g., ASCII, CSV, GRIB, NetCDF) will be involved in weather analysis and map generation.

Prerequisite(s): METR 324 and CS 170

Recent Term(s) Offered: fall 2022; fall 2024

METR 431 Dynamic Meteorology I 3 Hours

Introduction to large-scale dynamics of the Earth's troposphere focusing on fundamental topics, the basic governing equations of motion in the atmosphere, and dry thermodynamics.

Prerequisite(s): METR 324 with a minimum grade of C and MATH 237 with a minimum grade of C

Recent Term(s) Offered: fall 2023

METR 432 Synoptic Meteorology 3 Hours

Addresses the analysis and prediction of large-scale weather systems, such as extra-tropical cyclones, fronts and jet streams through the application of fundamental dynamical concepts of meteorology.

Prerequisite(s): METR 324 with a minimum grade of C and MATH 237 with a minimum grade of C

Recent Term(s) Offered: fall 2022; fall 2024

METR 433 Dynamic Meteorology II 3 Hours

Analysis of phenomena related to large scale dynamics of the Earth's troposphere including thermodynamics, elementary applications of the basic equations, and circulation and vorticity.

Prerequisite(s): METR 431 with a minimum grade of C

Recent Term(s) Offered: spring 2022; spring 2024

METR 437 Mesoscale Meteorology 3 Hours

Addresses the analysis and prediction of convective and mesoscale phenomena, such as mesoscale convective systems, severe thunderstorms, tornadoes and hurricanes.

Prerequisite(s): METR 432 with a minimum grade of C

Recent Term(s) Offered: spring 2023

METR 438 Physical Meteorology 3 Hours

Addresses the microscopic processes related to cloud formation, radiative transfer, precipitation processes and dry and moist thermodynamics.

Prerequisite(s): METR 431 with a minimum grade of C

Recent Term(s) Offered: spring 2022; spring 2024

METR 439 Atmospheric Modeling 3 Hours

An introduction to numerical weather and climate modeling techniques and models, with focus on modeling fundamentals, including dynamics, physical parameterizations, grids and resolutions, model structures and components. Includes hands-on experience with designing numerical experiments, configuring and running model simulations, post-processing model outputs, and visualization.

Prerequisite(s): METR 324 with a minimum grade of C and CS 170 with a minimum grade of C

Recent Term(s) Offered: None

METR 460 Climate Teleconnections 3 Hours

Analysis of the climate impacts and physical mechanisms of atmospheric and oceanic teleconnections that commonly affect weather patterns in the northern hemisphere. Note: Permission of instructor may be required.

Prerequisite(s): (METR 322 or METR 324)

Recent Term(s) Offered: spring 2023

METR 475 Selected Topics in Meteorology 1-3 Hours (repeatable max of 12 hrs)

A study of a selected problem under the supervision of a faculty member.

Recent Term(s) Offered: spring 2022; summer 2022; fall 2022; spring 2023; summer 2023; fall 2023; spring 2024; summer 2024; fall 2024