

MSU Denver Professional Meteorology Major, B.S.

2024-2025 & 2025-2026 catalogs

Some courses are offered every 2, 3, or 4 semesters. Semesters offered listed above are tentative. The only course regularly offered online is MTR 1400, this major cannot be completed online.

General Studies Requirements: 33 credits, but 9 of these credits can double dip with required major courses

- ___ Written Communication (6 credits)
- ___ Quantitative Literacy (satisfied by Math requirement below or College Algebra, Trigonometry, Pre-Calculus, Calculus, or higher) (3 credits)
- ___ Oral Communication (3 credits)
- ___ Arts and Humanities (6 credits)
- ___ Historical (3 credits)
- ___ Natural and Physical Sciences (satisfied by major courses such as MTR 1400 and physics) (6 credits)
- ___ Social and Behavioral Sciences (6 credits)
- ___ Global Diversity Course (0-3 credits. This can double dip with another general studies category)

Ethnic Studies & Social Justice: 0-3 credits

- ___ Ethnic Studies & Social Justice Course (this can double dip with a General Studies category, formerly Multicultural)

Meteorology Core: 29 credits

Course	Prerequisite	Semester	Credits
___ MTR 1400 Weather and Climate	(none)	F, S, Su	3
___ MTR 2020 Weather and Climate Lab	Pre/Coreq MTR 1400, Algebra or up	F, S	1(lab)
___ MTR 2410 Weather Observing Systems	MTR 2020	S25,F26	3(lab)
___ MTR 3000 Weather Discussion (repeatable)	MTR 1400 or AES 1400	Often	1
___ MTR 3040 Computer Programming for MTRs	MTR 1400, MTR 2020	F24,F25,S27	3(lab)
___ MTR 3330 Climatology	MTR 1400 + quant lit	F23,S25,F26	3(lab)
___ MTR 3400 Synoptic Meteorology	MTR 2020	F	3
___ MTR 3410 Weather Analysis Techniques	MTR 3400	S	3(lab)
___ MTR 3420 Radar and Satellite Meteorology	MTR 2020 and MTH 1110	F26	3(lab)
___ MTR 3430 Atmospheric Thermodynamics	MTR 2020, MTH 1410, PHY2010/2311	F25,S27	3
___ MTR 4600 Meteorology Research Seminar	Senior Standing + 12 UD credits	S26,F27	3

Professional Concentration Additional Courses: 43 credits

Course	Prerequisite	Semester	Credits
___ MTR 3440 Physical Meteorology	MTR 2020,MTH 2410,PHY 2311/21	F24,S26	3
___ MTR 3450 Dynamic Meteorology	MTR 2020,MTH 2410,PHY 2311	F23,S25,F26	3
___ MTR 4400 Adv. Synoptic Meteorology	MTR 2410, MTR 3410, MTR 3450	S24,F25,S27	4(lab)
___ MTR 4500 Mesometeorology	MTR 3410 and MTH 1410	S25,S27	3
___ PHY 2311 General Physics I	MTH 1410	F, S, Su	4
___ PHY 2321 General Physics I Lab	concurrent with PHY 2311	F, S, Su	1
___ PHY 2341 General Physics II Lab	Trig or higher	F, S, Su	1
___ CHE 1800 General Chemistry I	Pre/Coreq MTH 1110	F, S, Su	4
___ MTH 1410 Calculus I	MTH 1110, and MTH 1120 or 1400	F, S, Su	4
___ MTH 2410 Calculus II	MTH 1410	F, S, Su	4
___ MTH 2420 Calculus III	MTH 2410	F, S, Su	4
___ MTH 3210 Probability and Statistics	MTH 1410	F, S, Su	4
___ MTH 3420 Differential Equations	MTH 2420	F, S, Su	4

Note, these major requirements in math get students close to completion of a math minor. Should students choose to declare and complete an optional math minor, choosing one the following meteorology-relevant courses will complete the requirements: CS 1050 Computer Science I, MTH 2520 R Programming, MTH 2540 Scientific Computing with Python, MTH 3220 Statistical Methods, MTH 3270 Data Science, MTH 3130 Applied Methods in Linear Algebra

Professional Meteorology Electives: 3 credits

Course	Prerequisite	Semester	Credits
___ MTR 2050 Community Climate Initiatives	Complete Quantitative Literacy	Occasionally	2
___ MTR 3100 Air Pollution	MTR 2020 or ENV 1200	Occasionally	3
___ MTR 3340 Climate Change Science	MTR 1400 (or other intros)	F24,S26	3
___ MTR 3500 Hazardous Weather	MTR 1400 or AES 1400	S26	3
___ MTR 3710 Meteorology Internship	See MTR Advisor	F, S, Su	1 to 6
___ MTR 3777 Field Observations of Severe Weather	MTR 2410, MTR 3410	some Mays	3(field)
___ MTR 3920 Directed Study in Meteorology	Instructor Permission	F, S, Su	1 to 5
___ MTR 4210 Forecasting Laboratory (repeatable)	MTR 3410	Occasionally	1
___ GIS 2250 Geographic Information Systems	Complete Quantitative Literacy	F, S	4
___ CS 1050 Computer Science I (with Java)	readiness for MTH 1110	F, S, Su	4
___ MTH 2520 R Programming	MTH 1110	S	4
___ MTH 2540 Scientific Computing with Python	MTH 1110		4
___ MTH 3220 Statistical Methods	MTH 3210		4
___ MTH 3270 Data Science	MTH 2520 and MTH 3210		4
___ MTH 3130 Applied Methods in Linear Algebra	MTH 1410		4

Unrestricted Electives – MTR students need 120 total credits to graduate. The number of General Elective credits you will need depend on how many credits you have. Many students take MTH 1110 College Algebra and MTH 1120 College Trigonometry, which will count towards 7 of your Unrestricted Elective credits. If students take the recommended courses for general studies, they can “double dip” classes in the major and general studies, but the credits only count once. **Quantitative literacy (3), Natural and Physical Science (6) will be fulfilled with classes in the major.** Meteorologists are both scientists and science communicators. Additional courses in communication, journalism, and emergency management are recommended. Students interested in graduate school should also complete General Physics II.

Unrestricted electives for students to get to 120 credits: **9-21**

Upper division credits: Students need 39 total upper division credits from any prefix to graduate.

Total credits for Meteorology Major: 120

Meteorology Description

Meteorology is an applied science that combines the fields of physics, chemistry, mathematics, and computer science into an application of understanding the atmosphere. The program exposes students to all these disciplines, while in parallel applying these hard science concepts to mesoscale, synoptic, and global scale phenomena. Students will be prepared for careers in a wide range of atmospheric science vocations, as well as further studies in graduate school. Students will be prepared to communicate forecasts verbally and in written form using their own imagery, explain the reasoning for the forecast as well as the uncertainty and the reasons for uncertainty involved to a wide range of audiences. Students may pick from two concentrations. **The Professional Meteorology concentration prepares students for careers with the National Weather Service or other government jobs by fulfilling their requirements.** The Applied Meteorology concentration prepares students for a variety of other less math-intensive careers in meteorology, including some private industry, or broadcasting. An advisor can help students choose the best concentration to fit their goals. A minor is not required, although students may opt to declare and complete a math minor by taking one additional math minor approved course.

Webpage

<https://www.msudenver.edu/earth-atmospheric-sciences/meteorology/>