

Instructor:

Dr. Allison Wing

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Office: 423 Love Building

Office Hours: TBD, or by appointment

Lecture: Mondays and Wednesdays 2:30 - 3:45PM, 353 LOV

Prerequisites: MET 4301/5311, MET 4420/5425, MET 4450/5451, with grades of “C” or better, or permission of the instructor

Course Summary:

This course will cover the processes leading to extreme weather phenomena and how extreme weather phenomena are expected to change in a warming climate, with a focus on physical mechanisms. This includes extreme precipitation, floods, droughts, tropical cyclones, severe convective storms (including tornados and hail), extreme temperature, and heat waves. The course will explore connections between weather and climate, approaches of characterizing extreme events, and detection and attribution of long-term changes. These are active areas of current research, so the course will be structured around close reading and detailed discussion of contemporary papers in the peer-reviewed literature, supplemented with additional material as necessary.

Course Objectives:

1. Students will be able to assess the current state of knowledge about how each extreme weather phenomena are expected to change in a warming climate and where uncertainties remain.
2. Students will gain a conceptual understanding of the physical mechanisms behind the sensitivity of the occurrence, intensity, and impact of extreme weather phenomena to climate.
3. Students will develop critical reading skills and will learn how to review scientific papers.

Course Structure: Readings will be available on the course website, on Canvas. Each class period, we will read a scientific paper from the peer-reviewed literature about a particular topic and during class time, will hold a student-led discussion of the paper. All students must read the paper and identify the three key points of the paper and three questions they had about the paper (this will be turned in as a written assignment).

The student leader of the discussion that week will create a presentation summarizing the findings of the paper, the main tools used, and any problems or issues with the results. As the leader presents the paper, we will discuss the questions raised by other students. The student leader must turn in a written review of the paper. Depending on the subject matter, I may present relevant background material prior to the student-led paper discussion.

The final paper will discuss the relationship between a specific extreme weather phenom-

ena and climate change, written for a general audience. A list of potential topics will be provided.

Grading Policy:

You must complete your written assignments independently; copying a classmate's work or plagiarizing is a breach of the FSU Academic Honor Policy (see below). As participation in the discussion is a vital component of the class, attendance is required unless pre-arranged with the instructor or excused in accordance with the University Attendance Policy (see below).

- Participation in discussion (including but not limited to attendance): 15%
- Written assignments for all papers discussed: 15%
- Presentation of paper(s) about specific topic: 20%
- Written review of paper(s) about specific topic: 25%
- Final paper: 25%

Criteria for Assessment:

Specific points-based schemes used to mark individual assignments will be discussed as appropriate at the time of assignment.

- A- to A: Demonstrates a deep understanding of material. Exhibits a high level of insight and originality.
- B- to B+: Demonstrates a sound understanding of material and some level of insight and originality. Few errors.
- C- to C+: Demonstrates a sufficient understanding of material. Moderate errors. Little insight or originality.
- D- to D+: Demonstrates little understanding of material. Many errors. No insight or originality.
- F: Makes an insufficient attempt to complete required work. Demonstrates a serious lack of understanding of material.

The following grading standards will be used in this class:

Grade	Range	Grade	Range	Grade	Range
–	–	A	94% to 100%	A-	90% to 93%
B+	87% to 89%	B	84% to 86%	B-	80% to 83%
C+	77% to 79%	C	74% to 76%	C-	70% to 73%
D+	67% to 69%	D	64% to 66%	D-	60% to 63%
–	–	F	59% and below	–	–

Late Assignments:

Assignments turned in after the stated deadline will not be accepted and will be assessed a score of 0 % unless either a) a prior arrangement was agreed upon between the instructor and student , or b) mitigating circumstances permitted an excused absence on the due date of the assignment (see below for university attendance policy).

University Attendance Policy:

Excused absences include documented illness, deaths in the family and other documented

crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy:

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to "... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://fda.fsu.edu/Academics/Academic-Honor-Policy>.)

Free Tutoring from FSU:

On-campus tutoring and writing assistance is available for many courses at Florida State University. For more information, visit the Academic Center for Excellence (ACE) Tutoring Services' comprehensive list of on-campus tutoring options - see <http://ace.fsu.edu/tutoring> or contact tutor@fsu.edu. High-quality tutoring is available by appointment and on a walk-in basis. These services are offered by tutors trained to encourage the highest level of individual academic success while upholding personal academic integrity. ă

Americans with Disabilities Act:

Students with disabilities needing academic accommodation should:

- (1) register with and provide documentation to the Student Disability Resource Center; and
 - (2) bring a letter to the instructor indicating the need for accommodation and what type.
- This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact:

Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Florida State University
Tallahassee, FL 32306-4167
(850) 644-9566 (voice)
(850) 644-8504 (TDD)
sdrc@admin.fsu.edu
<http://www.disabilitycenter.fsu.edu/>

Syllabus Change Policy:

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

Tentative Course Schedule: (subject to change)

Date	Topic	Required Reading
Jan 7	Course Logistics	
Jan 9	Overview	IPCC Special Report on Extremes
Jan 14	Attribution of Extreme Weather Events	National Academies Report
Jan 16	Heat Waves I	Stott et al. (2004)
Jan 23	Heat Waves II	Schar et al. (2004)
Jan 28	Precipitation Extremes Intro	
Jan 30	Precipitation Extremes I	Groisman et al. (2005)
Feb 4	Precipitation Extremes II	Allen & Ingram (2002)
Feb 6	Precipitation Extremes III	O’Gorman & Schneider (2009)
Feb 11	Extreme Snowfall	O’Gorman (2014)
Feb 13	Tropical Cyclones I	Emanuel (2005)
Feb 18	Tropical Cyclones II	Webster et al. (2005)
Feb 20	Tropical Cyclones III	Klotzbach & Landsea (2015)
Feb 25	Tropical Cyclones IV	Knutson et al. (2010)
Feb 27	Tropical Cyclones IV	
Mar 4	Tropical Cyclones V	Emanuel (2013)
Mar 6	Drought I	Diffenbaugh et al. (2015)
Mar 11	Drought II	Trenberth et al. (2014)
Mar 13	Wildfires	Abatzoglou and Williams (2016)
Mar 25	Floods	Milly et al. (2002)
Mar 27	Severe Convective Storms Intro	
Apr 1	Severe Convective Storms I	Diffenbaugh et al. (2013)
Apr 3	Severe Convective Storms II	
Apr 8	Extratropical Cyclones Intro	
Apr 10	Extratropical Cyclones	Shaw et al. (2016))
Apr 15	Extreme Cold Events Intro	
Apr 17	Extreme Cold Events	Gao et al. (2015)
Apr 22	Arctic Amplification & Mid-Latitude Weather I	Francis & Vavrus (2012)
Apr 24	Arctic Amplification & Mid-Latitude Weather II	Barnes & Screen (2015)