A. COURSE INFORMATION
Course number/section: ATSC 3305.001
Class meeting time: MW 2:00-3:15PM
Class location: CS 112
Course Website: http://bb9.tamu.edu

B. INSTRUCTOR INFORMATION
Instructor: Pat Fitzpatrick
Office location: CS243
Office hours: Mon,Wed 4-6PM, Thur 1:15-3:15PM
Telephone: 361-825-4061
e-mail: patrick.fitzpatrick@tamucc.edu
Appointments: Available by email, phone request, or videoconference. Videoconferences are especially productive and convenient for students. I’m often accessible by videoconference in the evenings and Sunday night. Email me a for a videoconference, and I’ll setup a session with Zoom software.

C. COURSE DESCRIPTION
Catalog Course Description
This course will cover the fundamentals of atmospheric physics including the atmospheric composition, kinetic theory of gases, moist processes, aerosol, solar and terrestrial radiation, scattering of electromagnetic radiation, radiative transfer, and planetary boundary layer.

Extended Course Description
This class will cover atmospheric composition, aerosols, and dispersion; cloud microphysics and precipitation process; lightning; optics and scattering; acoustics; and fog. Computer application example applications will be applied to lecture material. Time will be set aside for in-class exercises, and attendance is extremely important for learning. Study sessions will also be performed before exams. A study guide is provided.

D. PREREQUISITES AND COREQUISITES
Prerequisites
ATSC 2403 (Introduction to Meteorology) and PHYS 2426 (University Physics II), or instructor’s consent.

Corequisites

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

Optional Textbook(s) or Other References
None

Supplies
Students should buy a binder (to keep notes and assignments) and a set of colored pencils and/or pens (helpful during math derivations).

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 overall goal of this course is to provide students a foundation in physical meteorology that is suitable for professional employment and/or advanced study in atmospheric sciences.

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

- Exhibit critical thinking when confronting new information;
- Apply the mathematical and physical foundations of meteorology to solve problems using analytical and computational methods;
- Explain moist processes related to cloud and precipitation formation;
- Explain the basic physics of light scattering by small particles, and explain the reasons for the spectrum of colors observed in the sky;
- Explain electrification processes;
- Explain how sound propagation is attenuated, and how its spectral or temporal characteristics change
- Predict fog formation
- Expound on weather modification applications

G. INSTRUCTIONAL METHODS AND ACTIVITIES
My teaching philosophy combines theory with practical, up-to-date applications. Students will not just learn math derivations, but acquire the physical understanding of processes. Students will be able to expound on the mathematical processes, verbally explaining the theories, and perform real-world meteorology and oceanography examples. Learning material is a blend of notes, supplemental documents, pertinent websites, videos, and COMET modules. Every third-
class period will be devoted to on-hands training of the mathematical concepts to reinforce retention of this difficult material.

H. MAJOR COURSE REQUIREMENTS AND GRADING

The final letter grade will be based on the percentage you earn out of a possible 100 points, which are distributed as follows:

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams</td>
<td>55</td>
</tr>
<tr>
<td>Homework</td>
<td>20</td>
</tr>
<tr>
<td>Final exam</td>
<td>25</td>
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</tbody>
</table>

You are expected to independently solve the problems though discussions among classmates are allowed. Some questions will be unique to each student to encourage solo activity. Please hand in your assignments at beginning of the class on the due day. Late homework will include a cumulative 10% penalty for every 2 days late unless a valid excuse is provided to the instructor. Valid excuses include severe illness, conference participation, and field project participation.

I. COURSE CONTENT/SCHEDULE

Tentative Lecture Schedule:

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1-2</td>
<td>Atmospheric composition, aerosols</td>
</tr>
<tr>
<td>2-3</td>
<td>Aerosol special topics - dispersion, fog</td>
</tr>
<tr>
<td>4</td>
<td>Exam 1</td>
</tr>
<tr>
<td>4-8</td>
<td>Optics and scattering</td>
</tr>
<tr>
<td>7-9</td>
<td>Cloud microphysics and precipitation processes</td>
</tr>
<tr>
<td>9</td>
<td>Exam 2</td>
</tr>
<tr>
<td>9-10</td>
<td>Acoustics, atmospheric electrification</td>
</tr>
<tr>
<td>11-12</td>
<td>Weather modification</td>
</tr>
<tr>
<td>12</td>
<td>Exam 3</td>
</tr>
<tr>
<td>13-14</td>
<td>Review of semester</td>
</tr>
<tr>
<td>15</td>
<td>The final exam schedule is at:</td>
</tr>
<tr>
<td></td>
<td><a href="https://registrar.tamucc.edu/Register%20for%20Classes/Final_Exams.html">https://registrar.tamucc.edu/Register%20for%20Classes/Final_Exams.html</a></td>
</tr>
</tbody>
</table>
is scheduled on Thursday, May 14, 1:45PM

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 the best of student’s interest 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% cumulative deduction for every 2 days late.

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 will be essential for the homework in this class.

Food in Class
Not allowed in the lab

Missed Exam
Unless with a doctor’s note, no make-up exam.

Participation
Exceptionally important during hands-on exercises!
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/) 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, and the College of Science and Engineering Grade Appeals webpage at 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.