

Course Syllabus: Meteorology, Climate, and Climate Change
McCoy College of Science, Mathematics, and Engineering
GEOS 3014
Spring 2024

Contact Information

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Course Description

This seminar-style course with selected lab and lecture components is focused on the scientific, political, psychological, ethical aspects of climate and climate change as well as efforts in the arts (e.g. literature and theater) to understand and mitigate the variety of technical, political, ethical, and sociological issues impacted by human-caused climate change. The course consists of several modules. The first module is focused on the Earth's climate system – present and past. The second module is focused on the variety of methods for potential mitigation of the varieties of impacts due to climate change. The third module is focused on how climate change has been approached from an ethical perspective as well as the depiction of climate change in the arts. The fourth and final module will address meteorology and how our weather and storm forecasts are generated. Lectures will be supplemented by significant activities focused on communicating climate change and its societal impacts, both short and long-term as well as the more mundane activities such as understanding how local and regional weather forecasts are developed. Individual and small group projects completed during the lab-portion of the course will focus on climate change impact and mitigation as well as climate change communication. Climate change will be approached from the perspective that it is one of the most significant “wicked problems” that will have a significant global impact over the next several decades. Several weeks at the course are devoted to Meteorology. Note that course content and the syllabus may be changed as needed to meet student interests.

Recommended Instructional Materials and Textbook

Instructional Materials: ***The Thinking Person's Guide to Climate Change: Second Edition Paperback – Illustrated, February 15, 2019***
by Robert Henson

Other Resources available online at no cost include various Climate Science Reports published by the US Global Change Research program, various USGS

Reports on Climate Change as well as various Intergovernmental Panel on Climate Change (IPCC) major reports 2013-2021.

Student Handbook

Refer to: [Student Handbook 2017-18](#)

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given). Additional guidelines on procedures in these matters may be found in the Office of Student Conduct.

[Student Handbook 2017-18](#)

Grading

Course grade will be determined as follows: (1) Participation – includes attendance, discussion, contribution, occasional “homework”, and preparation for the seminar sessions and occasional “labs” (40% of final grade); (2) Research paper and presentation on a specific topic TBD (25% of final grade); (3) Group project on a specific topic TBA (35% of final grade) and presentation to an Introductory Class (e.g. Physical Geology, Historical Geology, Life/Earth Science). Note: No work may be submitted after 4/30/2022.

Table 1: Points allocated to graded item or group of items discussed in the Grading Section above.

Graded Items	Contribution to Final Course Grade
Participation, Lab, and Homework	40%
Personal Research Paper and Presentation	25%
Group Project	35% (total)

Table 2: Final grade determination (grades are normally rounded up to the nearest integer before assigning the final course letter grade. This means, for example, that a final calculated course grade of 89.2% will be rounded up to a final course grade of 90.)

Grade	
A	90 and above
B	80-89
C	70-79
D	60-69
F	Less than 60

Homework

See Grading Section for details – Late submissions subject to significant penalties; see details above.

Lab Assignments

See Grading Section for details – Late submissions subject to significant penalties; see details above.

Exams

There are no exams for this seminar. Competency will be measured via individual participation as noted above and contribution to group projects/activities.

Personal Research Paper and Presentation

Research paper and presentation composite grade is 35% of final course grade. Research papers must be between 3500 and 7000 words (about 7-15 pages of text based on 11-pt or 12-pt font; word count per MSWord's word count tool) and be no longer than 30 total pages including illustrations and title page. Figures and/or tables (with captions) may be included within text or at end of the paper (proper credit must be given for figures, maps, pictures that you include in your report). Format for the report is MS Word or pdf file. The digital copy to be submitted per the course schedule/syllabus. Your paper must be organized as follows:

1. **Title and author name on front page.** Nothing else on the front-page, please!
2. **Abstract** – 500 word limit summarizing your paper including a sentence on why you chose the particular topic
3. **Introduction** – Opening paragraphs of your paper that describe the topic in general, its importance or application to you and the community, and why you choose the particular topic
4. **Main Body** – Discussion of what your research revealed to you and what you want to share with the reader
5. **Conclusion(s)** – the key message or “take-away” points that you expect the reader to remember
6. **References** – list of references you used to research and write your paper; minimum number of primary peer-reviewed (journal) references is five.

Failure to follow the organizational and heading structure given above is an automatic 10% grade deduction! Failure to follow the length requirement may result in additional 10% grade deduction. Failure to properly cite your sources in the paper or presentation may result in a 10% grade reduction - please make sure that for any map, picture, graph or other illustration that you included in your paper has the source/reference in the caption. Papers **and** presentations are due as per the syllabus schedule. Presentations must be 15-20 minutes long. PowerPoint format is suggested but not required though alternate formats should be pre-

cleared. Grade penalties for one letter grade for every two days late. Note: No work may be submitted after 4/30/2022. All Research Papers must be submitted in Microsoft Word or PDF format. Presentations to be submitted in MS PowerPoint or PDF Format. Presentations must follow any posted format "guidelines".

Extra Credit

There are no Extra Credit opportunities in this course.

Late Work

Late work will be accepted through 4/30/2020. Penalties per the text above may apply. No course assignments will be accepted after 4/30/2022.

Important Dates

Last Day to drop with a grade of "W:" 4pm, March 26, 2022

Refer to: [Drops, Withdrawals & Void](#)

Desire-to-Learn (D2L)

Some use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments, exam-related materials, and general course information. You can log into [D2L](#) through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Online Computer Requirements

Not applicable to this course.

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a 100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. As described below, two formulas (federal and state) exists in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

Services for Students With Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Clark Student Center, Room 168, (940) 397-4140. Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to [Disability Support Services](#).

College Policies

Campus Carry Policies; see: [Campus Carry Rules and Policies](#)

Smoking/Tobacco Policy

College policy strictly prohibits the use of tobacco products in any building owned or operated by WATC. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy

To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place, which prohibits the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Grade Appeal Process

Students who wish to appeal a grade should consult the Midwestern State University [Undergraduate Catalog](#)

Notice

Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor anytime during the semester. Changes will be communicated to all students through [D2L](#). Please check the course news on a regular basis for schedule updates.

Course schedule detail given on the next several pages. The first table lists lecture topics and assigned readings. The second table lists the dates for the labs, research paper presentations, possible homework "assignments", and time allocated for research and/or Celebration of Scholarship presentation preparations.

Course Schedule – Lecture Topics and Required Reading (Page 1 of 2)

Date	Topic and Topic Number	Textbook Pages TBA
17-Jan	Course Introduction and Overview; Topic 1 – Key Geological Concepts for Understanding Climate and Climate Change – Geological Time and Age Dating	None
19-Jan	Topic 1 - Continued	
22-Jan	Topic 2 – More Key Geological Concepts – Perspectives about Change, the Earth’s Origin, Structure, and Plate Tectonics	None
24-Jan	Topic 2 - Continued	
26-Jan	Topic 3 – More Key Geological Concepts – Perspectives about the Rate of Geological Processes; Short History of Earth	None
29-Jan	Topic 3 – Continued	
2-Feb	Topic 3 – Continued	
5-Feb	Topic 4 – The Earth’s Climate System: Overview	TBA
9-Feb	Topic 4 – Continued	
12-Feb	Topic 4 - Continued	
14-Feb	Topic 5 - Climate Change Over Time	TBA
16-Feb	Topic 5 – Continued	
19-Feb	Topic 5 – Continued	
21-Feb	Review	
23-Feb	Exam 1 – Details to be Announced	
26-Feb	Topic 6 – Climate Change Consequences	
28-Feb	Topic 6 – Continued	
1-Mar	Topic 6 – Continued	
4-Mar	Topic 7 – Wicked Problems	TBA

Course Schedule – Lecture Topics and Required Reading (Page 2 of 2)

Date	Topic and Topic Number	Textbook Pages TBA
6-Mar	Topic 7 – Continued	
8-Mar	Topic 8 – Mitigation and Public Policy Options	TBA
11-Mar	Spring Break – No Class	
13-Mar	Spring Break – No Class	
15-Mar	Spring Break – No Class	
18-Mar	Topic 8 – Mitigation and Public Policy Options Continued	
20-Mar	Topic 8 – Mitigation and Public Policy Options Continued	
22-Mar	Topic 8 – Mitigation and Public Policy Options Continued	
25-Mar	Review	
27-Mar	Exam 2 – Details to be Announced	
29-Mar	Topic 8 – Mitigation and Public Policy Options Continued	
1-Apr	Topic 8 – Mitigation and Public Policy Options Continued	
3-Apr	Topic 9 – Ethical Issues	TBA
5-Apr	Topic 9 – Ethical Issues Continued	
8-Apr	Topic 9 – Ethical Issues Continued	
10-Apr	Topic 10 – Meteorology Continued	
12-Apr	Topic 10 – Meteorology Continued	
15-Apr	Topic 10 – Meteorology Continued	
17-Apr	No Class	
19-Apr	Topic 10 – Meteorology Continued	
22-Apr	Topic 10 – Meteorology Continued	
24-Apr	Topic 10 – Continued – Last Day to Drop Course with a “W” is April 24	
26-Apr	Topic 10 – Continued	
29-Apr	Student Presentations	
1-May	Student Presentations (Continued)	
3-May	Review	
6-May	Final Exam (Exam 3) or Final Project Due at 10pm	

Course Schedule for "Lab" (Thursdays, 1:30-3:20pm, Bolin 115)

Date	"Lab" Activity	Homework and/or Miscellaneous Assignments
18-Jan	Lab 1 – Video – Boundaries	Video Summary #1
25-Jan	Lab 2 – TBA	None
1-Feb	Lab 3 – Uncertainty Modeling	TBA
8-Feb	Lab 4 – Introduction to Climate Modeling Using Simple Software	TBA
15-Feb	Lab 4 – Introduction to Climate Modeling Using Simple Software	TBA
22-Feb	Lab 5 - Climate Modeling Using Simple Software	TBA
29-Mar	Lab 6 - Climate Modeling 2 Using Simple Software	TBA
7-Mar	Lab 7 - Climate Modeling 3 Using Simple Software	TBA
14-Mar	No Lab	TBA
28-Mar	Meteorology Lab 1	Research Paper Topic Due
4-Apr	Meteorology Lab 2	
11 - Apr	Meteorology Lab 3	
18 - Apr	Meteorology Lab 4	Research Paper Due
25 - Apr	Research Presentations	
27 - Apr	Research Presentations	
3 - May	Last Day to Submit Any Late Assignments for Partial Credit by 11pm. Grade penalties per the course syllabus may apply.	

End of course syllabus