Climate and Climate Variability – ESCI 4335.001
Department of Physical and Environmental Sciences
Spring 2019

A. COURSE INFORMATION

Course number/section: ESCI 4335.001
Class meeting time: TR 2:00 PM - 3:15 PM
Class location: BH-205
Course Website: https://bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Dr. Feiqin Xie
Office location: NRC 3507
Office hours: TWR 9:00 AM - 11:00 AM or by appointment
Telephone: 825-3229
e-mail: feiqin.xie@tamucc.edu
Appointments: Email or call 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
ESCI 3351 Oceanography and/or ATSC/ESCI 3403 Introduction to Meteorology 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
In class presentation and discussion.

H. MAJOR COURSE REQUIREMENTS AND GRADING
The final grade will come from: attendance 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>
</thead>
<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>Attendance</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>01-15</td>
<td>Introduction</td>
<td>WB. 1</td>
<td></td>
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<tr>
<td>2</td>
<td>01-22</td>
<td>Basics of Climate Sciences</td>
<td>WB. 2, 3, 5</td>
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<tr>
<td>3</td>
<td>01-29</td>
<td>Drivers</td>
<td>WB. 3, 6, 7</td>
<td>HW-01</td>
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<tr>
<td>4</td>
<td>02-05</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>02-12</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>02-19</td>
<td>The Climate Since 1880</td>
<td>WB. 4</td>
<td></td>
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<tr>
<td>7</td>
<td>02-26</td>
<td>Feedback &amp; Abrupt Change</td>
<td>WB. 6</td>
<td>HW-03</td>
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<tr>
<td>8</td>
<td>03-07</td>
<td>Mid-term Exam</td>
<td></td>
<td>EXAM-I</td>
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<tr>
<td>9</td>
<td>03-11/15</td>
<td>Spring Break</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>03-19</td>
<td>Local Modifications</td>
<td>Others</td>
<td></td>
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<tr>
<td>11</td>
<td>03-26</td>
<td>Climate Models and Future</td>
<td>WB. 10, 11; JH. 5</td>
<td>HW-04</td>
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<tr>
<td>12</td>
<td>03-28</td>
<td></td>
<td></td>
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<tr>
<td>13</td>
<td>04-02</td>
<td></td>
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<tr>
<td>14</td>
<td>04-09</td>
<td>Adaptation and Mitigation</td>
<td>WB. 9; BM. 10</td>
<td>HW-05</td>
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<tr>
<td>15</td>
<td>04-16</td>
<td></td>
<td>BM. 11, 12; JH. 10</td>
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<tr>
<td>16</td>
<td>04-23</td>
<td>Policy</td>
<td></td>
<td>HW-06</td>
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<td>17</td>
<td>04-30</td>
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<td>Last Class</td>
<td></td>
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<td>17</td>
<td>05-07</td>
<td>Final Exam (1:45 PM)</td>
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<td>EXAM-II</td>
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</table>

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

Students are expected to attend all scheduled classes and to participate in class activities. Group discussions are encouraged. However, you are supposed to work out any assignments individually. Work handed in is assumed to be yours, unless specified to be a group project. Please note that university alcohol and drug policies are strictly enforced.

- **Attendance/Tardiness**
  Random attendance sheet will be handed out during the semester. The full attendance will earn 10% credit to the final grade.

- **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 in 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 bring a laptop or other device to 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 in the lecture classroom please respect the facilities by cleaning up all spills immediately and removing all trash.

### 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.C2.01, 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 encouraged 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.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). 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/

Statement of Academic Continuity
In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

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.