

# AOS 102: Climate and Climate Change

Summer 2020 Syllabus – Offered online through Learn@UW via CANVAS

University of Wisconsin-Madison  
Atmospheric and Oceanic Sciences Department

## Course Information

<b>Course Number</b>	ATM OCN/GEOSCI 102 (640-102-001)
<b>Credits</b>	3
<b>Beginning Date</b>	June 15, 2020
<b>Number of Weeks</b>	8
<b>Class Web Site</b>	atmocn102: Climate and Climate Change (001) via CANVAS
<b>Meeting Times/Location/ Due Dates</b>	This is an online class with course content released on Fridays proceeding each week of class. Visit the forum frequently and be sure to post at least one comment/response each week to earn credit for class discussion. Full credit will be based on the quality rather than the quantity of your forum posts. (if you're posting more than 3 comments in one week, it better be good!) Unless otherwise noted, all assignments are due each Saturday at 11:59pm – 1 minute before midnight.
<b>Required readings</b>	Assigned weekly with links provided
<b>Instructor</b>	Steve Ackerman
<b>E-mail</b>	<a href="mailto:saackerm@wisc.edu">saackerm@wisc.edu</a> (Preferred contact – include <b>AOS 102</b> in subject line)
<b>Office Hours</b>	By appointment only
<b>Co-Instructor</b>	Margaret Mooney
<b>E-mail</b>	<a href="mailto:margaret.mooney@ssec.wisc.edu">margaret.mooney@ssec.wisc.edu</a> (include <b>AOS 102</b> in subject line)
<b>Office hours</b>	By appointment only
<b>Graduate TA</b>	Kate Abbott
<b>E-mail</b>	<a href="mailto:kaabbott@wisc.edu">kaabbott@wisc.edu</a> (include AOS 102 in subject line)
<b>Office hours</b>	ON-LINE Wednesdays from 4pm to 5pm, & by appointment
<b>Graduate TA</b>	James Winkleman
<b>E-mail</b>	<a href="mailto:jbwinkelman@wisc.edu">jbwinkelman@wisc.edu</a>
<b>Office Hours</b>	ON-LINE Tuesdays, 2-3pm, and by appointment

## Description

This on-line version of AOS 102 will provide a comprehensive overview on climate and climate change with a local focus on the Great Lakes Region. Course content will highlight concepts presented in several *Summary for Policy Makers* publications from the 2013 & 2014 Intergovernmental Panel for Climate Change (IPCC) Fifth Assessment as well as data from the 2014 National Climate Assessment (NCA) and 2019 climate data from NOAA and NASA.

## Core Abilities

- A. Science and Technology
- B. Critical thinking

## Sample Competencies

- A. Examine the differences between weather and climate

- B. Depict the role of solar forcing on the terrestrial climate
- C. Explore the different climatic regimes that are found on Earth
- D. Examine the importance of the water vapor and carbon dioxide gases in climate forcing.
- E. Explore the various cycles in the atmosphere that pertain to climate and climate change
- F. Demonstrate how climate normals change with time
- G. Explore climate regulators and feedbacks
- H. Explore climate models
- I. Explore recent changes in climate and the reasons behind the changes
- J. Demonstrate the impact of land-use changes & atmospheric changes on the Earth's climate
- K. Explore methods and policies to mitigate anthropogenic climate forcing

**Scheduled Weekly Topics - Summer 2020 – note: there is no required textbook**

<b>Week</b>	<b>Topics</b>	<b>Required Readings</b> <i>Additional on-line articles will be added to as appropriate</i>
6/15	Introduction to Climate and Climate Change (Includes Paleoclimatology & Classification Schemes)	Climate Change: Evidence and Causes <a href="http://dels.nas.edu/resources/static-assets/exec-office-other/climate-change-full.pdf">http://dels.nas.edu/resources/static-assets/exec-office-other/climate-change-full.pdf</a>
6/22	The Physical Science of Climate Change (Climate Regulators)	IPCC 2013 The Physical Science Basis Summary for Policy Makers <a href="http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WGIAR5_SPM_brochure_en.pdf">http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WGIAR5_SPM_brochure_en.pdf</a>
6/29	IPCC Overview, AR5 Observations of Climate Change and 2015 data from NOAA & NASA	IPCC 2014 Synthesis Report Summary for Policy Makers <a href="http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf">http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf</a>
7/6	Climate Modeling, IPCC Future Scenarios and Climate Mitigation	IPCC 2015 Mitigation of Climate Change Summary for Policy Makers <a href="http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf">http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf</a>
7/13	Societal Impacts, risks and vulnerabilities and Climate Adaptation	IPCC 2014 Impacts, Vulnerability and Adaptation <a href="http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgll_spm_en.pdf">http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgll_spm_en.pdf</a>
7/20	The U.S. National Climate Assessment and the 2016 USGCRP Climate & Health Assessment	USGCRP Climate & Health Assessment (executive summary) <a href="https://s3.amazonaws.com/climatehealth2016/high/ClimateHealth2016_ExecSummary_StandAlone.pdf">https://s3.amazonaws.com/climatehealth2016/high/ClimateHealth2016_ExecSummary_StandAlone.pdf</a> (expect lag time as document loads)
7/27	Changing Weather and Climate of the Great Lakes Region	An Assessment of the Impacts of Climate Change on the Great Lakes <a href="http://elpc.org/wp-content/uploads/2019/03/Great-Lakes-Climate-Change-Report.pdf">http://elpc.org/wp-content/uploads/2019/03/Great-Lakes-Climate-Change-Report.pdf</a> PAGES 1-20 & 39-46
8/3	Sustainability, career considerations and staying "Climate Smart".	UN 2015 Global Sustainable Development Report <a href="https://sustainabledevelopment.un.org/content/documents/1870GSDR_2015_Briefs.pdf">https://sustainabledevelopment.un.org/content/documents/1870GSDR_2015_Briefs.pdf</a>

**Grading Information**

**15 bonus points are available by completing the pre- and –post course survey (must complete both to earn credit)**

- |                                 |                             |                        |
|---------------------------------|-----------------------------|------------------------|
| <b>1) Forum discussion</b>      | <b>5 points weekly</b>      | <b>25% total grade</b> |
| <b>2) Weekly Quiz</b>           | <b>10 points most weeks</b> | <b>20% total grade</b> |
| <b>3) Activities/worksheets</b> | <b>Varies –</b>             | <b>20% total grade</b> |
| <b>4) Final Report/Project</b>  | <b>100 points</b>           | <b>35% total grade</b> |

**NOTE – no final exam**

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**Total: 100%**

**\*Guidelines for completing the final project will distributed during the 2nd week of class.**

## Approximate Grading Scale

<b>A</b>	<b>92 - 100 %</b>
<b>AB</b>	<b>87 - 91 %</b>
<b>B</b>	<b>81 - 86 %</b>
<b>BC</b>	<b>77 - 80 %</b>
<b>C</b>	<b>70 - 76 %</b>
<b>D</b>	<b>60 - 69 %</b>
<b>F</b>	<b>59 % or below</b>

**Forum Posts:** You are required to make at least one constructive forum post for each weekly forum topic posted under the "discussion" link in Learn@UW. These posts should answer any questions asked in within the forum topic, and should incorporate the use of course material from each week and also maintain scientific integrity. The grading rubric for forum posts is as follows:

Forum Post Score (out of 5 points total)

Score Description:

5	Student responds to forum topic by midnight Tuesday, maintains scientific integrity, answers all of the forum post questions using course concepts from the course materials and demonstrates mastery of the material. Student also makes one thoughtful response to a fellow students post by midnight Thursday. (ie. Uses scientific reasoning and logic rather than opinion-driven or politically driven reasoning to support response).
4	Student responds to forum topic during the school week, maintains scientific integrity, answers all of the forum post questions using course concepts from the course materials and demonstrates mastery of the material.
3	Student responds to forum during the school week, maintains scientific integrity and answers most of the forum post questions. Student uses course concepts from the course materials for that week, but exhibits comprehension errors.
2	Student responds to forum topic during the school week, maintains scientific integrity but only partially answers questions presented in the forum topic. (ie. post seems to have been thrown together at the last minute in order to get points for the post on-time).
1	Student responds to forum topic during the school week but does not address the forum topic &/or lacks scientific integrity (too opinion-driven and/or politically-driven)
0	Student DOES NOT respond to forum topic on time (before midnight Saturday).
-5	Student post a negative and/or derogatory comment lacking scientific value. Post is offensive and/or is disruptive to the forum discussion board.

**FINAL PROJECT:** The final project, worth 35% of your grade, is a study of the recent and future climate for one of three assigned locations consisting of descriptions that include weather and climate and how these may change under two different future emission scenarios. Environmental elements such as plants and land use change will be included in the discussion, as well as how changes at your assigned location relate to changes on a global scale. Overall, this project will allow you to demonstrate your knowledge and understanding of the aspects of climate and climate change covered throughout the semester. **\*Guidelines for completing the final project will be distributed during the 2nd week of class.**

## Guidelines for Success

### ADA Statement

We wish to fully include persons with disabilities in this course. Please let us know if you need any special accommodations in the curriculum, instruction, or assessments of this course to enable you to fully participate. We will maintain the confidentiality of any information you share.

### Academic Honesty

Students are expected to do their own work unless advised that collaboration is acceptable. This means that you may use facts from other sources if you re-write them in your own words. Anytime you quote directly from another source or paraphrase substantially, you must cite the source you used. When you take a test, you are expected to avoid Google search and only consult your notes.

Failure to use proper citation procedure is considered plagiarism. Plagiarism will result in a grade of "0" if it is flagrant and/or deliberate. Copying from another person's paper or test is academic dishonesty and will result in a grade of "0" for that assignment. In addition, you will be referred to student services for discipline based on college policy.

### Attendance

Attendance in the context of an online class means staying on schedule (all assignments are due by midnight on Saturday each week) and participating in the forum discussions. Class attendance contributes significantly to academic success. Students who attend classes regularly tend to earn higher grades and have higher passing rates in courses.

### Missed Assignments

Do not miss turning in assignments. You cannot make them up. There is a risk in waiting to the last moment to finish things. Unless otherwise noted, all assignments are due by midnight Saturday each week.

### Homework and On-line Activities

Homework and on-line activities will be given periodically throughout the semester. When doing homework, be sure to *show your work* and *use complete sentences*. It is your responsibility to find out about any homework and complete it on time. Homework assignments will be posted under "assignments" and released on Friday afternoons. Homework should be turned in by Saturday at midnight (or earlier!!). Late assignments cannot be turned in.

### Class Participation

In the context of an online class, Participation means participating in on-line discussions. There is **NO make-up for missed discussions and activities**. You are expected to contribute to the discussion at least once per week and to react to what your classmates are writing.

### Computer Use

This is an online class, so we expect you to have good internet access, and be aware of computer software. The class web site will contain students lecture materials, homework, and other materials. If any student is unable to access these materials, please contact the instructor.

### Additional Course Background

This class was originally developed with support from NASA. Updates to reflect 2013 IPCC and 2014 NCA findings were made possible by the UW-Madison Office of Sustainability.

### Advice

\*Please contact your instructors if you are concerned about your grade, your progress in the class, or if life has thrown a curve-ball at you and you are therefore having difficulties in participation or in completing the coursework.

\* Note that units of measure are always a part of correct answers (as applicable).

*This syllabus is a living document; it is subject to change by the instructors.*