ATM SCI 100 Survey of Meteorology
3 cr. Undergraduate.
Concepts and principles of meteorology; cyclones, fronts, thunderstorms, tornadoes, air pollution, and climate. Interpretation of weather maps, charts, and forecasts. 2 hrs lec, 2 hrs lab-dis.
Prerequisites: none.
Course Rules: Counts as repeat of 3 cr Atm Sci 100 taken for 4 cr.
General Education Requirements: NS
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 106 Principles and Forecasting of the Weather
3 cr. Undergraduate.
What makes the weather, general circulation of the atmosphere, analysis of meteorological data and their use in predicting the weather.
Prerequisites: none.
General Education Requirements: NS
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 108 Rain and Snow
3 cr. Undergraduate.
Study of precipitation properties and processes in the atmosphere. Structure of precipitating systems ranging from small to large scale.
Prerequisites: none.
General Education Requirements: NS
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 109 Thunderstorms, Tornadoes and Hurricanes
3 cr. Undergraduate.
The study of basic processes that lead to dry and moist convection. Characteristic atmospheric structure and cloud microphysical processes that produce thunderstorms, tornadoes and hurricanes.
Prerequisites: none.
General Education Requirements: NS
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 194 First-Year Seminar:
3 cr. Undergraduate.
Specific topics are announced in the Schedule of Classes each time the class is offered.
Prerequisites: none.
Course Rules: Open only to freshmen. Students may earn cr in just one L&S First-Year Sem (course numbers 192, 193, 194).
General Education Requirements: NS
Last Taught: Spring 2019, Fall 2016, Fall 2014, Fall 2012.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 199 Independent Study
1-3 cr. Undergraduate.
For further information, consult dept chair.
Prerequisites: 2.0 GPA; consent of instructor, department chair, and Assistant Dean for Student Academic Services.
Course Rules: May be retaken to 6 cr max.
Last Taught: Fall 2013, Spring 2013, Spring 2006, Fall 2005.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 240 Introduction to Meteorology
3 cr. Undergraduate.
Quantitative approach to understanding fundamental concepts in meteorology. Radiation, heat balance of the atmosphere, thermodynamics, horizontal motion, general circulation, atmospheric observations, clouds, weather map analysis.
Prerequisites: Physics 209(P) & 214(P); Math 232(C).
Course Rules: Not open for cr to students with Atm Sci 201.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 289 Internship in Atmospheric Sciences, Lower Division
1-6 cr. Undergraduate.
Application of basic knowledge of Atmospheric Sciences in business, organizational, educational, political or other appropriate setting.
Prerequisites: soph st.; 2.50 gpa; cons supervising faculty member.
Course Rules: One cr earned for academic work based on 40 hrs in internship. May be retaken to 6 cr max.
Last Taught: Spring 2015, Fall 2013, Fall 2012, Fall 2011.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 297 Study Abroad:
1-12 cr. Undergraduate.
Designed to enroll students in UWM sponsored program before course work level, content, and credits are determined and/or in specially prepared course work.
Prerequisites: acceptance for Study Abroad Prog.
Course Rules: May be retaken w/chg in topic.
General Education Requirements: NS
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 299 Ad Hoc:
1-6 cr. Undergraduate.
Course created expressly for offering in a specified enrollment period. Requires only dept & assoc dean approval. In exceptional circumstances, can be offered in one add'l sem.
Prerequisites: none; add'l prereqs may be assigned to specific topic.
Course Rules: May be retaken w/chg in topic.
Last Taught: Spring 2019, Fall 2013, Fall 1994, Fall 1992.
Current Offerings: https://catalog.uwm.edu/course-search/
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites</th>
<th>Last Taught</th>
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</thead>
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<tr>
<td>ATM SCI 350 Atmospheric Thermodynamics</td>
<td>3 cr. Undergraduate/Graduate. Radiant energy, sensible heat, and atmospheric thermodynamics; the gas laws; hydrostatic and psychrometric equations; dry and moist convection; clouds and their physical and energy relations. Optional field exercise.</td>
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<td>ATM SCI 351 Dynamic Meteorology I</td>
<td>3 cr. Undergraduate/Graduate. The role of dynamics in atmospheric physics; equations of motion; symmetric circulation models; gravity waves; Rossby waves; quasi-geostrophy; introduction to instability of atmospheric flows.</td>
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<tr>
<td>ATM SCI 351G Dynamic Meteorology I</td>
<td>3 cr. Undergraduate/Graduate. The role of dynamics in atmospheric physics; equations of motion; symmetric circulation models; gravity waves; Rossby waves; quasi-geostrophy; introduction to instability of atmospheric flows.</td>
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<td>ATM SCI 352 Dynamic Meteorology II</td>
<td>3 cr. Undergraduate/Graduate. Circulation, vorticity, potential vorticity; shallow water equations: Poincare, Kelvin, and Rossby waves, energy and enstrophy; quasi-geostrophy for a stratified atmosphere; barotropic and baroclinic instability.</td>
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<td>ATM SCI 360 Synoptic Meteorology I</td>
<td>4 cr. Undergraduate/Graduate. Fundamental principles; synoptic-scale structure and dynamics; equivalent barotropic model; vertical motions; introduction to and application of quasi-geostrophic theory.</td>
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<tr>
<td>ATM SCI 360G Synoptic Meteorology I</td>
<td>4 cr. Undergraduate/Graduate. Fundamental principles; synoptic-scale structure and dynamics; equivalent barotropic model; vertical motions; introduction to and application of quasi-geostrophic theory.</td>
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<tr>
<td>ATM SCI 361 Synoptic Meteorology II</td>
<td>4 cr. Undergraduate/Graduate. Extension of quasi-geostrophic theory to Q-vectors; isentropic potential vorticity applied to mid-latitude weather systems; fronts and jets.</td>
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<tr>
<td>ATM SCI 361G Synoptic Meteorology II</td>
<td>4 cr. Undergraduate/Graduate. Extension of quasi-geostrophic theory to Q-vectors; isentropic potential vorticity applied to mid-latitude weather systems; fronts and jets.</td>
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<td>ATM SCI 381 Honors Seminar</td>
<td>3 cr. Undergraduate. Selected topics.</td>
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ATM SCI 405 Atmospheric Science for in-Service Teachers:
1-3 cr. Undergraduate/Graduate.
Basic, advanced or new topics in atmospheric sciences for in-service teachers.
Prerequisites: In-service teacher; add'l prereqs depending on topic.
Course Rules: May be retaken w/chg in topic to 9 cr max.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 405G Atmospheric Science for in-Service Teachers:
1-3 cr. Undergraduate/Graduate.
Basic, advanced or new topics in atmospheric sciences for in-service teachers.
Prerequisites: In-service teacher; add'l prereqs depending on topic.
Course Rules: May be retaken w/chg in topic to 9 cr max.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 460G Mesoscale Circulations
3 cr. Undergraduate/Graduate.
Theory, analysis and forecasting of mesoscale flows, including convective systems, polar lows, terrain and surface-forced flows, jet streams and hurricanes.
Prerequisites: Jr st; Atm Sci 360(R) or cons instr.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 464G Physical Meteorology: Cloud Physics
3 cr. Undergraduate/Graduate.
Formation of cloud droplets, droplet growth by condensation, formation of ice crystals, precipitation processes, weather radars, cloud models.
Prerequisites: Jr st; Physics 210(P); Math 232(P); Atm Sci 350(P).
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 464G Physical Meteorology: Cloud Physics
3 cr. Undergraduate/Graduate.
Formation of cloud droplets, droplet growth by condensation, formation of ice crystals, precipitation processes, weather radars, cloud models.
Prerequisites: Jr st; Physics 210(P); Math 232(P); Atm Sci 350(P).
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 470 Tropical Meteorology
3 cr. Undergraduate/Graduate.
Prerequisites: Atm Sci 351(P) or 360(P).
Last Taught: Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 470G Tropical Meteorology
3 cr. Undergraduate/Graduate.
Prerequisites: Atm Sci 351(P) or 360(P).
Last Taught: Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 480 The General Circulation and Climate Dynamics
3 cr. Undergraduate/Graduate.
Historical overview, the zonally symmetric circulation, momentum, heat and water budgets, stationary waves, the El Nino Southern oscillation, global warming, interpentadal variability in the North Atlantic.
Prerequisites: Jr st; Atm Sci 351(P).
Last Taught: Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 480G The General Circulation and Climate Dynamics
3 cr. Undergraduate/Graduate.
Historical overview, the zonally symmetric circulation, momentum, heat and water budgets, stationary waves, the El Nino Southern oscillation, global warming, interpentadal variability in the North Atlantic.
Prerequisites: Jr st; Atm Sci 351(P).
Last Taught: Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 497 Study Abroad:
1-12 cr. Undergraduate/Graduate.
Designed to enroll students in UWM sponsored program before course work level, content, and credits are determined and/or in specially prepared course work.
Prerequisites: Jr st; acceptance for Study Abroad Prog.
Course Rules: May be retaken w/chg in topic.
General Education Requirements: NS
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 497G Study Abroad:
1-12 cr. Undergraduate/Graduate.
Designed to enroll students in UWM sponsored program before course work level, content, and credits are determined and/or in specially prepared course work.
Prerequisites: Jr st; acceptance for Study Abroad Prog.
Course Rules: May be retaken w/chg in topic.
General Education Requirements: NS
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 499 Ad Hoc:
1-6 cr. Undergraduate.
Course created expressly for offering in a specified enrollment period. Requires only dept & assoc dean approval. In exceptional circumstances, can be offered in one add'l sem.
Prerequisites: Jr st; add'l prereqs may be assigned to specific topic.
Course Rules: May be retaken w/chg in topic.
Current Offerings: https://catalog.uwm.edu/course-search/
ATM SCI 500 Statistical Methods in Atmospheric Sciences
3 cr. Undergraduate/Graduate.
Mathematical and statistical tools applicable to the investigation of atmospheric problems; the nature and treatment of atmospheric data.
Prerequisites: jr st; Atm Sci 240(P) or 350(P), & Math 232(P) or cons instr.
Last Taught: Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 500G Statistical Methods in Atmospheric Sciences
3 cr. Undergraduate/Graduate.
Mathematical and statistical tools applicable to the investigation of atmospheric problems; the nature and treatment of atmospheric data.
Prerequisites: jr st; Atm Sci 240(P) or 350(P), & Math 232(P) or cons instr.
Last Taught: Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 505 Micrometeorology
3 cr. Undergraduate/Graduate.
Surface energy budget; radiation balance and heat transfer; boundary-layer profiles of wind, temperature and moisture; turbulence and boundary-layer fluxes; evapotranspiration; special topics.
Prerequisites: jr st; Atm Sci 351(P) & 330(P).
Last Taught: Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 505G Micrometeorology
3 cr. Undergraduate/Graduate.
Surface energy budget; radiation balance and heat transfer; boundary-layer profiles of wind, temperature and moisture; turbulence and boundary-layer fluxes; evapotranspiration; special topics.
Prerequisites: jr st; Atm Sci 351(P) & 330(P).
Last Taught: Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 511 Seminar in Atmospheric Radiation and Remote Sensing
3 cr. Undergraduate/Graduate.
Basic laws of radiation, absorption and scattering, weather radar, retrieval of soundings, remote sensing and climate, weather satellites.
Prerequisites: jr st; Math 232(P); Atm Sci 350(P) & Physics 210(P).
Last Taught: Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 511G Seminar in Atmospheric Radiation and Remote Sensing
3 cr. Undergraduate/Graduate.
Basic laws of radiation, absorption and scattering, weather radar, retrieval of soundings, remote sensing and climate, weather satellites.
Prerequisites: jr st; Math 232(P); Atm Sci 350(P) & Physics 210(P).
Last Taught: Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 520 Advanced Dynamic Meteorology
3 cr. Undergraduate/Graduate.
Properties of atmospheric sound, gravity, Rossby waves. Baroclinic instability, cyclogenesis, frontogenesis, and the general circulation. Introduction to numerical prediction.
Prerequisites: jr st; Math 234(P), Atm Sci 350(P) & 351(P) or equiv.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 520G Advanced Dynamic Meteorology
3 cr. Undergraduate/Graduate.
Properties of atmospheric sound, gravity, Rossby waves. Baroclinic instability, cyclogenesis, frontogenesis, and the general circulation. Introduction to numerical prediction.
Prerequisites: jr st; Math 234(P), Atm Sci 350(P) & 351(P) or equiv.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 599 Capstone Experience
1 cr. Undergraduate.
Student writes a paper under supervision of an advisor on an approved topic not covered in the student’s regular course work.
Prerequisites: sr st; cons instr.
Course Rules: May be retaken w/chg in topic to 2 cr max.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 600 Data Analytics
3 cr. Undergraduate/Graduate.
Over techniques used to analyze data and test scientific hypotheses for both diagnostic/understanding and prognostic/prediction applications, particularly in the atmospheric and related sciences.
Prerequisites: junior standing, or graduate standing, or consent of instructor.
Course Rules: Counts as repeat of ATM SCI 690 with same topic.
Last Taught: Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 600G Data Analytics
3 cr. Undergraduate/Graduate.
Over techniques used to analyze data and test scientific hypotheses for both diagnostic/understanding and prognostic/prediction applications, particularly in the atmospheric and related sciences.
Prerequisites: junior standing, or graduate standing, or consent of instructor.
Course Rules: Counts as repeat of ATM SCI 690 with same topic.
Last Taught: Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 690 Seminar in Atmospheric Sciences:
1-3 cr. Undergraduate.
Intensive topical studies of currently active problem areas.
Prerequisites: jr st; cons instr.
Course Rules: May be retaken w/chg in topic to 9 cr max. Satisfies L&S Seminar req.
Last Taught: Fall 2018, Fall 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 690G Seminar in Atmospheric Sciences:
1-3 cr. Undergraduate.
Intensive topical studies of currently active problem areas.
Prerequisites: jr st; cons instr.
Course Rules: May be retaken w/chg in topic to 9 cr max. Satisfies L&S Seminar req.
Last Taught: Fall 2018, Fall 2016.
Current Offerings: https://catalog.uwm.edu/course-search/
ATM SCI 695 Internship in Atmospheric Sciences, Upper Division
1-6 cr. Undergraduate.
Application of advanced principles of atmospheric sciences in a business, organizational, educational, political or other appropriate setting.
Prerequisites: jr st, 300-level or above course in atm sci; 3.0 gpa in the major; cons supervising faculty.
Course Rules: One cr earned for 40 hrs work. May be retaken to 6 cr max.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 699 Advanced Independent Reading
1-3 cr. Undergraduate.
Independent meteorological study.
Prerequisites: jr st, 2.0 GPA, consent of instructor, Department Chair, and Assistant Dean for Student Academic Services.
Course Rules: May be retaken with change in topic to 3 cr max.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 700 Statistical Methods in Atmospheric Sciences II: Signal Detection
3 cr. Graduate.
Fundamentals of signal detection in noisy multivariate space-time data sets; empirical orthogonal functions, singular value decomposition, maximum covariance analysis and canonical correlation analysis; Fourier analysis; singular and multivariate spectrum analysis.
Prerequisites: graduate standing in physical sciences or engineering.
Course Rules: Counts as a repeat of ATM SCI 950 with the same topic.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 705 Air Pollution Modeling
3 cr. Graduate.
Prerequisites: grad st; cons instr.
Last Taught: Fall 2020, Fall 2018, Fall 2016, Fall 2014.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 711 Cloud Dynamics
3 cr. Graduate.
Prerequisites: grad st; cons instr.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 725 Remote Sensing of the Environment
3 cr. Graduate.
Remote sensing technology, data processing, and analysis in meteorology, with application to oceanography and geology. Radar and acoustic sounding. Ers, sms/goes, thermal scanner, conventional weather satellites.
Prerequisites: grad st in Physics, Math, Geog, Geo Sci, Engr, or Atm Sci.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 730 Numerical Weather Prediction
3 cr. Graduate.
Numerical methods for predicting atmospheric phenomena; numerical stability and dispersion; implicit and explicit damping methods; physical process parameterization; ensemble data assimilation techniques.
Prerequisites: graduate standing in physical sciences or engineering.
Course Rules: Counts as a repeat of ATM SCI 950 with the same topic.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 750 Nonlinear Time Series Analysis
3 cr. Graduate.
Phase space reconstruction; singular spectrum analysis; prediction; dimension estimation; application of nonlinear time series analysis techniques to selected data sets.
Prerequisites: grad st; cons instr.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 760 Advanced Cloud, Aerosol & Precipitation Principles, Processes & Interactions
4 cr. Graduate.
(3 hr lc, 2 hr la). Theoretical & experimental look at cloud & precipitation formation, interaction & dissipation microphysics & chemistry aerosol physics & chemistry, & their application.
Prerequisites: grad st; Atm Sci 464(C) or cons instr.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 761 Advanced Synoptic/Mesoscale Meteorology
3 cr. Graduate.
Advanced analysis techniques for synoptic/mesoscale diagnoses, case studies of relevant circulation systems; role of planetary, synoptic, and mesoscale flows in system development.
Prerequisites: grad st; cons instr.
Last Taught: Fall 2019, Fall 2017, Fall 2015, Fall 2013.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 888 Candidate for Degree
0 cr. Graduate.
Available for graduate students who must meet minimum credit load requirement.
Prerequisites: graduate standing.
Course Rules: Fee for 1 cr assessed; unit does not count towards credit load for Fin Aid. Repeatable. Satisfactory/Unsatisfactory only.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 943 Seminar: Hydrology
3 cr. Graduate.
Prerequisites: grad st.
Course Rules: Retakable w/chg in topic to 9 cr max.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 950 Seminar on Topics in Atmospheric Sciences
3 cr. Graduate.
Selected topics in atmospheric dynamics, satellite meteorology, atmospheric & oceanic convection, air & water pollution, numerical prediction remote sensing, & others.
Prerequisites: grad st in physical sciences or engineering. Retakable w/chg in topic to 9 cr max.
Current Offerings: https://catalog.uwm.edu/course-search/
ATM SCI 990 Master's Thesis
1-8 cr. Graduate.
Prerequisites: grad st; cons instr & completed thesis proposal.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 997 Doctoral Externship
1-12 cr. Graduate.
Externship for students enrolled in the Atmospheric Science PhD program.
Prerequisites: grad st; admis to candidacy for the PhD.
Course Rules: Retakeable to 12 cr max.
Last Taught: Fall 2019, Spring 2019, Fall 2018, Fall 2010.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 998 Doctoral Dissertation
1-12 cr. Graduate.
Prerequisites: grad st; admis to candidacy for PhD.
Current Offerings: https://catalog.uwm.edu/course-search/

ATM SCI 999 Advanced Independent Reading
1-12 cr. Graduate.
Independent meteorological study.
Prerequisites: grad st & cons instr.
Course Rules: Retakable to 12 cr max.
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/