Climate and Climate Variability – ATSC 4335.001
Department of Physical and Environmental Sciences
Fall 2020

A. COURSE INFORMATION
Course number/section: ATSC 4335.001
Class meeting time: TR 2:00 PM - 3:15 PM
Class location: Fully Online
Course Website: https://bb9.tamucc.edu

B. INSTRUCTOR INFORMATION
Instructor: Dr. Feiqin Xie
Office location: NRC 3507
Office hours: WebEx: TR 12:00PM-1:30PM; 3:30PM-5:00PM or by appointment
Telephone: 825-3229
e-mail: feiqin.xie@tamucc.edu (preferred contact method)
Appointments: Email for appointment

C. COURSE DESCRIPTION
Catalog Course Description
Course intended to guide environmental science majors in developing a conceptual understanding of Earth’s global climate and its variability. The past climates, present mean state of the climate system, climate variability from seasonal to multidecadal time scales, and climate change will be reviewed. Special attention will be given to climates of the Gulf of Mexico, Caribbean Sea and surrounding land regions. Plausible climate-change scenarios, mitigation and adaptation strategies, and relevant policy issues will also be discussed.

Extended Course Description
None

D. PREREQUISITES AND COREQUISITES
Prerequisites
ATSC/ESCI 3403 (Meteorology) or ESCI 3351 (Oceanography), and PHYS 1401 (General Physics I) or PHYS 2425 (University Physics I), or instructor’s consent.

Corequisites
None

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
Required Textbook(s)

**Optional Textbook(s) or Other References**


**Supplies**

None

**F. STUDENT LEARNING OUTCOMES AND ASSESSMENT**

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Survey the key elements of the Earth’s climate system and explore the physical basics of the climate science;
2. Examine the climate data record of the past climates and the present mean state of the atmosphere and oceans;
3. Explain the major climate variability, specifically the El Niño and La Niña, decadal variability, and multi-decadal variability;
4. Apply the basic tool to analyze the climate time series and derive climate variability;
5. Evaluate various global warming scenarios, human influence on climate change and strategies for mitigation and adaptation.

**G. INSTRUCTIONAL METHODS AND ACTIVITIES**

Fully online with real-time lecture presentation and discussion. All lectures will be recorded and posted on blackboard after the lecture. Students will access and submit all the homework, quizzes, and exams through blackboard. Online discussions forum will be created in blackboard. Students could directly interact with the instructor during the lecture and the regular online office hours through WebEx or through the discussion forum in the blackboard.
H. MAJOR COURSE REQUIREMENTS AND GRADING

The final grade will come from: quizzes and participation (10%), homework (50%), midterm (20%), and final exam (20%). Letter grades will be assigned as follows: A = 90-100%, B = 80-89.99%, C = 70-79.99%, D = 60-69.99% F = 0-59.99%.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
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<tbody>
<tr>
<td>Exams (Mid-term / Final)</td>
<td>40% (20% / 20%)</td>
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<tr>
<td>Homework</td>
<td>50%</td>
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<tr>
<td>Quizzes</td>
<td>10%</td>
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I. COURSE CONTENT/SCHEDULE

The outline of lecture topics and major due dates are listed below.

<table>
<thead>
<tr>
<th>WEEK</th>
<th>DATE</th>
<th>TOPIC</th>
<th>CHAPTERS</th>
<th>ASSIGNMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>08-20</td>
<td>Introduction</td>
<td>WB. 1</td>
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<tr>
<td>2</td>
<td>08-25</td>
<td>Basics of Climate Sciences</td>
<td>WB. 2, 3, 5</td>
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<tr>
<td>3</td>
<td>09-01</td>
<td>(Continued)</td>
<td></td>
<td>HW-01</td>
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<tr>
<td>4</td>
<td>09-08</td>
<td>Drivers</td>
<td>WB. 3, 6, 7</td>
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<tr>
<td>5</td>
<td>09-15</td>
<td>The Climate Before 1880</td>
<td>WB. 4, 8</td>
<td>HW-02</td>
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<tr>
<td>6</td>
<td>09-22</td>
<td>The Climate Since 1880</td>
<td>WB. 4</td>
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<tr>
<td>7</td>
<td>09-29</td>
<td>Feedback &amp; Abrupt Change</td>
<td>WB. 6</td>
<td>HW-03</td>
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<tr>
<td>8</td>
<td>10-06</td>
<td>10-08</td>
<td>Mid-term Exam</td>
<td>EXAM-I</td>
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<tr>
<td>9</td>
<td>10-13</td>
<td>Local Modifications</td>
<td>Class Notes</td>
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<tr>
<td>10</td>
<td>10-20</td>
<td>Climate Models and Future</td>
<td>WB. 10, 11; JH. 5</td>
<td>HW-04</td>
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<tr>
<td>11</td>
<td>10-27</td>
<td>(Continued)</td>
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<tr>
<td>12</td>
<td>11-03</td>
<td>Adaptation and Mitigation</td>
<td>WB. 9; BM. 10</td>
<td>HW-05</td>
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<tr>
<td>13</td>
<td>11-10</td>
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<tr>
<td>14</td>
<td>11-17</td>
<td>Policy</td>
<td>BM.11,12;JH.10</td>
<td>HW-06</td>
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<td>15</td>
<td>11-24</td>
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<td>Last Class</td>
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<td>16</td>
<td>12-01</td>
<td>Final Exam (1:45 PM)</td>
<td>EXAM-II</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning
Outcomes described in Section F. References: WB: William J. Burroughs; JH: John Houghton; BM: Bert Metz.

J. COURSE POLICIES

COVID-19

Face Coverings—Face coverings (cloth face covering, surgical mask, etc.) must be properly worn in all non-private spaces including classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study spaces, libraries, academic resource and support offices, and outdoor spaces where 6 feet of physical distancing is difficult to reliably maintain. Extra masks will be made available if needed.

- Quizzes/Attendance/Tardiness
  Random quizzes will be given out during the lecture time in the semester to account for the attendance. The full credit will account for 10% to the final grade. Make-up quizzes will not be allowed without the instructor’s permission.

- Late Work and Make-up Exams
  Assigned work is due by the stated deadlines. You may always turn in assignments early. Except for excused absences, the grade of late assignment will be reduced by up to 20% each day after the deadline. If you know in advance that you will have an excused absence when an assignment is due, you must turn in that assignment before its due date. You should turn in assignments that were missed because of an unexpected, excused absence as soon as possible.
  There will be NO make-up exams except in extremely rare cases in which some unforeseen crisis/emergency arises. If you know ahead of time that you have a conflict with the exam schedule, discuss this with me as soon as possible to make arrangements for the exam. Do not expect to arrange different exam schedules simply because it is more convenient.

- Extra Credit
  Limited extra credit opportunities will be available. Extra credit work must be submitted by the stated deadlines, which will be announced upon specific notice during the semester.

- Cell Phone Use
  Cellphones should be silenced. No phone conversations are allowed during the class. Cell phone can be prudently used for crucial in-class communications, such as notetaking, or recording. Distraction, annoyance, or nuisance by the use of any device will be addressed immediately by the instructor and the student will have the option of discontinuing its use or exiting the classroom (resulting in a recorded absence).

- Laptop Use
Student is welcomed to use a laptop or other device access online class to facilitate the learning experience (e.g., takes notes, research an issue, etc.). The use of laptops for other reasons is discouraged as it distracts the learning experience.

- **Food in Class and Lab**
  Students’ schedules may be hectic and may not allow time between classes for meals. If consuming food and drink during the lecture, please respect the others and make sure your speaker is muted.

**K. COLLEGE AND UNIVERSITY POLICIES**

- **Academic Integrity (University)**
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course. Should dropping the course be the best course of action,
you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C0.03, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is required to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C0.03, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://academicaffairs.tamucc.edu/rules_procedures/assets/13.02.99.c0.03_student_grade_appeals.pdf](http://academicaffairs.tamucc.edu/rules_procedures/assets/13.02.99.c0.03_student_grade_appeals.pdf). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

[http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

- **Civil Rights Complaints**
  Texas A&M University-Corpus Christi is committed to fostering a culture of caring and respect that is free from discrimination, relationship violence and sexual misconduct, and ensuring that all affected students have access to services. For information on reporting Civil Rights complaints, options and support resources (including pregnancy support accommodations) or university policies and procedures, please contact the University Title IX Coordinator, Sam Ramirez (Samuel.ramirez@tamucc.edu) or Deputy Title IX Coordinator, Rosie Ruiz.
(Rosie.Ruiz@tamucc.edu) x5826, or visit website at Title IX/Sexual Assault/Pregnancy.

Limits to Confidentiality. Essays, journals, and other materials submitted for this class are generally considered confidential pursuant to the University's student record policies. However, students should be aware that University employees, including instructors, are not able to maintain confidentiality when it conflicts with their responsibility to report alleged or suspected civil rights discrimination that is observed by or made known to an employee in the course and scope of their employment. As the instructor, I must report allegations of civil rights discrimination, including sexual assault, relationship violence, stalking, or sexual harassment to the Title IX Coordinator if you share it with me.

These reports will trigger contact with you from the Civil Rights/Title IX Compliance office who will inform you of your options and resources regarding the incident that you have shared. If you would like to talk about these incidents in a confidential setting, you are encouraged to make an appointment with counselors in the University Counseling Center.

L. OTHER INFORMATION

• Academic Advising
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.