

NORTHERN VERMONT UNIVERSITY ATMOSPHERIC SCIENCES DEGREE PLANNING GUIDE

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Atmospheric Sciences B.S.

Suggested pathways for **mathematics**, **science**, and **core atmospheric science** courses (and credits) required for the ATM B.S. degree program:

4-YEAR PATHWAY

	Fall	Spring
Year 1	MAT 1410 Pre-Calculus (4) ATM 1211 Survey of Meteorology I (2) ATM 1060 New Student Seminar (3)	MAT 1531 Calculus I (4) ATM 1212 Survey of Meteorology II (3)
Year 2	MAT 2532 Calculus II (4) PHY 2061 Classic Physics I (4) CIS 2101 Introduction to Unix (1) ATM 2061 Survey of Climate and Statistics I (2)	MAT 3533 Calculus III (4) PHY 2062 Classic Physics II (4) ATM 2062 Survey of Climate and Statistics II (3)
Year 3	ATM 3030 Atmospheric Thermodynamics (3) ATM 3140 Physical Meteorology (3) ATM 3331 Analysis and Forecasting (3)	ATM 3321 Atmospheric Dynamics I (3) ATM 3332 Analysis and Forecasting II (3)
Year 4	ATM 3322 Atmospheric Dynamics II (3) ATM 4120 Mesoscale Meteorology (3) ATM 4712 Capstone in Atmospheric Sciences I (2)	ATM 3110 Remote Sensing (3) ATM 4713 Capstone in Atmospheric Sciences II (2)

3-YEAR PATHWAY

	Fall	Spring
Year 1	MAT 2532 Calculus II (4) PHY 2061 Classic Physics I (4) CIS 2101 Introduction to Unix (1) ATM 1211 Survey of Meteorology I (2) ATM 1060 New Student Seminar (3)	MAT 3533 Calculus III (4) PHY 2062 Classic Physics II (4) ATM 1212 Survey of Meteorology II (3)
Year 2	ATM 2061 Survey of Climate and Statistics I (2) ATM 3030 Atmospheric Thermodynamics (3) ATM 3140 Physical Meteorology (3) ATM 3331 Analysis and Forecasting (3)	ATM 2062 Survey of Climate and Statistics II (3) ATM 3321 Atmospheric Dynamics I (3) ATM 3332 Analysis and Forecasting II (3)
Year 3	ATM 3322 Atmospheric Dynamics II (3) ATM 4120 Mesoscale Meteorology (3) ATM 4712 Capstone in Atmospheric Sciences I (2)	ATM 3110 Remote Sensing (3) ATM 4713 Capstone in Atmospheric Sciences II (2)

Note: These are suggested pathways only and will likely vary depending on student preparation. Each student must also take courses to fulfill at least one ATM concentration and all NVU degree requirements including at least 40 General Education foundation and elective credits.

ATMOSPHERIC SCIENCES CORE: (62 Credits)

Mathematics and Science Courses: (21 Credits)

- MAT 1531 - Calculus I Credits: 4
- MAT 2532 - Calculus II Credits: 4
- MAT 3533 - Calculus III Credits: 4
- CIS 2101 - Introduction to Unix Credits: 1
- PHY 2061 - Classic Physics I Credits: 4
- PHY 2062 - Classic Physics II Credits: 4

Atmospheric Sciences Courses: (41 Credits)

- ATM 1060 - New Student Seminar in Atmospheric Sciences Credits: 3
- ATM 1211 - Survey of Meteorology I Credits: 2
- ATM 1212 - Survey of Meteorology II Credits: 3
- ATM-2061 - Survey of Climate and Statistics I Credits: 2
- ATM-2062- Survey of Climate and Statistics II Credits: 3
- ATM 3030 - Atmospheric Thermodynamics Credits: 3
- ATM 3110 - Remote Sensing Credits: 3
- ATM 3140 - Physical Meteorology Credits: 3
- ATM 3321 - Atmospheric Dynamics I Credits: 3
- ATM 3322 - Atmospheric Dynamics II Credits: 3
- ATM 3331 - Analysis and Forecasting I Credits: 3
- ATM 3332 - Analysis and Forecasting II Credits: 3
- ATM 4120 - Mesoscale Meteorology Credits: 3
- ATM 4712 - Capstone in Atmospheric Sciences I Credits: 2
- ATM 4713 - Capstone in Atmospheric Sciences II Credits: 2

ATMOSPHERIC SCIENCES CONCENTRATIONS:

Climate Change (15 Credits)

- ATM 2210 - Geophysical and Human Interactions Credits: 3
- ATM 3050 - GIS Applications in Atmospheric Sciences Credits: 3
- ATM 4030 - Physical Climatology Credits: 3
- ATM 4040 - Physical Hydrology Credits: 3
- ATM 4140 - Climate Change Dynamics Credits: 3

National Weather Service/Military (15 Credits)

- Take one computer science course – choose from:
 - CIS 2060 – Programming with Fortran Credits: 3
 - CIS 2141 – Programming Internet and Web Apps Part I Credits: 3
 - CIS 2271 – Java Programming Credits: 3
- ATM 3050 - GIS Applications in Atmospheric Sciences Credits: 3
- ATM 4030 - Physical Climatology Credits: 3
- ATM 4040 - Physical Hydrology Credits: 3
- MAT 3310 - Introduction to Differential Equations Credits: 3

Broadcasting (14 Credits)

- ATM 2xxx – Workshop on Weathercasting Techniques Credits: 1
- ATM 3270 - Television Weather Graphics Credits: 1
- JOU 1125 – TV Production and Editing (EJA 1125 Visual Production I) Credits: 3
- COM/JOU 1221 – Interpersonal Communication (EJA 1221 Person to Person) Credits: 3
- COM/JOU 2843 – Junior Meteorology On Air Practicum Credits: 3
- COM/JOU 3222 – Senior Meteorology On Air Practicum Credits: 3

Graduate School (12-14 Credits)

- CHE 1031 - General Chemistry I Credits: 4
- MAT 3310 - Introduction to Differential Equations Credits: 3
- Choose a minimum of 2 credits from:
 - ATM 4140 – Climate Change Dynamics Credits: 3
 - CIS 2060 – Programming with Fortran Credits: 3
 - CIS 2279 – Introduction to Perl Programming Credits: 1
 - CIS 2290 – Introduction to Python Credits: 1
 - MAT 3135 – Statistical Computing in R Credits(s): 3
- Take one of the following:
 - MAT 3730 - Topics in Differential Equations Credits: 3
 - PHY 2063 - Classic Physics III Credits: 4

Private Industry (14-16 Credits)

- Take one business course - choose from:
 - BUS 2015 - Fundamentals of Management in Business Credits: 3
 - BUS 2230 - Principles of Marketing Credits: 3
 - BUS 3131 - Business Law I Credits: 3
 - ECO 2060 - Survey of Economics Credits: 4
- Choose a minimum of 2 credits from:
 - ATM 4140 - Climate Change Dynamics Credits: 3
 - CIS 2060 - Programming with FORTRAN Credits: 3
 - CIS 2141 - Programming Internet and Web Applications Part I Credits: 3
 - CIS 2279 - Introduction to Perl Programming Credits: 1
 - CIS 2290 - Introduction to Python Credits: 1
 - MAT 3135 – Statistical Computing in R Credits(s): 3
- Take one communications course - choose from:
 - COM/JOU 1010 Introduction to Media Communication Credits 3
 - COM/JOU 1221 – Interpersonal Communication (EJA 1221 Person to Person) Credits: 3
 - ENG 1280 Fundamentals of Speaking Credits: 3
 - ENG 3010 Advanced Composition and Rhetoric Credits: 3
 - OEL-1080 Leadership and Small Group Dynamics Credits 3
- Take one GIS course:
 - ATM 3050 - GIS Applications in Atmospheric Sciences Credits: 3
- Take one ATM elective - choose from:
 - ATM 2210 – Geophysical and Human Interactions Credits: 3
 - ATM 3170 - Weather Risk Assessment Credits: 3
 - ATM 3310 - Forecasting Applications Credits: 3
 - ATM 4030 - Physical Climatology Credits: 3
 - ATM 4040 - Physical Hydrology Credits: 3
 - ATM-4710 – Topics in Atmospheric Sciences Credits 3

ATMOSPHERIC SCIENCES Minor:

- ATM 1211 - Survey of Meteorology I Credits: 2
- ATM 1212 - Survey of Meteorology II Credits: 3
- ATM-2061 – Survey of Climate and Statistics I Credits: 2
- CIS-2101 – Introduction to UNIX Credits: 1
- MAT 1531 - Calculus I Credits: 4

Electives: **(6 Credits)**

6 credits chosen from among the ATM, CIS, ENV, MAT, or PHY 2000 or higher courses.

Note: ATM 4710 requires department permission.

Climate Change Science B.S.

Suggested pathway for core and elective classes (and credits) required for the CCS B.S. degree program

	Fall	Spring
Year 1	ATM 1211 Survey of Meteorology I (2) ATM 1060 New Student Seminar (3) ENV 1080 Intro to Environmental Science (4)	ATM 1212 Survey of Meteorology II (3) MAT 1410 Pre-Calculus (4) PHY 2031 Fundamental Physics I (4)
Year 2	ATM 3050 GIS in ATM (3) CLM 3061 Survey of Climate and Statistics I (2) BIO 1211 Intro to Biology (4)	CLM 3062 Survey of Climate and Statistics II (3) Communications elective course (3)
Year 3	CHE 1031 General Chemistry I (4) Interdisciplinary elective course (3-4)	ENV 2060 Energy, Environment, and Society (4) GEY 1111 Intro to Geology I (4)
Year 4	SCI 4900 Research in Science (2) BIO 4340 Env Challenges and Eco Solns (4) GEY 3110 Hydrogeology (4)	ATM 4030 Physical Climatology (3) SCI 4900 Research in Science (2) Interdisciplinary elective course (3-4)

Note: This is a suggested pathway only and will likely vary depending on student preparation. Each student must also take courses to fulfill all LSC degree requirements including at least 40 General Education foundation and elective credits.

Climate Change Science B.S.

Core courses:

- ATM 1060 – New Student Seminar in ATM Credits: 3
- ATM 1211 – Survey of Meteorology I Credits: 2
- ATM 1212 – Survey of Meteorology II Credits: 3
- CLM 3061 – Survey of Climate and Statistics I Credits: 2
- CLM 3062 – Survey of Climate and Statistics II Credits: 3
- ATM 3050 – GIS Apps in Atmospheric Sciences Credits: 3
- ATM 4030 – Physical Climatology Credits: 3
- BIO 1211 – Introduction to Biology Credits: 4
- BIO 4340 – Environmental Challenges and Ecological Solutions Credits: 4
- CHE 1031 – General Chemistry I Credits: 4
- ENV 1080 – Introduction to Environmental Science Credits: 4
- ENV 2060 – Energy, Environment, and Society Credits: 4
- GEY 1111 – Introduction to Geology I Credits: 4
- GEY 3110 – Hydrogeology Credits: 4
- MAT 1410 – Pre-Calculus Credits: 4
- PHY 2031 – Fundamental Physics I Credits: 4
- SCI 4900 – Research in Science Credits: 4

Choose one of the following communications courses:

- COM 2085 - Public Relations, Advertising, and Marketing Credit: 3
- ENG 1280 – Fundamentals of Public Speaking Credits: 3
- ENG 3010 – Advanced Composition and Rhetoric Credits: 3

JOU 1221 - Interpersonal Communication Credits: 3
OEL 1080 – Leadership and Small Group Dynamics Credits: 3
OEL 3110 – Public Relations Credits: 3

Choose two of the following courses, with at least one course at the 3000- or 4000-level:

ATM 2210 – Geophysical and Human Interactions Credits: 3
ATM 3030 – Atmospheric Thermodynamics Credits: 3
ATM 3170 – Weather Risk Assessment Credits: 3
BIO 3280 – Env toxicology Credits: 4
BIO 4040 – Ecology Credits: 4
BUS 3240 – Global business Credits: 3
CHE 2020 – Intro to Environmental Chemistry Credits: 4
CHE 3050 – Environmental Chemistry Credits: 4
COM 3080 – Strategic Media Communications Credits: 3
CRJ 2220 – Environmental Justice Credits: 3
ECO 2060 – Survey of Economics Credits: 4
GEY 4840 – Geologic Evolution: Grand Canyon to Mt. Whitney - Intensive
Credits: 4
PHI 2050 – Nature, Science, and Technology Credits: 3
PHY 2025 – Physics for the Environment Credits: 4
PHY 2032 – Fundamental Physics II Credits: 4

NVU Core Program curriculum (starting with the 2018-19 catalog)

First-Year Seminar (3 cr.)

Students entering with 15 or fewer credits take the First-Year Seminar.

Communicating in the World: Written Expression (6 cr.)

This two-course sequence focuses on clear and correct written expression, deepening one's comprehension of texts, developing critical thinking and research skills, and the rhetorical method of argument. This area includes ENG 1071 & 1072 (Johnson); and ENG 1081 & 1082 (Lyndon).

Mathematics and Computing in the World (6 cr.)

Courses in this area focus on quantitative reasoning and other mathematical ideas and techniques. This area includes courses in MAT and CIS.

Natural and Physical Worlds (4 cr., lab-based science course)

Courses in this area address natural phenomena, empirical reasoning, and/or the place of scientific and mathematical knowledge, in contemporary societies. This area may include courses from AHS, ATM, BIO, CHE, ENV, GEY, PHY, SCI, and XSC, among others.

Being in the World: Society and Behavior (6 cr.)

Courses in this area focus on individual wellbeing and development; social life and institutions; and/or individual and social behavior and change. This area may include courses from BUS, AHS, CRJ, ECO, EDU, PSY, SOC, POS, and WAM, among others.

Creativity in the World: Art and Aesthetics (6 cr.)

Courses in this area focus on creative processes and techniques used in the creation of original works of art as a medium for human expression. They may also address the human experience of artistic and natural forms, the role of artistic expression in society, and aesthetic attitudes. This area may include courses from ART, ARH, DAN, ENG, MUS, and THA, among others.

Diversity in the World: History and Culture (6 cr.)

Courses in this area focus on how human and cultural diversity have shaped and continue to shape societies and the world across regions, within particular contexts, and throughout time. This area may include courses from ANT, ARH, ENG, HIS, HUM, INT, PHI, and WAM, among others.

Enriched Course in Climate Change; Sustainability; or Social Justice (3-4 cr.)

This course is specifically designated as a Climate Change Enriched, Sustainability Enriched, or Social Justice Enriched course.

Guidelines:

1. Students may repeat a designator up to three times, but note the following:
 - a. Students take two ENG courses for Written Expression; they may take up to three additional ENG courses to fulfill other General Core requirements.
 - b. Students take two MAT courses for Mathematics and Computing, or one MAT and one CIS course; they may take up to three additional MAT courses to fulfill other General Core requirements.
2. Any course may be counted towards the major program as appropriate.