SYNOPTIC METEOROLOGY (ATSC3401)
Department of Physical and Environmental Sciences
Fall 2019

A. COURSE INFORMATION
Course number/section: ATSC3401.001
Class meeting time: TR 11:00-12:15
Class location: EN400
Course Website: http://bb9.tamucc.edu

B. INSTRUCTOR INFORMATION
Instructor: Chuntao Liu
Office location: NRC1109
Office hours: MWF 8:00AM-noon
Telephone: 361-825-3845
e-mail: chuntao.liu@tamucc.edu
Appointments: available by email or phone

C. COURSE DESCRIPTION
Catalog Course Description
This course focuses on introducing middle-latitude synoptic weather phenomenon, including planet waves, frontal systems etc. We will apply principles of Dynamic Meteorology in regards to processes in the atmosphere, weather elements and forecasting. We will examine the structure and dynamics of these systems by integrating weather observations with the current state of dynamic theory, numerical weather prediction models, and the physical principles of atmospheric thermodynamics and cloud and precipitation physics.

Extended Course Description
The lab is vital to the course content. Students who complete ATSC 3401 & 3401(L) will have a good start toward the essentials of the Forecaster’s Art. We will pay close attention to daily weather during the lectures. Students will be required to give weather forecast discussions to develop an understanding of the weather forecasting process, and gain experience in communicating weather forecasts.

The instructors of this course will provide the students with: (1) information in the form of lectures, handouts, assigned readings, and supplemental readings; and (2) advice, supervision, and guidance. In lecture, students will spend most of the course learning about how to interpret the weather phenomenon by using the modern observations from radar, satellite and numerical model output.

D. PREREQUISITES AND COREQUISITES
Prerequisites
ATSC3403 or ESCI3403
Corequisites
ATSC3401-101 is required to be registered with this class

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)
None.

Optional Textbook(s) or Other References
Mid-Latitude Weather Systems, -by T.N. Carlson

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.

The goal of this course is to provide the students with an opportunity to learn about the evolution, form, and function of synoptic weather systems. Rather than just learning to identify “synoptic weather” students should be able to coherently illustrate, explain, discuss, critique, etc. basic concepts of synoptic phenomenon. Students should attend and participate in lectures and lab. For all components that are examined within each topic in the schedule, the student will be expected to…

- Demonstrate understanding of the mechanisms of the synoptic weather systems, as well as the physics behind the initiation of precipitation, mature, and dissipation of systems.
- Demonstrate understanding of the fundamental principle of mid-latitude synoptic weather systems and how to interpret the numerical weather prediction products.
- Communicate the synoptic weather analysis in a professional and effective manner
G. INSTRUCTIONAL METHODS AND ACTIVITIES

Traditional lectures via board demonstrations and power point presentations, classroom discussions, and student homework, reading, and projects. Homework will consist of assigned readings and critical analysis.

H. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Overall Percentage</th>
<th>Grade</th>
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<tbody>
<tr>
<td>Class Participation</td>
<td>5%</td>
<td></td>
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<tr>
<td>Homeworks:</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>Final Project:</td>
<td>25%</td>
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<tr>
<td>Total:</td>
<td>100%</td>
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I. COURSE CONTENT/SCHEDULE

Tentative Lecture Schedule:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Class introduction and overview of instrumentation</td>
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<tr>
<td>2</td>
<td>Introduction of the surface and balloon observations</td>
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</table>
3 Review of fundamental mathematical concepts
4-6 Review of basic atmospheric concepts
7-9 Fronts and Jets
10-12 Quasi-geostrophic theory, thermal wind
13-14 Principle of Tropical cyclones
15 Moist convection and severe weather

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.

J. COURSE POLICIES

Attendance/Tardiness
It is in the best interest of students to attend each class, because of the weight placed on the lectures in the homework and exams. Participation is essential to do well in the class, which includes in-class discussion and direct communication with the instructor and peers.

Late Work and Make-up Exams
Assignments are expected on time unless prior arrangements are made. Such prior arrangements will be granted only in exceptional circumstances as well. Without prior arrangement, the late homework has a 10% deduction if turned in prior to grading of other assignments and 20% if turned in after graded assignments are returned.
Class exams cannot be retaken other than for an excused absence. Excused absences are limited to medical emergencies that can be certified in writing by a physician, participation in a TAMUCC sanctioned event or other similar circumstances justified in writing and specified in the TAMUCC graduate catalog for the ongoing academic year.

Extra Credit
None

Cell Phone Use
Prohibited during the class

Laptop Use
A personal laptop is encouraged, but not required

Food in Class
Not allowed in the lab
Missed Exam
Unless with a doctor’s note, no make-up exam.

Participation
Important for both class and lab.

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.tamu.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.tamu.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamu.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.tamu.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.