

# A New Climate Science Curriculum: Proposed Bachelor of Science Degree in Climatology at SUNY Oneonta

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## Abstract

In this work, we present a novel curriculum for a four-year Bachelor of Science degree in Climatology that has been proposed at SUNY Oneonta. The observable effects of climate change and the debate about what should be done to mitigate these effects have prompted a need for climate literacy among a broad section of the population. However, the field of climatology has traditionally been relegated to upper-division coursework within a department of meteorology, geography and/or geosciences or to graduate programs. Course prerequisites and the upper division designation pose barriers to students looking to gain introductory-level experience with climatology. We have developed an introduction to climatology course, without prerequisites, focusing on themes of energy, water, wind, and the interaction between the land surface and the atmosphere. It is anticipated that the introductory climatology class within the broader curriculum will become a general education course to attract non-majors. For those students looking to immerse themselves more fully in the field of climatology, a four year curriculum has been developed using a mixture of new climatology courses and existing meteorology and geography courses. While SUNY Oneonta would not be offering the first climate-related bachelor's degree in the US, other bachelors-level programs in climate focus more on policy or are tracks within majors in geography or meteorology. This curriculum was developed without the need for new faculty and is currently awaiting approval by state and university administration.

## Initial Motivators

**Student lack of understanding of Climate Science**

**Climate change perceived as a "political" rather than a "scientific" issue**

**Attrition in Meteorology major**

**Expertise of department faculty**

**Success of sustainability program that focuses on policy/activism**

## Two Tracks in Atmospheric Sciences

### B.S. Meteorology (Existing Track)

Introduction to Meteorology  
METR 110

Climate Change and Variability  
METR 212  
(Shared Course)

Weather Analysis and Forecasting  
METR 360, METR 361  
(Shared Courses)

Physical Meteorology  
METR 340  
(Requires Calculus II)

Atmospheric Dynamics  
METR 350

Mesoscale Meteorology  
METR 375

Research Methods  
METR 351  
(Shared Course)

Remote Sensing of the Atmosphere  
METR 385  
(Shared Course)

Atmospheric Radiative Transfer  
METR 380  
(Requires Calculus II)

Senior Seminar in Atmospheric Science  
METR 392  
(Shared Course)

### B.S. Climatology (Proposed Track)

Introduction to Climatology  
METR 111

Physical Climatology  
METR 240  
(Only Requires Calculus I)

Advanced Climatology  
METR 386

Paleoclimatology  
GEOL 351

Radiative Transfer of the Climate System  
METR 381  
(Only Requires Calculus I)



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By Michaela Webb/Arizona Sonora News on Mar 30, 2018 | 0 comments

## Why we like this plan

**Keeps the focus on Physical Science**

**Added expertise in Statistics and GIS**

**Removal of Calc II, Calc III and Differential Equations as barriers to degree in atmospheric science**

**Allows students to better market their expertise in Climate Science**

**Shared courses with meteorology major reduces need for additional faculty up front, though may be necessary later**

**Many new courses only required minor modifications of existing courses**

## Required Courses in Cognate Disciplines

### Meteorology (Existing Track)

CHEM111: Introduction to Chemistry  
MATH 223: Calculus I  
MATH 224: Calculus II  
MATH 276: Calculus III  
MATH 277: Ordinary Differential Equations  
PHYS 203: General Physics I  
PHYS 204: General Physics II  
GEOL 120: Introduction to Geology –or-  
GEOL 115: Science of Natural Disasters  
OCEA 110: Introduction to Oceanography  
CSCI 116: Fundamentals of Programming

### Climatology (Proposed Track)

GEOG 100: Introduction to Geography or-  
ENVS 110: Environmental sustainability  
CHEM111: Introduction to Chemistry or-  
CHEM 103: Chemistry of Nature  
MATH 223: Calculus I  
STAT 101: Introduction to Statistics  
STAT 201: Statistical Methods or-  
GEOL 350: Data Analysis in Geosciences  
PHYS 103 or 203: General Physics (Non-Calculus or Calculus-based)  
GEOG 201: Physical Geography of the Global Environment  
GEOG 241: Geographic Information Systems or-  
GEOG 244: Environmental Applications of GIS  
GEOG 341: Geographic Information Systems: Advanced Methods

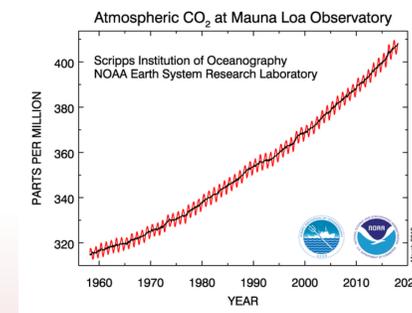
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**The Sahara is growing, thanks in part to climate change**

By Darryl Fears March 29 at 6:25 PM | Email the author

**More than half of Americans don't think climate change will affect them**

Jason Lemon - For the AJC  
Updated: 10:29 a.m. Friday, March 30, 2018 Filed in National/World News



## Who will we market to

- Students wanting a broad environmental/climate background from a scientific perspective
- Students who wish to major in Atmospheric Science but have struggled with the cognate math and science coursework
- Students wishing to study longer-term weather patterns over large spatial scales
- Students wishing to research climate change and make a difference in society

