Course Change Request

Date Submitted: 01/26/18 4:48 pm

Viewing: ATMO 201: Weather and Climate

Last edit: 02/21/18 9:30 am
Changes proposed by: korty

Systems Track
- BS-APMS-ACT: Applied Mathematical Sciences - BS, Actuarial Emphasis
- BS-APMS-CPS: Applied Mathematical Sciences - BS, Computational Emphasis
- BS-APMS-ECO: Applied Mathematical Sciences - BS, Economics Emphasis
- BS-APMS-STA: Applied Mathematical Sciences - BS, Statistics Emphasis
- BS-USUC-SS: University Studies - BS, Science for Secondary Teaching Concentration
- BS-APMS: Applied Mathematical Sciences - BS, Math Emphasis

Faculty Senate Number

Contact(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>E-mail</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robert Korty</td>
<td><a href="mailto:korty@tamu.edu">korty@tamu.edu</a></td>
<td>9798479090</td>
</tr>
</tbody>
</table>

Rationale for Course

Edit
Other

We have taught a section of ATMO 201 online each summer. I am updating the information here to document that those "nontraditional" sections conform to the same standards as our face-to-face regular semester meetings.

Course prefix ATMO Course number 201

Department Atmospheric Sciences
College/School Geosciences
Academic Level Undergraduate

Undergraduate course level justification (Select One)

Academic Level (alternate) Graduate
Effective term 2018-2019

Complete Course Title Weather and Climate
Abbreviated Course Title WEATHER & CLIMATE

Catalog course description
Structure, energy, and motions of the atmosphere; climate; fronts and cyclones; atmospheric stability; clouds and precipitation; severe storms.

Prerequisites and Restrictions

Concurrent Enrollment No
Should catalog prerequisites / No

Approval Path
1. 02/20/18 3:22 pm
   Ping Yang (pyang): Approved for ATMO Department Head
2. 02/21/18 9:31 am
   Sandra Williams (sandra-williams): Approved for Curricular Services Review
3. 02/21/18 10:22 am
   Roxanna Russell (rrussell): Approved for GE Committee Prepener UG
4. 03/01/18 10:44 am
   Christian Brannstrom (cbrannst): Approved for GE Committee Chair UG
5. 03/01/18 10:49 am
   Christian Brannstrom (cbrannst): Approved for GE College Dean UG
6. 03/05/18 9:06 am
   Sandra Williams (sandra-williams): Approved for UCC Preparer
7. 03/09/18 3:30 pm
   Sandra Williams (sandra-williams): Approved for UCC Chair

https://nextcatalog.tamu.edu/courseleaf/approve/
concurrent enrollment be enforced? Crosslistings No Crosslisted With No

Stacked No Stacked with

<table>
<thead>
<tr>
<th>Semester</th>
<th>3</th>
<th>Contact Hour(s)</th>
<th>Lecture: 3</th>
<th>Lab: 0</th>
<th>Other: 0</th>
<th>Total: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit</td>
<td>3</td>
<td>(per week):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Repeatable for credit? No
Three-peat? No
CIP/Fund Code 4004010002
Default Grade Mode Letter Grade(G)
Alternate Grade Modes Satisfactory/Unsatisfactory
Method of instruction Lecture
Will sections of this course be taught as non-traditional? (i.e., parts of term, distance education) Yes

Learning Outcomes

Meets traditional face-to-face learning outcomes.

Describe how learning outcomes are met or provide justification why they are not met.

Learning outcomes are same as in traditional classroom settings, and evaluated via similar method (e.g., student work products).

Hours

Meets traditional face-to-face hours.

Describe how hours are met or provide justification why they are not met.

The total number of course hours involved in academic engagement are the same as in a traditional setting. Verified by College of Geosciences worksheet for nontraditional courses.

Will this course be taught as a distance education course? Yes No

I verify that I have reviewed the FAQ for Export Control Basics for Distance Education. Yes No

Is 100% of this course going to be taught in Texas? Yes

Will classroom space be needed for this course? Yes

This will be a required course or an elective course for the following programs:

<table>
<thead>
<tr>
<th>Required (select program)</th>
<th>Program(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(BS-METR) Meteorology - BS</td>
<td></td>
</tr>
</tbody>
</table>
core curriculum consideration?

Proposed Core
Foundation
Component Area

Approved Foundational
Component Area
Core Life/Physical Sci (KLPS)

Has/will this course be(en) submitted for Writing or Communication consideration?

Has/will this course be(en) submitted for ICD consideration?

No

Course Syllabus

Syllabus:
Upload syllabus

Upload syllabus
atmo201_traditional_syllabus.pdf
atmo201_online_syllabus.pdf
atmo201_nontrad_checklist.pdf

Letters of support or other documentation
No

Additional information
We plan to continue offering most ATMO 201 sections as traditional face-to-face on campus courses, but wish to continue to offer some sections online; I am submitting this form with a traditional face-to-face syllabus, a copy of the online version’s syllabus, and a copy of the College of Geosciences nontraditional course equivalency checklist used to verify that nontraditional courses meet same instructional, syllabus, and credit requirements.

Reviewer Comments
Sandra Williams (sandra-williams) (11/14/17 7:27 pm): Rollback: As indicated on the form, please attach a nontraditional syllabus and a traditional syllabus to your request.
Sandra Williams (sandra-williams) (03/09/18 3:29 pm): UCC approved March 9 via e-vote.

Reported to state?

No
Description: ATMO 201 is a broad introductory survey course in the atmospheric sciences, with course topics ranging from cloud processes to weather and climate change. Some major themes of the course include:

- **Thermodynamics**: Composition, energy inputs and structure of the atmosphere
- **Cloud processes**: Stability, cloud formation and precipitation processes
- **Pressure and winds**: Forces, Newton’s second law and atmospheric motions
- **Weather phenomena**: Cyclones, fronts and weather forecasting
- **Severe weather**: Hurricanes, thunderstorms, tornados
- **Global processes**: Planetary circulation patterns and the dynamics of climate

By the end of the course you should have a deeper appreciation and understanding of weather and climate phenomena, and be able to apply this understanding to your everyday experience.

Prerequisites: Basic understanding of high-school math and science

Grading: Grades will be based on

- (a) Two in-semester exams (24 points each)
- (b) Three short quizzes (12 points each)
- (c) A quasi-comprehensive final exam (28 points)

For the quizzes, only the top two scores will count toward the final grade. The total for the class is then 100 points (2x24 + 2x12 + 28 = 100 points). The final course grades will follow the standard scale:

- A: 90 or above; B: 80–90; C: 70–80; D: 60–70; F: 59 or below

I reserve the option to adjust these grade cutoffs downward slightly to achieve a fairer grade distribution.

Anticipated Exam and Quiz Dates (possibly subject to change):

- In-semester exams: 7/17 and 7/27
- Final exam: 8/8
- Quizzes: 7/11, 7/21 and 8/2

Make-up Policy: Students who miss an exam or quiz for an unexcused absence (as defined by Student Rule 7, see http://student-rules.tamu.edu/rule07) will be allowed to take a make-up exam or quiz, but with a 40% penalty applied. For further details, and expectations about attendance, see Attendance Policy below.
The required text for the course is

*Extreme Weather and Climate*, by Ahrens and Samson

**Course topics:**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (7/5)</td>
<td>Introduction; composition and structure</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Pressure, density, temperature; saturation states</td>
<td>1</td>
</tr>
<tr>
<td>2 (7/10)</td>
<td>Radiation and the greenhouse effect; heat transfer</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>The seasons and daily temperatures; energy balances</td>
<td>2-3</td>
</tr>
<tr>
<td></td>
<td>Vertical motions and clouds; pressure charts</td>
<td>3, 7</td>
</tr>
<tr>
<td>3 (7/17)</td>
<td>Layer thickness; pressure forces and Coriolis</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Laws of motion; geostrophic balance</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>The global circulation; jet streams</td>
<td>8</td>
</tr>
<tr>
<td>4 (7/24)</td>
<td>Fronts and cyclones</td>
<td>9-10</td>
</tr>
<tr>
<td></td>
<td>The Norwegian cyclone model</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Fog and cloud types; stability classes</td>
<td>4-5</td>
</tr>
<tr>
<td>5 (7/31)</td>
<td>Stability and clouds</td>
<td>5, 11</td>
</tr>
<tr>
<td></td>
<td>Thunderstorms, supercells and tornadoes; hurricanes; hurricanes</td>
<td>12-13</td>
</tr>
<tr>
<td></td>
<td>Climate</td>
<td>15</td>
</tr>
</tbody>
</table>

Specific readings will be assigned on the course website. The schedule above is approximate and subject to change—see the course website for up-to-date information.

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**Core Requirements and Learning Outcomes**

As part of the Life and Physical Sciences component area of the University Core Curriculum, ATMO 201 addresses the following general learning objectives:

(a) **Critical thinking skills:** Creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.

(b) **Empirical and quantitative skills:** The manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

(c) **Communication skills:** Effective development, interpretation and expression of ideas through written, oral and visual communication.

(d) **Teamwork:** The ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

**Expected Learning Outcomes**

By the end of the course, students will be expected to be able to (with letters corresponding to the general Core Curriculum objectives above):

**Composition and Structure**

- Describe the composition of the atmosphere, and some of the thermodynamic and biological impacts of various chemical constituents *(a)*
Infer the distributions of pressure and temperature in the atmosphere, and explain the relationship between pressure and the distribution of mass \((a,b)\)

Explain the concepts of saturation and humidity, and describe the effects of evaporation and condensation in the atmosphere \((a,b)\)

**Energy and Thermodynamics**

- Describe how energy moves through the Earth / atmosphere system, in the forms of radiation, heat transfer, and latent heat \((a)\)
- Explain the atmospheric greenhouse effect, in terms of the selective absorption and emission of radiation \((a,c)\)
- Infer the daily and seasonal cycles of temperature at the ground \((a,b)\)

**Forces and Circulations**

- Describe the forces at work on atmospheric air masses, and how these forces result in winds and circulations \((a,b)\)
- Explain the presence of the upper-tropospheric jet streams, and their relation to the global temperature distribution \((a)\)
- Describe global circulation patterns and their effects on rainfall and regional climate \((a)\)

**Weather Systems**

- Read and interpret weather data, including surface maps, upper-level charts, and radar and satellite images \((a,b,c)\)
- Describe the properties of cold and warm fronts, as well as their associated weather impacts \((a,b)\)
- Explain the formation and life cycle of mid-latitude low-pressure systems, as well as analyze the evolution of such systems on a weather map \((a,b,c)\)
- Make simple short-term predictions based on current weather conditions \((a,b)\)

**Clouds and Severe Storms**

- Explain the concept of atmospheric stability, and its role in determining cloud types on any given day \((a,b)\)
- Describe the formation, basic structure, and classification of thunderstorms and mesoscale convective systems \((a)\)
- Identify basic weather conditions leading to severe and tornadic thunderstorms \((a,c)\)
- Describe the structure, evolution and impacts of hurricanes, and identify conditions under which hurricanes typically form \((a)\)

**Climate Processes**

- Describe the past climate of the Earth over various time scales, as inferred from the geological record and other sources \((a)\)
- Identify the forcings behind past climate oscillations, including plate tectonics, orbital / tilt effects, and changes in atmospheric composition \((a,b)\)
- Explain various feedbacks and amplifications in the climate system \((a)\)
- Comment intelligently about climate models, climate predictions and global change \((a,c)\)

**Other Outcomes**

- Describe and assess weather impacts from a societal and economic perspective \((a,b)\)
- Develop and present a concise and engaging presentation on a technical topic, highlighting key concepts and ideas \((a,c)\)
- Work with a group of peers to collectively complete an assignment or project \((d)\)
- Interpret data presented in a variety of formats, including contour maps and charts, spectra
and distribution curves, vertical profile plots, 3D isosurfaces, etc. \((a,b,c)\)

**Academic Integrity:** “An Aggie does not lie, cheat, or steal, or tolerate those who do.” Violations of the Aggie Honor Code degrade your education and devalue the Texas A&M degree, both for present and future graduates. In keeping with University Regulations, all violations will be reported to the Aggie Honor System Office. A first offense will not be treated as grounds for leniency. Please inform yourself about the Aggie Honor Code at [http://aggiehonor.tamu.edu](http://aggiehonor.tamu.edu).

**Copyright Policy:** All materials used in this class are copyrighted. These materials include, but are not limited to, syllabi, lectures, notes, exams, review sheets and additional assignments. Because these materials are copyrighted, you do not have the right to copy them unless permission is expressly granted.

**ADA Policy Statement:** 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 contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit [http://disability.tamu.edu](http://disability.tamu.edu).

**Attendance Policy**

Attendance at lectures is expected but will not be explicitly monitored or graded. As outlined by Student Rule 7 (see [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07)), the university views class attendance as an individual student responsibility. Students are expected to be aware of all assignments and deadlines as if they attended class, regardless of actual attendance.

Students missing an exam or quiz for an excused absence will be granted an opportunity to take a make-up exam or quiz. (For a list of approved absences, see Student Rule 7. Other absences may be excused as well at the discretion of the instructor, with appropriate notification and documentation.) Whenever possible, students are expected to provide notice and documentation for any excused absence at least three days before the exam or quiz. In cases where prior notification is not feasible (e.g., an accident or emergency), the student must provide notification by the end of the second working day after the absence, including an explanation of why notice could not be sent prior to class.

Students are expected to complete any make-up work within one week of the missed exam or quiz, unless otherwise agreed upon by the instructor. Failure to notify and/or document an absence properly may result in an unexcused absence. Be aware that falsification of documentation is a violation of the Honor Code.

As described above (under *Make-up Policy*), students missing an exam or quiz for an unexcused absence (or without proper notification or documentation) will be allowed to take a make-up exam or quiz, subject to the penalty described previously.

For further details on attendance, including proper notification for absences, refer to Student Rule 7 ([http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07)).
Note: Please read University Rule 11.03.99.M1 before completing this checklist.

College of Geosciences
Nontraditional Course Equivalency Checklist

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Course Number</th>
<th>Instructor</th>
<th>Department</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weather &amp; Climate</td>
<td>ATMO 201</td>
<td>Craig Epifanio</td>
<td>ATMO</td>
<td>Summer 2018</td>
</tr>
</tbody>
</table>

The standards contained in the checklist below will be utilized in developing and scheduling all nontraditional courses.

Faculty/Course Developer/Date: 1/25/18
Department Head/Date: 1/23/18

COURSE SYLLABUS REQUIREMENTS

Course Overview
☐ A statement introduces the student to the purpose of the course and its components.
☐ Instructor contact information is clear.
☐ Communication policy is clearly stated such as email response time and virtual office hours.

Learning Objectives
☐ The course learning objectives describe outcomes that are measurable.
☐ All learning objectives are stated clearly and written from the students' perspective.
☐ The course is developed in modules with stated learning objectives for each module.

Assessment and Grading
☐ The grading policy is clearly stated.
☐ Assessments measure the stated learning objectives.
☐ Clear instructions are provided for the evaluation of work and are tied to the grading policy.

Instructional Materials
☐ Required instructional materials are listed and coordinated with the bookstore or other sources.
☐ Instructional materials are current and contribute to the achievement of learning objectives.
☐ A variety of instructional materials are used in the course.

Learner Engagement
☐ Learner engagement and preparation have been calculated in the attached worksheet.
☐ Learning activities promote achievement of learning objectives and foster student-instructor, student-content, and where appropriate, student-student interaction.
☐ Interaction, communication, timelines for feedback, and participation requirements are clearly articulated.
☐ Tools and media used support learning objectives and learner engagement.

Technology and Accessibility
☐ Student identity is verified via CAS Authentication.
☐ Technical requirements are clearly stated.
☐ Technologies in the course are readily obtainable.
☐ The course incorporates ADA standards and reflects conformance with institutional policy regarding accessibility in online and blended courses.

Learner Support
☐ Instructions articulate or link to a clear description of the technical support offered.
☐ Additional instructions are included if needed that answer questions related to research, writing, technology, etc. or link to other tutorials/resources that provide the information.
Academic Engagement/Credit Hour Calculation Worksheet

Student work includes direct or indirect faculty instruction. Academic engagement may include, but is not limited to, submitting an academic assignment, listening to class lectures or webinars (synchronous or asynchronous), taking an exam, completing an interactive tutorial or computer-assisted instruction, attending an online study group, contributing to an online discussion, initiating contact with a faculty member to ask a question about the academic subject studied in the course, conducting laboratory work, and completing an externship or internship.

Preparation: homework, such as reading and study time, and completing assignments and projects. Therefore, a 3 credit hour course would require 135 semester hours (45 hours of academic engagement and 90 hours of preparation).

Use this section to break down the total points available in this course

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Discussions</td>
<td>--</td>
</tr>
<tr>
<td>Quizzes (2 @ 12 points each)</td>
<td>24</td>
</tr>
<tr>
<td>Group Project</td>
<td>--</td>
</tr>
<tr>
<td>Mid-term (2 @ 24 points each)</td>
<td>48</td>
</tr>
<tr>
<td>Final Exam</td>
<td>28</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Use this section to document learner engagement and preparation time:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Assignments</th>
<th>Estimated hours for the average student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Engagement</td>
<td>Listening to or reading course lectures: 25 pages per hour (1 per week)</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Reading additional website documents: 25 pages per hour (.5 per week)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Audio and video: 22 pages per hour (1/2 hour per week)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Reading discussion forums and making responses: 1 hour per week</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Presenting and reading student reports: 1 hour per week</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Taking quizzes and exams: .5 hours per week</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL: should be at least 45 hours per semester</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Preparation (outside of class)</th>
<th>Assignments</th>
<th>Estimated hours for the average student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required textbooks, ordinary reading level: 30 pages per hour</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Required textbooks, difficult reading level: 25 pages per hour</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Reaction/reflection papers and book reports: 1 hours per page</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Case studies: 1 hour per page</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Research papers: 3 hours per page</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Study for quizzes and exams:</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Project, journaling, or other assignments:</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL: should be at least 90 hours per semester</strong></td>
<td><strong>90</strong></td>
<td></td>
</tr>
</tbody>
</table>

| Overall Total | Should be at least 135 hours for a 3 credit course per semester | 135 |