Life and Physical Sciences
Texas A&M University
Core Curriculum

Initial Request for a lower division course included in the current Core Curriculum
to be considered for the Fall 2014 Core Curriculum

1. This request is submitted by (department name): Ecosystem Science and Mgmt

2. Course prefix and number: ESSM 309

3. Texas Common Course Number: none


5. Semester credit hours: 3

6. This request is for consideration in the following Foundational Component Area:
   [ ] Communication
   [ ] Mathematics
   [x] Life and Physical Sciences
   [ ] Language, Philosophy and Culture
   [ ] Creative Arts
   [ ] American History
   [ ] Government/Political Science
   [ ] Social and Behavioral Sciences

   Current Core - yes

7. This course should also be considered for International and Cultural Diversity (ICD) designation:
   [ ] Yes
   [x] No

8. How frequently will the class be offered? Fall

9. Number of class sections per semester: 1

10. Number of students per semester: 38-78

11. Historic annual enrollment for the last three years:
    prev. FRSC 304  prev. FRSC 304
    2010-48       2011-78
    2012-38

   This completed form must be attached to a course syllabus that sufficiently and specifically details the appropriate core objectives through multiple lectures, outside activities, assignments, etc. Representative from department submitting request should be in attendance when considered by the Core Curriculum Council.

13. Submitted by: [Signature] 4/22/13

   Course Instructor

   Approvals:

   [Signature] 4/24/13

   Department Head

   [Signature] 4/25/2013

   College Dean/Designee

For additional information regarding core curriculum, visit the Texas Higher Education Coordinating Board website at www.thecb.state.tx.us/corecurriculum2014

See form instructions for submission/approval process.

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Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

Foundational Component Area: Life and Physical Sciences

In the box below, describe how this course meets the Foundational Component Area description for Life and Physical Sciences. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

How does the proposed course specifically address the Foundational Component Area definition above?

Students in ESSM 309 (Forest Ecology) are shown how the scientific method is used by scientists to address the issues facing forest ecosystems throughout the world. In the beginning of the course, we discuss inductive vs. deductive scientific reasoning and how ecology is often relying on an inductive scientific approach to test hypotheses. We discuss how this scientific approach is a natural extension of dealing with open systems. This discussion serves as the basis for future lessons on ecological systems as a manifestation of the interaction between biotic and abiotic components of the ecosystem and how this interaction can be shaped by stochastic events and evolutionary change.

Core Objectives

Describe how the proposed course develops the required core objectives below by indicating how each learning objective will be addressed, what specific strategies will be used for each objective and how student learning of each objective will be evaluated.

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

Students are asked to construct a presentation on a particular threat or positive benefit to a forested ecosystem with the material derived from the scientific literature. They pose a hypothetical issue facing this forest type (climate change), make a prediction on how some aspect of the forest’s function will change, and then describe the things that will be monitored to test their hypothesis.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):

-Online discussion of assigned reading material
-Problem presentation during class with associated writing assignment

Written communication: In the online discussion, students provide written original interpretations of assigned reading material, relate information from the larger world, pose questions to the instructor or larger group, or comment on the interpretation(s) of others. In addition, the students will each write a report on their topic selected as a ‘problem presentation’ with individuals within a group providing a different emphasis on one part of the overall topic.

Assessment: Instructor provides a grade (1-5) for the quality of the online discussion. Discussion topics are posted weekly. The written reports on an ‘ecological problem’ are graded by the instructor and by another student (randomly assigned) in the class. Reports are graded based on the effectiveness of the problem statement, description of the ecosystem, clarity in writing and overall style.

Visual Presentation and oral communication: Students are asked to present, as a group of 2-3, their ecosystem and associated problem during class as a powerpoint presentation. These are graded by another group and by
Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

the instructor using a scoring rubric. Active listening is encouraged by the instructor and subjectively assessed. Students other than the ‘gracers’ who are viewing another presentation are encouraged to participate and ask questions.

Assessment: Students are graded on the oral presentation’s clarity and content, the use of graphs and scientific information in the presentation, and to a lesser degree individual presentation style (pacing, eye contact, adherence to time constraints). Another group that is assigned to grade the presenting group is given a grade to ensure they turn in their assessment forms. They are also specifically encouraged to engage the group they are grading in the form of questions.

Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

Primary literature graphics are needed in their presentation and need to be presented as forming the basis for either the opportunity or problem (or the solution) facing their forested ecosystem. Quantitative work is primarily restricted to exams, where the students are expected to estimate residence times and turnover rates of different elements in forested ecosystems.

Teamwork (to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal):

Both the group presentation and the writing assignment are meant to have the students interact with one another and discuss the assignments. In addition weekly online discussion assignment are used to have the students discuss the material in the book with peers beyond those in their immediate group for the presentation assignment.

Please be aware that instructors should be prepared to submit samples/examples of student work as part of the future course recertification process.
Course title and number  Forest Ecology, ESSF 309
Term  Fall 2012
Meeting times and location  Class: Tuesday, Thursday, 2:20 – 3:35 PM

Instructor Information
Name  Jason G. Vogel
Telephone number  979 445 5580
Email address  jason_vogel@tamu.edu
Office hours  Open door or by appointment
Office location  Room 209C Animal Sciences

Prerequisites
Introductory courses in ecology and chemistry are recommended but not required.

Instructor
Dr. Jason G. Vogel
Office: 207 Animal Industries
Phone: 845-5580
Email: jason_vogel@tamu.edu
Website: http://essm.tamu.edu/people/vogel/

Course Description
This course will introduce students to ecology with a special focus on forest ecosystems. Students will learn the life history and general characteristics of trees; structure and function of forest ecosystems; fundamental principles of forest tree physiology and ecology applied to an analysis of tree growth in relation to environmental factors and present day forest management; global change and forests.

Course learning objectives
Upon completion of this course you will be able to:
- Describe the key interrelationships among plants, animals, micro-organisms and their environments in forest ecosystems.
- Describe the structure and function of trees and forests and the ecosystem services they provide.
- Evaluate the impacts of environmental change, including climate change and human impacts on forest ecosystems in an earth system context.
- Synthesize, interpret, and communicate science-based information on forest ecosystems and management.

Format
Forest Ecology 309 is a 3-credit lecture course. We will explore basic concepts and current topics in forest ecology through assigned readings, student presentations and writing assignments, classroom discussion, lectures, and in-class activities.
Office hours
I can meet on Tuesday and Thursday after class from 3:45-4:45 PM in HECC. In addition, please feel free to send me emails with questions, comments, or to arrange a meeting in person at my Animal Industries office. I will typically reply to email within 24 hours.

Web-based course materials
A companion website for the course is located in eLearning (Blackboard Vista). As a registered student, you will have access to the website. The website is an essential course tool.

1. You can access eLearing through the TAMU Howdy website or through following URL: http://elearning.tamu.edu/
2. Click on the "TAMU" link
3. Login using your official TAMU user name and password. Click on “OK”.
4. Complete your discussion assignments

Textbook

Other recommended books

Major course activities, assignments, and projects

1) Required readings from the textbook
You will be expected to read assigned material (from the course textbook) before each class period and participate in discussions, lectures, and activities. To excel in this course, your attendance at all class sessions is expected and will help you progress in your study throughout the semester. The lectures and class activities will typically focus on the same topics you have read about, but may address different materials, depending on the importance of the reading, its difficulty, and the information that needs to be covered. In addition to the chapter assignments, supplemental readings may be assigned for some topics. These readings will be posted on the course website.

2) Online discussion questions or comments and classroom discussion
For each assigned reading throughout the course, you will have the opportunity to post a question or comment based on the assigned reading for the day or on relevant related topics. These daily questions or comments should be brief (1-3 sentences in length), and posted online on the course website. Postings are due prior to the beginning of class. Late postings (after 2:20 pm on the due date shown) will not receive credit. Feel free to join existing discussion threads, respond to questions or comments posted or start one of your own. You may post more than once. We will address a select sampling of your questions in class discussions as time permits at the beginning of each class session.

Why are the online questions or comments important?
The objectives of these required "daily questions" are to:
• Assist you in organizing and studying the course material
- Enhance your online and classroom experience
- Practice critical thinking and evaluation
- Provide valuable feedback on your level of understanding
- Move classroom focus to issues you find interesting and important
- Create interaction among you and your classmates

In addition, I will post online replies to your questions. Please visit the discussion post area to read the posted discussion questions and responses. This often proves to be a helpful study aid.

What types of questions or comments are you looking for?
A good question indicates some depth of thought. A question could be something specific that you don't understand (e.g., "what is soil nitrogen mineralization and its role in forest ecosystems?"), or that seems to contradict something else we've read or covered in lecture (e.g., "how can we reconcile these results with those of Sarah Smith who found opposite results in Siberia?"). Comments could for instance, indicate what you think is an important policy implication or linkage to other aspects of forest ecology. In addition, you can suggest interesting internet links to your classmates.

How will the online discussion questions be evaluated?
Questions or comments will be evaluated based on clarity, quality, relevance, and mechanics (grammar, spelling). A good question or comment indicates depth of thought and evidence of critical thinking. **Questions will be individually graded on a four-point scale** (5=excellent, 4=good, 3=average, 2=below average, 1=unacceptable)
Unexcused late submissions will not be accepted. There are a total of 12 posting assignments. For full credit, you are required to complete 10 postings. This means you may elect for any reason not to complete two daily question postings without penalty. If you complete all the daily question postings, the extra points you earn (maximum of 10 points) will be included as extra credit and added to your course total points.

3) Quizzes
Two online quizzes will be made available two class periods before a mid-term exam. These will consist of matching for vocabulary and multiple-choice and are designed to have you review your notes before the midterm. You can do these on your own time and you will have 48 hours to complete the quiz.

4) Midterm exams——GREY SCANTRON SCORE SHEETS ARE NEEDED
There will be two in-class midterm exams. These exams will largely cover the material presented since the last exam; however, this course builds on basic principles that are revisited and so exams are cumulative. The exam format will include vocabulary matching and multiple-choice.

5) Oral Presentation and Writing assignment
Student groups of 2-4 will pick a topic related to forest ecosystem threats, potential change, or previous change and give a presentation on this topic. Possible topics will be provided during class, but students can choose their own with instructors permission. Each presentation will include background on the ecosystem, problem statement, a hypothesis based on the issue at hand, proposed monitoring efforts, and how these methods relate to the hypothesis. Each group member will write a 1-2-page summary of their ecosystem that follows these sections with the last paragraph dedicated to how each student contributed to the project.

6) Final exam——GREY SCANTRON SCORE SHEETS ARE NEEDED
There will be an *optional* in-class final exam. This exam can only improve your final grade; Meaning if it is lowers your course score it will not count. The Texas A&M University Registrar has scheduled the final examination on **Wednesday, December 12, 2012 from 1 to 3 p.m.** The final exam will be weighted towards course content covered subsequent to the second exam. Nonetheless, the final examination is comprehensive and will include questions that cover concepts learned throughout the course.
7) Extra Credit
Extra credit will only be assigned to the entire class (see “Postings” assignment). A onetime 5-point extra credit is also available to everyone who attends an ecology or biology themed seminar on campus and writes a short report. The report is due within 48 hours of the lecture that you attended. Late submissions will not be accepted. These will either be announced by me in class or you can suggest a lecture to me for approval. Individuals will not be assigned extra credit beyond what is available to everyone.

Evaluation and final grade

<table>
<thead>
<tr>
<th>Course assignment</th>
<th>Possible Points</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Discussion postings (1)</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>Quiz 1</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>Exam 1 ~ midterm</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>Quiz 2</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>Exam 2 ~ midterm</td>
<td>100</td>
<td>20</td>
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<tr>
<td>Quiz 3</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td>Oral presentation</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>Writing assignment</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>Final exam</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td><strong>Course total</strong></td>
<td><strong>500</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

\(1\) Ten postings must be completed out of 12 possible posting assignments. You may complete two extra postings for a 10-points extra credit. These points will be added to the course total.

Course point totals and letter grade. These are accurate if final exam is left in grade.

<table>
<thead>
<tr>
<th>Total points</th>
<th>Percentage</th>
<th>Course letter grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>450 - 500</td>
<td>≥ 90</td>
<td>A</td>
</tr>
<tr>
<td>400 - 449</td>
<td>≥ 80</td>
<td>B</td>
</tr>
<tr>
<td>350 - 399</td>
<td>≥ 70</td>
<td>C</td>
</tr>
<tr>
<td>300 - 349</td>
<td>≥ 60</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 299</td>
<td>&lt; 60</td>
<td>F</td>
</tr>
</tbody>
</table>

Course policies

*Classroom environment.* Please silence cell phones, pagers, and other electronic devices before class. Laptops are permitted for taking notes. Please respect your classmates by arriving on time, remaining the entire class period, and refraining from eating, drinking, or sleeping during class. As a courtesy, please let me know prior to the beginning of class if you must leave while class is in session.

*Late assignments.* No credit is given for late assignments. Late assignments will accepted only for university-authorized excused absences. Please contact your instructor prior, (if possible) to the assignment due date. No points will be recorded for online discussion entries posted after 2:20 P.M. on the due date.

*Missed quizzes and exams.* Make-up exams and quizzes are not permitted except for extenuating circumstances (e.g., illness, injury, or other emergency) that include both prompt written notification (acknowledged e-mail message is acceptable) and proper proof to document the reason for missing the exam. If you are not able to take the exam, please contact your instructor prior to the scheduled exam time. In cases where advance notification is not feasible (e.g., accident, or emergency) you must provide written notification (acknowledged email is acceptable) by the end (5 P.M.) of the second day after the absence (within 48 hours). This notification should include an explanation of why notice could not be sent prior to the class. Late notifications (after 48 hours) are not accepted and a grade of 0 will be recorded. If
needed, the student must provide additional documentation substantiating the reason for the absence that is satisfactory to the instructor, within one week of the last date of the absence.

**Final exam.** The University Registrar has scheduled the final exam for this course on Wednesday, December 12, 20:2 from 1 to 3 p.m. The final exam is optional and can only improve your grade. According to University rules, the final examination must conform to this date, time, and place. Thus, requests for alternative final examination arrangements cannot be accepted. The exam begins at 1:00 pm and will end promptly at 3:00 pm. Late arrival may preclude one from taking the final exam. Anyone arriving after the first student has left the final examination room will not be permitted to take the final exam.

**Excused absences.** Students who are requesting an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for an absence that results in a missed exam or assignment. Injury or illness is among the reasons absences are considered excused by University policy. A medical confirmation note must contain the date and time of the illness and medical professional's confirmation of needed absence. An absence for a non-acute medical service does not constitute an excused absence (from Student Rules at [http://student-rules.tamu.edu/](http://student-rules.tamu.edu/)). If the absence is excused, you will be provided with an opportunity to make up any quiz, exam or other graded activities or be provided a satisfactory alternative to be completed as soon as possible, but no later than 30 calendar days from the last day of the absence.

**Appeals.** Appeals for reevaluation of any assignment or exam will be accepted in writing. You are granted until 5 P.M. on the second full working day following the return of an exam to present your case. Your argument must be a written statement concerning why you think a particular answer was correct or did not receive the credit it deserved.

**Course incompletes.** The University regulations are: "The instructor shall give this grade only when the deficiency is due to an authorized absence or other cause beyond the control of the student."

**Promoting academic integrity**

"An Aggie does not lie, cheat or steal or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System. For additional information please visit: [http://www.tamu.edu/aggiehonor/](http://www.tamu.edu/aggiehonor/).

Texas A&M University expects academic integrity and strictly enforces policies against any form of scholastic dishonesty. Please review the Student Rules for more information. The usual penalty for an initial violation shall be an "F*" in the course and "Honor Violation Probation". Depending upon the facts of the case and the nature of the honor code violation and whether or not a repeat offender, additional sanctions may be imposed. Sanctions may include suspension and expulsion from the University.

In Forest Ecology 309, cheating or complicity in cheating on an exam, or fraudulent requests for excused absences assignment among other forms of academic dishonesty will result in an "F" in the course and "Honor Violation Probation". If circumstances warrant, a lesser penalty consisting of grade of 0 on the work in question will apply. A grade of 0 on the work in question is the minimum penalty in this course.

The Texas A&M University Student Rules and Honor System define several forms of academic dishonesty, these include, but are not limited to:

1. **Cheating:** Intentionally using or attempting to use unauthorized materials, information, notes, study aids or other devices or materials in any academic exercise. Cheating also includes unauthorized copying or removal of an exam (in whole or in part) from the examination room.
2. Fabrication: Making up data or results, and recording or reporting them; submitting fabricated documents. This also includes material (email, documents) to support an excused absence.

3. Falsification: Manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record. This also includes material (email, documents) to support an excused absence.

4. Multiple Submissions: Submitting substantial portions of the same work (including extra credit reports) for credit more than once without authorization from the instructor of the class for which the student submits the work.

5. Plagiarism: The appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

6. Complicity: Intentionally or knowingly helping, or attempting to help, another to commit an act of academic dishonesty.

Americans with Disabilities Act (ADA)
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 the Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu
# ESSM 309 FOREST ECOLOGY

## Fall 2012 Class Schedule

**Tuesday, Thursday, 2:20 – 3:35 PM**  
**Harrington Education Center Classroom Building, Room 200 (HECC 200)**

### Schedule of Topics and Assignments

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Lecture or activity¹</th>
<th>Chapter reading list²/³ (Discussion posting due before class)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug 28</td>
<td>Introduction to forest ecology</td>
<td>Ch. 1</td>
</tr>
<tr>
<td>2</td>
<td>Sep 4</td>
<td>Landscape variation in ecosystems</td>
<td>Ch. 2 (posting 1)</td>
</tr>
<tr>
<td></td>
<td>Sep 6</td>
<td>Film 'Forests'</td>
<td>Ch. 4 (posting 2)</td>
</tr>
<tr>
<td>3</td>
<td>Sep 11</td>
<td>Change in Time</td>
<td>Ch. 6 (posting 3)</td>
</tr>
<tr>
<td>4</td>
<td>Sep 13</td>
<td>Disturbance in Ecosystems</td>
<td>Ch. 7 (posting 4)</td>
</tr>
<tr>
<td>5</td>
<td>Sep 18</td>
<td>Disturbance in Ecosystems</td>
<td>Ch. 8 (posting 5)</td>
</tr>
<tr>
<td></td>
<td>Oct 20</td>
<td>Succession/Online Quiz Available</td>
<td>Ch. 12</td>
</tr>
<tr>
<td></td>
<td>Oct 25</td>
<td>New Session</td>
<td>--</td>
</tr>
<tr>
<td>6</td>
<td>Oct 27</td>
<td>Exam 1 (midterm)³</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>Nov 4</td>
<td>Structure of Local Ecosystems</td>
<td>Ch. 9</td>
</tr>
<tr>
<td></td>
<td>Nov 9</td>
<td>Biodiversity</td>
<td>Ch. 10 (posting 6)</td>
</tr>
<tr>
<td>8</td>
<td>Nov 11</td>
<td>Genetic and Evolutionary Aspects of species interaction</td>
<td>Ch. 11 (posting 7)</td>
</tr>
<tr>
<td>9</td>
<td>Nov 16</td>
<td>Soil/Online Quiz Available</td>
<td>Ch. 13</td>
</tr>
<tr>
<td></td>
<td>Nov 18</td>
<td>Primary Productivity / Review Session</td>
<td>Ch. 14 (posting 8)</td>
</tr>
<tr>
<td></td>
<td>Nov 25</td>
<td>Exam 2 (midterm)</td>
<td>Ch. 15 (posting 9)</td>
</tr>
<tr>
<td>10</td>
<td>Dec 30</td>
<td>Forest Nutrition</td>
<td>Ch. 16 (posting 10)</td>
</tr>
<tr>
<td>11</td>
<td>Nov 1</td>
<td>Systems Thinking /Biogeochemical Cycling</td>
<td>Ch. 17</td>
</tr>
<tr>
<td>12</td>
<td>Dec 6</td>
<td>Student Presentations</td>
<td>--</td>
</tr>
<tr>
<td>13</td>
<td>Dec 13</td>
<td>Student Presentations</td>
<td>--</td>
</tr>
<tr>
<td>14</td>
<td>Dec 15</td>
<td>Herbivores in Forest Ecosystems</td>
<td>Ch. 18</td>
</tr>
<tr>
<td>15</td>
<td>Dec 20</td>
<td>Ecosystem Stability</td>
<td>Ch. 20 (posting 12)</td>
</tr>
<tr>
<td>16</td>
<td>Dec 22</td>
<td>Thanksgiving – no class</td>
<td>--</td>
</tr>
<tr>
<td>17</td>
<td>Dec 27</td>
<td>The Future</td>
<td>Ch. 23</td>
</tr>
<tr>
<td>18</td>
<td>Dec 29</td>
<td>The Future</td>
<td>Ch. 23</td>
</tr>
</tbody>
</table>

¹Lecture order may vary slightly from the schedule described above

²Readings and discussion question postings are due prior to lecture on the date shown. The chapter assignments are found in: Perry, D.A., Oren, R., Hart S.C. 2008. *Forest Ecosystems*. 2nd edition. The Johns Hopkins University Press, Baltimore, Maryland, 606pp. Additional brief supplemental readings may also be assigned for some topics.

³I will be attending professional meetings on these dates.
Texas A&M University
Core Curriculum

Initial Request for a lower division course included in the current Core Curriculum
to be considered for the Fall 2014 Core Curriculum

1. This request is submitted by (department name): Ecosystem Science and Mgmt, Wildlife and Fisheries Science

2. Course prefix and number: RENR 215

3. Texas Common Course Number: none


5. Semester credit hours: 1

6. This request is for consideration in the following Foundational Component Area:

- [ ] Communication
- [ ] Mathematics
- [X] Life and Physical Sciences
- [ ] Language, Philosophy and Culture
- [ ] Creative Arts
- [ ] American History
- [ ] Government/Political Science
- [ ] Social and Behavioral Sciences

Current Core: Yes

7. This course should also be considered for International and Cultural Diversity (ICD) designation:

- [ ] Yes
- [X] No

8. How frequently will the class be offered? Fall and Spring

9. Number of class sections per semester: 14

10. Number of students per semester: max of 196, 14 per section

11. Historic annual enrollment for the last three years:

   - 2010 - 376
   - 2011 - 390
   - 2012 - 381

This completed form must be attached to a course syllabus that sufficiently and specifically details the appropriate core objectives through multiple lectures, outside activities, assignments, etc. Representative from department

subsequent request should be in attendance when considered by the Core Curriculum Council.

13. Submitted by:

   [Signature]

   Course Instructor

   [Signature]

   Approvals

14. Department Head

   [Signature]

   Date 2/6/13

15. College Dean/Designee

   [Signature]

   Date

For additional information regarding core curriculum, visit the Texas Higher Education Coordinating Board website at www.thecb.state.tx.us/corecurriculum2014

See form instructions for submission/approval process.
Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

Foundational Component Area: Life and Physical Sciences

In the box below, describe how this course meets the Foundational Component Area description for Life and Physical Sciences. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

How does the proposed course specifically address the Foundational Component Area definition above?

The objective of RENR 215 is to introduce students to the general principles, methods, and equipment for field-based investigation of the biotic and abiotic components of an ecosystem and their interactions, specifically: (1) Introduce the design and procedure of field ecological investigation, data analysis and report writing for quantitative description of ecosystems consisting of biological communities (interacting plant, animal and microbial populations) and their abiotic environment. (2) Acquaint students with the variety of ecosystems found in Texas, as well as a variety of species and some of their special adaptations to their environments.

Core Objectives

Describe how the proposed course develops the required core objectives below by indicating how each learning objective will be addressed, what specific strategies will be used for each objective and how student learning of each objective will be evaluated.

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

Students are introduced to (or have reinforced from previous introduction, e.g., in RENR 205) basic theories and measurement techniques in ecological science, with a focus on the use of measurements to learn about the structure and function of ecological systems. These tools are then used to build a dataset that will be analyzed and results synthesized in a final ecological report. The data for that report come from four separate lab sessions, three of which involve field data collection. Students collect their own data, must identify relevant questions to ask and assess and analyze the data collected in the context of those questions.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):

Students are asked to communicate their understanding orally and in writing throughout the course. Particular assignments meant to develop communication skills include the ecological report and a final oral presentation on an ecological topic. Each student writes their own report in phases, each phase is graded by the instructor and the student can then improve the next draft, including the final, based on feedback received. The final oral presentation is also done individually on a topic chosen by the student, in consultation with the instructor. These skills are also being developed in written assignments and through dialog encouraged in lab as methods are learned and data being collected.

Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

This course is strongly empirically-based. Students begin to collect their own data early on, are introduced to analytical tools that require basic statistical assumptions, and use data analysis and graphing tools throughout the semester. In multiple sessions, student must collect data, provide summaries and graphical representations of those data, and then
Texas A&M University

Core Curriculum

*Initial Request for a Course Addition to the Fall 2014 Core Curriculum*

interpret and analyze their observations in the context of a specific question about ecological states and processes.

Teamwork (to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal):

The course activities are all structured as group activities (with the exception of the brief introductory lectures provided to orient and provide general instruction). Students must cooperate, especially during field data collection, including shared duties like making a measurement and recording it, setting up measurement quadrats, transects, and sharing and sometimes debating the identities of the biota they are tasked with reporting on. Teamwork is essential in completing the course activities and objectives. Teamwork is evaluated throughout the course informally by the instructor providing feedback to students on data collection activities, record-keeping, and data analysis. Since all data collection is conducted in small groups and then organized and synthesized in in-class assignments, as well as in a final report, feedback and evaluation of teamwork effectiveness is also provided through written assessments of these assignments during the semester by the instructor.

Please be aware that instructors should be prepared to submit samples/examples of student work as part of the future course recertification process.
Course title and number  RENR 215
Term  Fall Spring 2013
Meeting times and location  ANIN 115

Course Description and Prerequisites

This course will introduce students to the general principles, methods, and equipment for field-based investigation of the biotic and abiotic components of an ecosystem and their interactions, specifically:

(1) Introduce the design and procedure of field ecological investigation, data analysis and report writing for quantitative description of ecosystems consisting of biological communities (interacting plant, animal and microbial populations) and their abiotic environment.

(2) Acquaint students with the variety of ecosystems found in Texas, as well as a variety of species and some of their special adaptations to their environments.

Prerequisites: None

Learning Outcomes or Course Objectives

1. Describe the basic components of coupled socio-ecological systems and interpret processes at the organism, population, community, ecosystem, landscape and global levels.
   • Define the functions of the different levels
   • Describe how and why plants compete and how competition can be measured
   • Describe plant growth processes
   • Describe how and why plants compete and how competition can be measured
   • Discuss spatial and temporal scaling in ecosystems
   • Describe population dynamics and interactions between organisms, including competition, predation, mutualism, etc.
   • Explain the differences and similarities of organism, population, community, and ecosystem scales

2. Identify plants and other organisms in their genetic and evolutionary context.
   • Recognize and organize adaptations and functional relationships
   • Discuss the implications of genetic change in the environment
   • Discuss the importance genetic variation within species and populations
   • Describe how and why landscape fragmentation affects biodiversity and conservation (e.g., endangered, invasive species)
   • Relate paleoecology to climate

3. Evaluate conceptual, statistical, and quantitative ecological models and systems thinking.
   • Draw a basic flow chart to represent ecological processes
• Describe key components of a model and the modeling process

4. Design management strategies for restoring and sustaining ecosystem goods and services and adaptive management concepts.
• Describe principles of ecosystem resilience

5. Illustrate critical thinking and demonstrate problem solving skills
• Apply critical thinking elements to demonstrate intellectual integrity
• Recognize problematic situations and predict possible outcomes
• Forecast a range of outcome that may arise from climate change

6. Demonstrate environmental stewardship and professional and ethical behavior.
• Demonstrate environmental stewardship
• Design a sound management plan that sustains natural resource uses
• Identify current and past practices and or policies that have led deleterious effects

7. Recognize the need for lifelong learning and exhibit the skills necessary to acquire, organize, and reorganize new knowledge.
• Desire to continue education and knowledge in your field, and discuss current topics with your peers
• Read professional literature and apply information to the solution of real world problems
• Read professional literature and apply information to the solution of real world problems
• Locate the research papers available on the (USDA, P-2 Southern) web site

Instructor Information

Name Jason West
Telephone number 979-845-3772
Email address jbwest@tamu.edu
Office hours TBA
Office location ANIN 413

Textbook and/or Resource Material


Work Book – iBook, also available as an Adobe pdf on eLearning course page.

Grading Policies

(A: 90-100%; B: 80-89%; C: 70-79%; D:60-69%; F: <60%)

Attendance* (1st absence-5 pts, 2nd-5 pts, 3rd-10 pts) 20 points
Quizzes (4 @ 10 pts each) 40 points
Lab Assignments (points vary by assignment) 85 points
Ecological Report (Final Draft)                              60 points
Topic Review Presentation                                  20 points

Total (100%)                                               225 points

Extra Credit Assignment                                    +15 points

No late work will be accepted, except in the case of a university excused absence.

*Missing a lab without a written excuse will be counted as an absence.

Attendance Policy

"The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at http://student-rules.tamu.edu/rule07."

Course Topics, Calendar of Activities, Major Assignment Dates

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Quiz/Work due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 29</td>
<td>Introduction; Natural regions of Texas</td>
<td></td>
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<tr>
<td>Sep 5</td>
<td>Plant and animal adaptations (lab)</td>
<td>Assign. 1 (PAA) due</td>
</tr>
<tr>
<td>Sep 12</td>
<td>Environmental factors (lab &amp; field)</td>
<td>Quiz 1 (NRT &amp; PAA)</td>
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<tr>
<td></td>
<td></td>
<td>Assign. 2 (EF) due</td>
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<tr>
<td>Sep 19</td>
<td>Population studies (lab)</td>
<td>Quiz 2 (EF)</td>
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<td></td>
<td></td>
<td>Assign. 3 (PS) due</td>
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<tr>
<td>Sep 26</td>
<td>Lentic Ecosystems (field)</td>
<td></td>
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<tr>
<td>Oct 3</td>
<td>Lotic Ecosystems (field)</td>
<td>Quiz 3 (L/L)</td>
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<td>Assign. 4 (L/L) due</td>
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<tr>
<td>Oct 10</td>
<td>Oak Woodlands Ecosystems - I. Reconnaissance (field)</td>
<td>Assign. 5 (LCPT) due</td>
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<tr>
<td>Oct 17</td>
<td>Introduction to sampling Community sampling methods (lab)</td>
<td>Assign. 6 (Intro) due Assign. 7 (SM) due</td>
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<tr>
<td>Oct 24</td>
<td>Oak Woodlands Ecosystems - II. Plant community - savannah (field)</td>
<td>Quiz 4 (SM)</td>
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<tr>
<td>Oct 31</td>
<td>Oak Woodlands Ecosystems - III. Plant community - bottomland</td>
<td></td>
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</tbody>
</table>
forest (field)

Nov 7  Oak Woodlands Ecosystems - IV. Animal communities (lab/field)
        Assign. 8 (PC) due

Nov 14 Oak Woodlands Ecosystems - V. Ecosystem restoration & mgt
        Topics Review Presentations
        Assign. 9 (ER) due
        Presentations due

Nov 21 Thanksgiving week (no lab)

Other Pertinent Course Information

Much of the work done in RENR 215 is conducted in the field, regardless of weather conditions. Whenever field (outdoor) labs are scheduled, students should wear appropriate field clothing. If a field lab is scheduled and inclement weather occurs, the lab will move to a classroom. However, students should never assume a field lab would be moved indoors. A university van will be used for field trips.

If a university excused absence occurs, students should immediately make arrangements with their TA to make up the lab before the end of the week or make other arrangements if that is not possible. All excuses must be registered within a week after the student returns to class. For absences without proper written excuse, up to 20 attendance points will be taken off the grade total and no make-ups will be given.

Ecological Report

The series of labs on Oak Woodland Ecosystems is designed, through field investigation and data analysis, to characterize the structure of the ecosystems, and to understand how the interactions of biotic and abiotic components as well as human activities, shape the structure of these ecosystems. Detailed investigation will focus on the upland savannah and bottomland forest ecosystems. The findings, as well as approaches used, will be documented in an ecological report. Below is a general guideline for the structure and content of this report. The instructor will provide additional instructions throughout the semester.

I. Introduction and Study Area
   - Describe the general environmental and biotic characteristics of the study area.
   - State the general goal of the investigation and why it is important or relevant to understanding the ecology and management of the ecosystems
   - State the specific objective(s) of the study.

II. Methods
   - Accurately describe the materials and procedures used in field sampling and data analysis. The description should contain sufficient information for others to repeat the procedure.
III. Results and Discussion

- Present the results of field sampling and data analysis in summary tables and/or figures. Refer to the figures and tables explicitly in the text.

- Address key questions, such as:
  - What similarities/differences exist between the upland and bottomland areas?
  - What is the ecological meaning and significance of the results?
  - What patterns of ecosystem structures were revealed through comparison of the biotic and abiotic components of different ecosystems?
  - What are the influences of human activities on the structure of these ecosystems?

- Recommend future studies needed to better our understanding of the system, and management approaches needed for the conservation and/or restoration of the ecosystems.

IV. References

- List any references, such as our lab manual and other books and papers that you cited in any of the above sections in a standard reference format.

- The finished report should be 4-6 pages long (1 inch margins, 1.5 line-spaced, no larger than 12-point fonts), plus Tables and/or Figures.

- Individual sections of the ecological report will be written as weekly assignments and revised based on the feedback provided by the instructor. Revised sections must be turned in for grades.

- Each of these writing assignments, for individual sections as well as the complete Ecological Report, must be emailed to your TA. In sending the files, the following formats should be followed:
  - The report must be saved in Microsoft Word, Open Office, or Adobe pdf format.
  - File names should include the initials of your first and last name and the last 4 digits of your UID number, plus the letter “A” and assignment number (without the “A#” for the complete Ecological Report).
  - Example – for Assignment 5 (Introduction section), the file name should be JD9944AS5 for student John Doe whose UID is 454459944 (just JD9944 for the complete Ecological Report). Note there are no dashes or spaces. Follow this format exactly.
  - Files will be stored in a central database and may be checked for plagiarism (e.g., with resources such as Turnitin.com). Use of old reports or reports from other RENR 215 students will result in pursuit of an immediate grade of “F” for the class. See also the Aggie Honor Code discussed above.
Ecological Report Grading Sheet

Correct format: all parts with headings                          10 pts
Word usage (correct grammar, complete sentences)             5 pts
Overall neatness and legibility                              5 pts
Introduction and Study Area                                  15 pts
Methods                                                       15 pts
Results & Discussion                                          10+20 pts
Total                                                         80 pts

How to cite References

by Tamara McGuire

When you use a quote, fact, or idea that is not your own, you need to reference the source of that information. If not, you are plagiarizing someone else’s work, regardless of your intention. Referencing gives credit where credit is due, and provides your readers with a way to learn more about your subject and to verify your facts. Sometimes it is difficult to know when to reference something. If in doubt, go ahead and reference. It is not necessary to reference information that is common knowledge. For example, if you were to say in a report, “elephants are very large mammals”, there is no need to reference this. However, if you were to write, “Elephants in the country of Gabon weigh a maximum of 500 kg and can reach 3.5 m in height”, you should refer to the source of this information, as it is doubtful that you measured this yourself.

When you research your paper, it is a good idea to get into the habit of writing down the reference information in addition to the facts. It will help you later in making your list of references if you decide to use the information in your paper, and will give you a paper trail to follow if you need to go back and re-check something. It may also save you the embarrassment of mistaking an idea as your own, when it was actually already “claimed” by someone else (there is nothing wrong with agreeing, disagreeing, or expanding on someone else’s idea, just be sure to reference).

In order to reference, you will need to note the author(s), title of the article or book, the name of the journal in which it is published, the page numbers of the article, the year of publication, and the publisher. If you are citing a chapter in a book that has many contributors, you will have to list the editor of the book. There are different styles of referencing literature; in this class, we will only discuss one. This system is often called the Harvard system (Day 1988). In the body of your paper, list the author’s last name and year of publication in parentheses after the item you are referencing. If there are two authors, list them both.

Ex. River dolphins are listed as a vulnerable species (Klinowska 1991).

Ex. River dolphins weigh 150 kg (Leatherwood and Reeves 1983).

If there are more than two authors, use only the last name of the first author, followed by the words “et al.” (which basically means “and others”), then the year of publication.

Ex. Dolphin populations were clustered along the Amazon River (Magnusson et al. 1980).

You will give the full reference citation at the end of your paper, in the part called
“References” or “Literature Cited”. Citations should be arranged alphabetically, according to the first letter of the last name of the first author (confused yet?).

All this means is that a list of the following authors would look like this:


Magnusson, W. E., R. C. Best, and V. M. F. da Silva. 1980. Number and behavior of Amazon dolphins, Inia geoffrsei and Sotalia fluviatilis in the Rio Solimoes, Brazil. Aquatic Mammals. 8:27-32. (These numbers indicate that the article was found in volume 8, pages 27-32).

Double check that any reference you used in your paper is in the “References” section, and that you didn’t list any papers in the ‘References” section that you didn’t actually refer to in you paper.

**Recommended Readings (Evans library has both of them):**


**Americans with Disabilities Act (ADA)**
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, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu

**Academic Integrity**

*For additional information please visit: http://aggiehonor.tamu.edu*

*“An Aggie does not lie cheat, or steal, or tolerate those who do.”*
Texas A&M University

Core Curriculum

Initial Request for a lower division course included in the current Core Curriculum
to be considered for the Fall 2014 Core Curriculum

1. This request is submitted by (department name): Physics and Astronomy

2. Course prefix and number: ASTR/PHYS 109

3. Texas Common Course Number: 

4. Complete course title: Big Bang & Black Holes

5. Semester credit hours: 3

6. This request is for consideration in the following Foundational Component Area:

☐ Communicator
☐ Mathematics
☒ Life and Physical Sciences
☐ Language, Philosophy and Culture
☐ Creative Arts
☐ American History
☐ Government/Political Science
☐ Social and Behavioral Sciences

7. This course should also be considered for International and Cultural Diversity (ICD) designation:

☐ Yes  ☒ No

8. How frequently will the class be offered? fall and spring semesters

9. Number of class sections per semester: 2

10. Number of students per semester: 100

11. Historic annual enrollment for the last three years: 172, 184, 162

This completed form must be attached to a course syllabus that sufficiently and specifically details the appropriate core objectives through multiple lectures, outside activities, assignments, etc. Representative from department submitting request should be in attendance when considered by the Core Curriculum Council.

12.

13. Submitted by: [Signature]

Course Instructor

Date: 2/27/2013

Approvals: [Signature]

Date: 4/1/2013

14. Department Head

Date: 4/1/113

15. College Dean/Designee

Date:

For additional information regarding core curriculum, visit the Texas Higher Education Coordinating Board website at www.thecb.state.tx.us/corecurriculum2014

See form instructions for submission/approval process.
Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

Foundational Component Area: Life and Physical Sciences

In the box below, describe how this course meets the Foundational Component Area description for Life and Physical Sciences. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

The proposed course must contain all elements of the Foundational Component Area. How does the proposed course specifically address the Foundational Component Area definition above?

This course is designed to give an intuitive understanding of the Big Bang and Black Holes, without mathematics, and de-mystify it for non-scientists. The primary goal is for students to use critical thinking about the origin and evolution of the universe and communicate their understanding using their own words to a lay audience. They will use deductive and empirical reasoning to do evidence based-decision making.

Core Objectives

Describe how the proposed course develops the required core objectives below by indicating how each learning objective will be addressed, what specific strategies will be used for each objective and how student learning of each objective will be evaluated.

The proposed course is required to contain each element of the Core Objective.

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

Before lecture students are required to do the reading and ask critical questions before the lecture period. This naturally aids in the synthesis of material. They then bring those questions to class, where the normal lecture period time is done in a manner of Interactive Engagement, including iClicker questions and synthesis of information. Their primary assignments are short, written documents which require them to synthesize information into a succinct summary in lay language and explain their decision making pedagogy.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):

Students communicate a number of ways throughout the course. In particular, they are required to write multiple papers in a way that they must communicate modern scientific information in lay language. They must interpret data through graph during the reading, and there are many times during the lecture time where they must discuss their thoughts with peers during clicker question times.

Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

The students must bring in empirical data and observational facts to explain their evidence-based reasoning in their course in the context of established scientific theories such as Quantum Mechanics and
Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

General Relativity.

Teamwork (to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal):

The teamwork portion of the course activities are designed to mimic how undergraduate, graduate, postdoctoral and faculty interact in a research environment as a team. This is done in two ways: To discuss the issues, and to work together on the production of a scientific document.

Discussion teamwork: To facilitate discussion between students on science issues as is done in a typical research team, pairs of students are given a conceptual question (in class) and they are to discuss and work together to understand the question and determine the correct answer. They are required to discuss verbally as a two or three person team, but (for evaluation purposes, enter their own answer during lecture with a iClicker. Often these discussion involve discussions with the lecturer for clarification and hints. Thus, like in real research teams they probe the ideas to arrive at a common, and correct understanding.

Written teamwork: As much of science is done in written fashion, where much of the learning comes during the iteration process, a central part of the course is in writing. As is often done in science, especially in physics and astronomy, a typical paper is done where multiple authors collaborate on a single document, but with a lead author and collaborating authors. In this course we include writing assignments where each student interacts and collaborates, in written fashion, with multiple reviewers. While this is not done in person (although that option is available as students draft their original paper), each student writes their own paper and submits it to the Calibrated Peer Review (CPR) system (http://people.physics.tamu.edu/toback/109/WritingAssignments/Why_use_CPR.pdf). This system facilitates the process of teaching students how to evaluate documents using example papers and rubrics. After training for each assignment, each student provides written commentary on the work of others, and is typically expected to incorporate written commentary into their own work. In particular, they give and receive feedback from their peers on their writing assignments and use this feedback for revisions to improve their writing communication skills. As in any building up of competent team members, students are evaluated on the quality of their writing, how well they assess the quality of a document, and how well they provide useful feedback to others. As a side benefit, they learn how to incorporate the value of team work by learning to be a better team member to themselves.

In this context, the discussion-in-class activity supports teamwork directly as students verbally discuss different points of view and work effectively with others to support a shared purpose goal. Similarly, the team-activity of providing written feedback to team members (and incorporating feedback from others) builds better teamwork skills as students development of excellent papers. Indeed, giving and using written feedback as part of a team further gives the opportunity to give and receive different points of view and to learn the difficult skill of effectively incorporating feedback from team members into a document.

Please be aware that instructors should be prepared to submit samples/examples of student work as part of the future course recertification process.
ASTR/PHYS 109: Big Bang and Black Holes

Fall 2013

Course objectives: This course is designed to give an intuitive understanding of the Big Bang and Black Holes, without mathematics, and de-mystify it for non-scientists. The primary goal is for students to use critical thinking about the origin and evolution of the universe and communicate their understanding using their own words to a lay audience. They will use deductive and empirical reasoning to do evidence based-decision making.

Prerequisites: None

Instructor: Prof. David Toback
Office: Mitchell Institute (MIST), Room M425
Email: toback@tamu.edu
Course website: http://faculty.physics.tamu.edu/toback/109

Textbook: “Big Bang, Black Holes, No Math,” by Toback (Web download)
Recommended books:
“A Briefer History of Time,” by Hawking and Mlodinow
“Theory of Everything,” by Hawking
“Stephen Hawkings’s Universe,” by Filkin
“The First Three Minutes,” by Weinberg
Other readings to be downloaded from the web

Course Work and Grading: The bulk of the grade for this course is in the writing component. A premium will be placed on the ability to understand and convey the excitement about science, cosmology and the physical universe to the lay reader. Note that you cannot pass the course without completing all the assignments. Some portions of the assignments will be pass/fail, and there will be a few assignments where you will be required to pass in order to pass the course. By percentage, the grade is based on:
- Short papers: 90%
- In-class quizzes/pre-lecture reading questions: 5%
- End-of-Chapter online quizzes: 5%
Answer to frequently asked questions about grading can be found at http://people.physics.tamu.edu/toback/109/109FAQ.shtml

Students in the Honors Sections: The regular sections and honors section meet together during the regular class period. However, each honors student will have an additional Research Paper that will be part of their paper grade. More information about it can be found at http://faculty.physics.tamu.edu/toback/109/honors.shtml

Description of the writing instruction: Each paper assignment will submitted online and graded using the Calibrated Peer Review system (cpr.tamu.edu) which we will refer to as CPR. Many students find using CPR to be the most difficult and unpleasant portion of the course. The instructor believes reviewing papers, as a way of learning to critique your own work, is the most
important part of the class and one of the best ways to improve your writing. We will spend time discussing each paper in class.

We are here to help you get excellent grades if you will put in the time and effort required. Before each paper is due, students will be encouraged to submit drafts to the TA for feedback with enough time for the TA to respond with comments. This will help produce an excellent final draft paper. Getting help from the TA's during both the writing and the Calibration stages of CPR will be encouraged. In the case that you don't get the grade you want on the full paper score, you will be encouraged to resubmit your paper. However, doing so requires doing the full the CPR process again. In general, we will take the average of the two scores as long as the first draft shows a "good-faith" effort. Exceptions will be made in rare cases.

Since many students are not used to working with the CPR system, the first paper will be graded pass/fail. A student must pass both the text portion as well as the Calibration stages in order to pass the assignment. Students will be required to resubmit the first paper until they receive a passing grade in order to pass the course.

**ADA Policy:** The American's 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 the Department of Disability Services in Cain Hall B118, call 845-1637, or e-mail disability@tamu.edu. Additional information is available at http://disability.tamu.edu.

**Honor Code:** The Aggie Honor Code states, "An Aggie does not lie, cheat, or steal or tolerate those who do." Further information regarding the Honor Council Rules and Procedures may be found on the web at http://www.tamu.edu/aggiehonor. The plagiarism statement for the course can be found at http://faculty.physics.tamu.edu/toback/109/WritingAssignments/plagiarism.shtml

**50-Word Summary:** This course is designed to give an intuitive understanding of the Big Bang and Black Holes, without mathematics, and de-mystify it for non-scientists.
Texas A&M University

Core Curriculum

Initial Request for a lower division course included in the current Core Curriculum to be considered for the Fall 2014 Core Curriculum

1. This request is submitted by (department name): ATMO

2. Course prefix and number: ATMO 201

3. Texas Common Course Number:

4. Complete course title: Atmospheric Science

5. Semester credit hours: 3

6. This request is for consideration in the following Foundational Component Area:
   
   [ ] Communication
   [ ] Mathematics
   [x] Life and Physical Sciences
   [ ] Language, Philosophy and Culture
   [ ] Creative Arts
   [ ] American History
   [ ] Government/Political Science
   [ ] Social and Behavioral Sciences

   Current Core - Yes

7. This course should also be considered for International and Cultural Diversity (ICD) designation:

   [ ] Yes
   [x] No

8. How frequently will the class be offered? every semester, including summer

9. Number of class sections per semester: 4 during fall and spring, 2 during summer

10. Number of students per semester: ~300 during fall and spring, ~60 during summer

11. Historic annual enrollment for the last three years: 660 736 601

This completed form must be attached to a course syllabus that sufficiently and specifically details the appropriate core objectives through multiple lectures, outside activities, assignments, etc. Representative from department submitting request should be in attendance when considered by the Core Curriculum Council.

13. Submitted by:

   Course Instructor

   Date: 3/11/13

   Approvals:

   [x] R. Sanchez (for PT)

   Date: 3/11/13

14. Department Head

   Date: 3.19.13

15. College Dean/Designee

   Date

For additional information regarding core curriculum, visit the Texas Higher Education Coordinating Board website at www.thecb.state.tx.us/corecurriculum2014

See form instructions for submission/approval process.
Texas A&M University
Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

Foundational Component Area: Life and Physical Sciences

In the box below, describe how this course meets the Foundational Component Area description for Life and Physical Sciences. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

How does the proposed course specifically address the Foundational Component Area definition above?

- From droughts to flooding, severe storms to climate change, the behavior of the atmosphere has important impacts on both societies and individuals. In fact, weather affects every person, every day, around the world.

Specific objective of the class include:

- To understand how the scientific method underpins research in atmospheric sciences.
- To understand typical meteorological products and data and make simple forecasts of weather conditions based on these tools.
- To be able to use your knowledge of atmospheric science principles to interpret the weather you experience every day.
- To provide the basis for assessing the implications of weather and climate variability on business, policy, and society.

Core Objectives

Describe how the proposed course develops the required core objectives below by indicating how each learning objective will be addressed, what specific strategies will be used for each objective and how student learning of each objective will be evaluated.

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

The atmosphere is a complex physical system. To understand it requires an application of concepts from physics, math, and chemistry. Weather and climate have important impacts on human systems (e.g., drought conditions and fire danger, lightning and aviation safety, flooding and insurance.) Ideas from social sciences such as psychology, economics, and geography are also relevant to this course. Inquiry in atmospheric sciences requires the integration of concepts and ideas from a wide range of fields and the synthesis and evaluation of a range of data and models. Gains in critical thinking in the context of atmospheric sciences will be measured through student ability to answer higher-order, problem-based questions on tests.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):

Students will be asked questions daily (orally in class and in writing via quizzes, tests, or teaching technology devices) that synthesize material from the current or previous lecture. Students will ask questions during class to add depth and complexity to the lecture. Students will share and explain relevant weather stories, illustrated visually by appropriate pictures and maps, which will be displayed by the professor at the beginning of class. Samples of student writing and other work will be collected over the course of the semester and used to assess changes in communication skills.
Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

Students will make basic mathematical calculations to understand concepts and physical laws fundamental to the atmosphere (e.g., how temperature changes with elevation or altitude, determining relative humidity, understanding the exponential increase in damage with increasing hurricane category). In their assignments students will be asked to routinely interpret maps and accompanying graphs of relevant weather variables, developing quantitative and communication skills simultaneously. These products will serve as evidence of student learning.

Teamwork (to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal):

Students will interact with one another when questions are asked in class and during small-group activities. Students will work together on larger group projects. In these projects teamwork will be encouraged through the recognition of multiple points of view as students discuss how to evaluate sources of uncertainty in scientific understanding and the role of such uncertainties in operational weather forecasting. Student participation will be assessed by a teamwork rubric.

Please be aware that instructors should be prepared to submit samples/examples of student work as part of the future course recertification process.
Course title and number: ATMO 201 Atmospheric Science, Section 503
Term: Spring 2013
Meeting times and location: MWF 1:50 PM-2:40 PM, Eller O&M 112

Course Description
This course covers the physical processes (and the underpinning concepts) that define and produce weather and climate. Key concepts emphasized in the course include pressure, temperature, clouds, and precipitation. Processes emphasized include the formation of weather phenomena such as fronts, severe storms, hurricanes, and tornadoes.

Learning Outcomes
At the conclusion of the course, the student will be able to:
• define and describe atmospheric science principles;
• apply typical meteorological tools to interpret data;
• draw conclusions from analyses of data using scientific methods to make forecasts of weather conditions; and
• use this knowledge to interpret and assess the implications of weather and climate variability on business, policy, and society, short term and long term.

Core Objectives

Critical thinking
The atmosphere is a complex physical system. To understand it requires an application of concepts from physics, math, and chemistry. Weather and climate have important impacts on human systems (e.g., drought conditions and fire danger, lightning and aviation safety, flooding and insurance.) Ideas from social sciences such as psychology, economics, and geography are also relevant to this course. The integration of concepts and ideas from such a wide range of fields involves synthesis and evaluation from diverse intellectual areas and points of view.

Communication
Students will be asked questions daily (orally in class and in writing via quizzes, tests, or teaching technology devices) that synthesize material from the current or previous lecture. Students will ask questions during class to add depth and complexity to the lecture. Students will share and explain relevant weather stories, illustrated visually by appropriate pictures and maps, which will be displayed by the professor at the beginning of class.

Empirical and quantitative skills
Students will make basic mathematical calculations to understand concepts and physical laws fundamental to the atmosphere (e.g., how temperature changes with elevation or altitude, determining relative humidity, understanding the exponential increase in damage with increasing hurricane category). Students will be asked to routinely interpret maps and accompanying graphs of relevant weather variables, developing quantitative and
communication skills simultaneously.

Teamwork
Students will work in teams to produce the weather stories and when problems are presented in class. They will also work together on larger group projects. This class is associated with ATMO 202, a laboratory in which teamwork is also featured.

Instructor Information

Name: Dr. Courtney Schumacher
Contact: 979-845-5622, cschu@tamu.edu
Office hours: MW 3:00-5:00 PM or by appointment
Office location: Eller O&M 1007B

Textbook

*Extreme Weather & Climate* (Ahrens and Samson, 1st edition) can be purchased at the bookstore or at [www.engagebrain.com/shop/micro/tamuatmo201](http://www.engagebrain.com/shop/micro/tamuatmo201).

Grading Policies

Your grade will be determined based on the following standard grading scale where 90 and above = A, 80-89% = B, 70-79% = C, 60-69% = D, and 59 and below = F. Grades will be posted on elearning.tamu.edu.

- Three exams: 20% each
- Final exam: 20%
- Quizzes/class assignments: 10%
- Class participation: 10%

Exams
Three semester exams and one final exam will be given in Room 112 of Eller O&M. *Exams missed for reasons other than a university excused absence will be given a grade of zero.* Make-up exams will only be given for university excused absences and will be part essay format. All material presented in the lectures and required readings will be testable. The final exam is scheduled for Tuesday, May 7 from 3:30-5:30 PM and will cover topics taught since the third exam. While the final exam will not directly test material covered prior to the third exam, some questions may apply the older material to the newer concepts.

Aggie Honor Code

"An Aggie does not lie, cheat, or steal, or tolerate those who do."

For additional information please visit [http://aggiehonor.tamu.edu](http://aggiehonor.tamu.edu)

Americans with Disabilities Act (ADA)

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, in Cain Hall, Room B118, or call 845-1637. For additional information visit disability.tamu.edu
<table>
<thead>
<tr>
<th>Date</th>
<th>Chapter</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/14</td>
<td>1</td>
<td><em>Syllabus, The Turbulent Atmosphere</em></td>
</tr>
<tr>
<td>1/16</td>
<td>1</td>
<td>The Turbulent Atmosphere</td>
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<tr>
<td>1/18</td>
<td>1</td>
<td>The Turbulent Atmosphere</td>
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<tr>
<td>1/21</td>
<td>2</td>
<td>MLK DAY-NO CLASS</td>
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<tr>
<td>1/23</td>
<td>2</td>
<td>Energy that Drives the Storms</td>
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<td>1/28</td>
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<td>Energy that Drives the Storms</td>
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<td>1/30</td>
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<td>Energy that Drives the Storms</td>
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<tr>
<td>2/1</td>
<td>3</td>
<td>Temperature and Humidity Extremes</td>
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<tr>
<td>2/4</td>
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<td>2/6</td>
<td>3</td>
<td>Temperature and Humidity Extremes</td>
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<tr>
<td>2/8</td>
<td>4</td>
<td>EXAM ONE (Chapters 1-3)</td>
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<tr>
<td>2/11</td>
<td>5</td>
<td>The Earth’s Changing Climate</td>
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<tr>
<td>2/13</td>
<td>5</td>
<td>The Earth’s Changing Climate</td>
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<td>2/15</td>
<td>4</td>
<td>Condensation in the Atmosphere</td>
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<td>2/18</td>
<td>5</td>
<td>Clouds and Stability</td>
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<td>2/20</td>
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<td>2/22</td>
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<td>Clouds and Stability</td>
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<td>2/25</td>
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<td>Precipitation Extremes</td>
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<td>Precipitation Extremes</td>
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<td>7</td>
<td>Optics</td>
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<td>3/4</td>
<td>7</td>
<td>EXAM TWO (Chapters 15, 4-6)</td>
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<td>3/6</td>
<td>8</td>
<td>Atmospheric Motions</td>
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<td>3/8</td>
<td>8</td>
<td>Atmospheric Motions</td>
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<tr>
<td>3/11-15</td>
<td>9</td>
<td>SPRING BREAK-NO CLASS</td>
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<tr>
<td>3/18</td>
<td>9</td>
<td>Atmospheric Motions</td>
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<tr>
<td>3/20</td>
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<tr>
<td>3/22</td>
<td>10</td>
<td>Wind Systems</td>
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<td>3/25</td>
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<td>3/29</td>
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<td>READING DAY-NO CLASS</td>
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<tr>
<td>4/1</td>
<td>11</td>
<td>Air Masses and Fronts</td>
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<tr>
<td>4/3</td>
<td>11</td>
<td>Mid-Latitude Cyclonic Storms</td>
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<td>4/5</td>
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<tr>
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<td>11</td>
<td>Mid-Latitude Cyclonic Storms</td>
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<tr>
<td>4/10</td>
<td>12</td>
<td>EXAM THREE (Chapters 7-10)</td>
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<tr>
<td>4/12</td>
<td>12</td>
<td>Texas Climate</td>
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<tr>
<td>4/15</td>
<td>12</td>
<td>Weather Forecasting</td>
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<tr>
<td>4/17</td>
<td>12</td>
<td>Weather Forecasting</td>
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<tr>
<td>4/19</td>
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<td>Thunderstorms</td>
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<td>4/22</td>
<td>13</td>
<td>Tornadoes</td>
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<tr>
<td>4/24</td>
<td>13</td>
<td>Tornadoes</td>
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<tr>
<td>4/26</td>
<td>13</td>
<td>Hurricanes</td>
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<tr>
<td>4/29</td>
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<tr>
<td>4/30</td>
<td>13</td>
<td>REDEFINED DAY-Hurricanes</td>
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<tr>
<td>5/7</td>
<td>13</td>
<td>FINAL EXAM (Chapters 11-14) TUE 3:30-5:30 PM</td>
</tr>
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</table>
Texas A&M University
Core Curriculum
Initial Request for a lower division course included in the current Core Curriculum
to be considered for the Fall 2014 Core Curriculum

1. This request is submitted by (department name): ATMO

2. Course prefix and number: ATMO 202  3. Texas Common Course Number: ____________

4. Complete course title: Atmospheric Science Laboratory  5. Semester credit hours: 1

6. This request is for consideration in the following Foundational Component Area:
   □ Communication  □ Creative Arts
   □ Mathematics  □ American History
   ☒ Life and Physical Sciences  □ Government/Political Science
   □ Language, Philosophy and Culture  □ Social and Behavioral Sciences
   ○ Current core - YES

7. This course should also be considered for International and Cultural Diversity (ICD) designation:
   ☒ Yes  ☐ No

8. How frequently will the class be offered? every semester, including summer

9. Number of class sections per semester: fall: 8; spring: 10; summer: 1 or 2

10. Number of students per semester: fall: ~200; spring: ~220; summer: ~20

11. Historic annual enrollment for the last three years: 400  442  449

This completed form must be attached to a course syllabus that sufficiently and specifically details the appropriate core objectives through multiple lectures, outside activities, assignments, etc. Representative from department submitting request should be in attendance when considered by the Core Curriculum Council.

13. Submitted by: [Signature]
   Course Instructor
   Date: 3/11/13

14. Department Head
   Approvals: [Signature] (for PY)
   Date: 3/11/13

15. College Dean/Desigee
   Date: 3/19/13

For additional information regarding core curriculum, visit the Texas Higher Education Coordinating Board website at www.thecb.state.tx.us/corecurriculum2014

See form instructions for submission/approval process.
Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

Foundational Component Area: Life and Physical Sciences

In the box below, describe how this course meets the Foundational Component Area description for Life and Physical Sciences. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

How does the proposed course specifically address the Foundational Component Area definition above?

The atmosphere is a complex and fascinating physical system, and its behavior can have important impacts on both societies and individuals. In ATMO 202, students explore atmospheric processes by working hands-on with real-world weather and climate data. By the end of the course, students should be able to:

- Analyze data on pressure, temperature, humidity, and winds, and use this data to infer the state of the atmosphere.
- Use upper-air and surface meteorological charts to interpret and explain the evolution of weather systems.
- Identify cloud types, and explain how certain types are associated with specific weather patterns.
- Summarize the operation, accuracy and precision of the various instruments used to take meteorological data.
- Apply these skills to make informed decisions about weather forecasting, prediction of extreme events, and implications of weather and climate on human safety and security and understand how the scientific method underpins research and discovery in atmospheric sciences.

Core Objectives

Describe how the proposed course develops the required core objectives below by indicating how each learning objective will be addressed, what specific strategies will be used for each objective and how student learning of each objective will be evaluated.

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

The atmosphere is a complex system, requiring contributions from a number of physical and chemical disciplines. In the course students are introduced to the basic discipline-based principles and then they apply their understanding to interpret real-world weather events. Weekly exercises are given in which students must analyze and interpret data from actual, observed weather systems and/or climate trends. These exercises will be evaluated to provide evidence of improved critical thinking skills in the context of atmospheric sciences.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):
Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

Students are asked to make at least one brief, in-class oral presentation on a current or historical weather event of their choice. Weekly exercises and exams are given including numerous short-answer questions, asking students to explain in writing the reasoning behind their responses. These oral and written presentations, illustrated by appropriate visuals including maps and graphs, will be evaluated to measure student achievement.

Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

Students are introduced to a variety of quantitative physical and chemical relationships, and then use these relationships to make inferences and predictions. Data is presented in a variety of formats, including tables, line graphs, contour and gradient plots, vector plots, meteograms, and isosurfaces. Student fluency in interpretation and ability to apply data-driven conclusions will be assessed by lab reports.

Teamwork (to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal):

Students will work together in small groups to prepare short in-class oral presentations on weather events. Students are also encouraged to develop teamwork skills by working together on weekly lab assignments. Weekly laboratory assignments feature using the scientific method in atmospheric sciences and include exercises requiring consensus answers from small groups of students and discussions of sources of uncertainties in analysis techniques. Student participation will be assessed by a teamwork rubric.

Please be aware that instructors should be prepared to submit samples/examples of student work as part of the future course recertification process.
ATMO 202: Atmospheric Science Laboratory  
Section 504

Lab: 11:10 -- 1:00 R, O&M 1107  
Professor of Record: Dr. Courtney Schumacher  
semblu@tamu.edu  
Laboratory Instructor: John Orcutt, 1013 O&M  
jmo94@tamu.edu  
Office Hours: 5:00 - 4:00 M, 10:00 -- 11:00 WF (or by appointment)

Course Description

The atmosphere is a complex and fascinating physical system, and its behavior can have important impacts on both societies and individuals. In ATMO 202, students will explore atmospheric processes by working hands-on with real-world weather and climate data. By the end of this course, students should be able to:

- Analyze data on pressure, temperature, humidity, and winds, and use this data to infer the state of the atmosphere.
- Use upper-air and surface meteorological charts to interpret and explain the evolution of weather systems.
- Identify cloud types, and explain how certain types are associated with specific weather patterns.
- Summarize the operation, accuracy and precision of the various instruments used to take meteorological data.

Core Curriculum Objectives

Critical Thinking: The atmosphere is a complex system, requiring contributions from a number of physical and chemical disciplines. In the present course, students are introduced to the basic principles of the atmosphere and then asked to apply this understanding to interpret real-world weather events. Weekly exercises are given in which students must analyze and interpret data from actual, observed weather systems and/or climate trends.

Communication: Students are asked to make at least one brief, in-class oral presentation on a current or historical weather event of their choice. The presentation must include an analysis of a map or other appropriate visual, including video. Weekly exercises and exams are given including numerous short-answer questions, asking students to explain in writing and through the use of graphics the reasoning behind their responses.
Empirical and quantitative skills: Students are introduced to a variety of quantitative physical and chemical relationships, and then use these relationships to make inferences and predictions. Data is presented in a variety of formats, including tables, line graphs, contour and gradient plots, vector plots, meteograms, and isosurfaces.

Teamwork: Students will work together in small groups to prepare short in-class oral presentations on weather events. Students are also encouraged to work together on weekly lab assignments, with some exercises requiring consensus answers from a group. Team members evaluate each other and make suggestions on how to improve cooperation and collaboration.

Textbooks: A Laboratory Manual for this course is available for purchase from the campus bookstore. Please purchase the manual before the second week of class.

Access to a basic meteorology text (such as your ATMO 201 textbook) may be helpful, but is not required.

Course Webpage: http://atmo.tamu.edu/courses/atmo202/

Grading: Please write legibly when answering questions. To assign a grade, I must be able to read your answers. Your class average will be based on the assignments and exams, according to the following percentages

<table>
<thead>
<tr>
<th>Avg. of Exercises:</th>
<th>40%</th>
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<tbody>
<tr>
<td>Exam 1:</td>
<td>20%</td>
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<tr>
<td>Exam 2:</td>
<td>20%</td>
</tr>
<tr>
<td>Exam 3:</td>
<td>20%</td>
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</tbody>
</table>

Your final grade for the course will be based on the standard grading scale, as given by

| 90 - 100  | A   |
| 80 - 89   | B   |
| 70 - 79   | C   |
| 60 - 69   | D   |
| < 60      | F   |

I reserve the right to adjust the grade cutoffs downward if necessary, to achieve a fairer distribution of grades.

Late policy: Lab assignments are due at the beginning of the first class following the week in which the assignment is introduced. Late assignments (including those turned in at the end of class) will be accepted with a penalty of 20%. In the case of excused absences, late assignments will be accepted without penalty until one week after the last day of the excused absence.

Missed exams: Make-up exams will only be allowed for excused absences, as defined at http://student-rules.tamu.edu/rule07.
Plagiarism: You are encouraged to work together on the lab exercises, but you should nonetheless do your own work. There is a significant difference between working in groups and copying from a fellow classmate. Mindlessly copying another student's answers will not be tolerated and will result in zero credit. Dividing up an assignment and swapping answers will also be considered cheating and will also result in zero credit.

As required by University policy, all incidences of plagiarism or other academic dishonesty will be reported to the Honor Council.

Americans with Disabilities Act (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 the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall, or call 845-1637. For additional information visit http://disability.tamu.edu

Copyright Policy:
All materials used in this class are copyrighted. These materials include but are not limited to quizzes, exams, homework assignments, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless permission is expressly granted.

Academic Integrity Statement and Policy:
"An Aggie does not lie, cheat, or steal or tolerate those who do." Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Ignorance of the rules does not exclude any member of TAMU community from the requirements or the processes of the Honor System. Students who violate the University rules on academic dishonesty may be assigned a failing grade for the course and face additional sanctions as described in the University Regulations

For additional information please visit:  http://aggiehonor.tamu.edu/

See schedule on back page!
## Section 504 Schedule:
Thursday 11:10 AM – 1:00 PM

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Exercise</th>
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<tbody>
<tr>
<td>1</td>
<td>1/19</td>
<td>Introduction &amp; Clouds</td>
</tr>
<tr>
<td>2</td>
<td>1/26</td>
<td>Finish Clouds</td>
</tr>
<tr>
<td>3</td>
<td>2/2</td>
<td>Visual and Graphical Tools in Meteorology I</td>
</tr>
<tr>
<td>4</td>
<td>2/9</td>
<td>Visual and Graphical Tools in Meteorology II</td>
</tr>
<tr>
<td>5</td>
<td>2/16</td>
<td>Temperature &amp; Radiation</td>
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<tr>
<td>6</td>
<td>2/23</td>
<td>EXAM I (Clouds &amp; Visual Tools I &amp; II)</td>
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<tr>
<td>7</td>
<td>3/1</td>
<td>Pressure</td>
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<tr>
<td>8</td>
<td>3/8</td>
<td>Upper Air Charts / Surface Charts (two labs; due at end of class)</td>
</tr>
<tr>
<td>9</td>
<td>3/15</td>
<td>Spring Break</td>
</tr>
<tr>
<td>10</td>
<td>3/22</td>
<td>Atmospheric Moisture</td>
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<tr>
<td>11</td>
<td>3/29</td>
<td>EXAM II (Temperature, Pressure, Upper Air &amp; Surface Charts)</td>
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<td>12</td>
<td>4/5</td>
<td>Wind and Pressure</td>
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<td>13</td>
<td>4/12</td>
<td>Forecasting</td>
</tr>
<tr>
<td>14</td>
<td>4/19</td>
<td>Severe Weather (Due at end of class)</td>
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<tr>
<td>15</td>
<td>4/26</td>
<td>EXAM III (Moisture, Wind &amp; Pressure, Forecasting, Severe Weather)</td>
</tr>
</tbody>
</table>

**Schedule subject to change**
Texas A&M University
Core Curriculum

Initial Request for a lower division course included in the current Core Curriculum to be considered for the Fall 2014 Core Curriculum

1. This request is submitted by (department name): Physics and Astronomy

2. Course prefix and number: ASTR/PHYS 109
3. Texas Common Course Number: 

4. Complete course title: Big Bang & Black Holes
5. Semester credit hours: 3

6. This request is for consideration in the following Foundational Component Area:
   - [ ] Communication
   - [ ] Mathematics
   - [x] Life and Physical Sciences
   - [ ] Language, Philosophy and Culture
   - [ ] Creative Arts
   - [ ] American History
   - [ ] Government/Political Science
   - [ ] Social and Behavioral Sciences

7. This course should also be considered for International and Cultural Diversity (ICD) designation:
   - [ ] Yes
   - [x] No

8. How frequently will the class be offered? fall and spring semesters

9. Number of class sections per semester: 2

10. Number of students per semester: 100

11. Historic annual enrollment for the last three years: 172, 184, 162

This completed form must be attached to a course syllabus that sufficiently and specifically details the appropriate core objectives through multiple lectures, outside activities, assignments, etc. Representative from department submitting request should be in attendance when considered by the Core Curriculum Council.

12. Submitted by: [Signature]
    Course Instructor
    Date: 2/27/2013

13. Approvals:
    George R. Welch
    Date: 4/1/2013

14. Department Head
    Date: 4/1/11/13

15. College Dean/Designee

For additional information regarding core curriculum, visit the Texas Higher Education Coordinating Board website at www.thecb.state.tx.us/corecurriculum2014

See form instructions for submission/approval process.
In the box below, describe how this course meets the Foundational Component Area description for Life and Physical Sciences. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

The proposed course must contain all elements of the Foundational Component Area. How does the proposed course specifically address the Foundational Component Area definition above?

This course is designed to give an intuitive understanding of the Big Bang and Black Holes, without mathematics, and de-mystify it for non-scientists. The primary goal is for students to use critical thinking about the origin and evolution of the universe and communicate their understanding using their own words to a lay audience. They will use deductive and empirical reasoning to do evidence based-decision making.

Core Objectives

Describe how the proposed course develops the required core objectives below by indicating how each learning objective will be addressed, what specific strategies will be used for each objective and how student learning of each objective will be evaluated.

The proposed course is required to contain each element of the Core Objective.

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

Before lecture students are required to do the reading and ask critical questions before the lecture period. This naturally aids in the synthesis of material. They then bring those questions to class, where the normal lecture period time is done in a manner of Interactive Engagement, including iClicker questions and synthesis of information. Their primary assignments are short, written documents which require them to synthesize information into a succinct summary in lay language and explain their decision making pedagogy.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):

Students communicate a number of ways throughout the course. In particular, they are required to write multiple papers in a way that they must communicate modern scientific information in lay language. They must interpret data through graph during the reading, and there are many times during the lecture time where they must discuss their thoughts with peers during clicker question times.

Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

The students must bring in empirical data and observational facts to explain their evidence-based reasoning in their course in the context of established scientific theories such as Quantum Mechanics and
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Initial Request for a Course Addition to the Fall 2014 Core Curriculum

General Relativity.

Teamwork (to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal):

The team work portion of the course activities are designed to mimic how undergraduate, graduate, postdoctoral and faculty interact in a research environment as a team. This is done in two ways: To discuss the issues, and to work together on the production of a scientific document.

Discussion teamwork: To facilitate discussion between students on science issues as is done in a typical research team, pairs of students are given a conceptual question (in class) and they are to discuss and work together to understand the question and determine the correct answer. They are required to discuss verbally as a two or three person team, but (for evaluation purposes: enter their own answer during lecture with a iClicker. Often these discussion involve discussions with the lecturer for clarification and hints. Thus, like in real research teams they probe the ideas to arrive at a common, and correct understanding.

Written teamwork: As much of science is done in written fashion, where much of the learning comes during the iteration process, a central part of the course is in writing. As is often done in science, especially in physics and astronomy, a typical paper is done where multiple authors collaborate on a single document, but with a lead author and collaborating authors. In this course we include writing assignments where each student interacts and collaborates, in written fashion, with multiple reviewers. While this is not done in person (although that option is available as students draft their original paper), each student writes their own paper and submits it to the Calibrated Peer Review (CPR) system (http://people.physics.tamu.edu/toback/109/WritingAssignments/Why_use_CPR.pdf). This system facilitates the process of teaching students how to evaluate documents using example papers and rubrics.

After training for each assignment, each student provides written commentary on the work of others, and is typically expected to incorporate written commentary into their own work. In particular, they give and receive feedback from their peers on their writing assignments and use this feedback for revisions to improve their writing communication skills. As in any building up of competent team members, students are evaluated on the quality of their writing, how well the assess the quality of a document, and how well they provide useful feedback to others. As a side benefit, they learn how to incorporate the value of team work by learning to be a better team member to themselves.

In this context, the discussion-in-class activity supports teamwork directly as students verbally discuss different points of view and work effectively with others to support a shared purpose/goal. Similarly, the team-activity of providing written feedback to team members (and incorporating feedback from others) builds better teamwork skills as students development of excellent papers. Indeed, giving and using written feedback as part of a team further gives the opportunity to give and receive different points of view and to learn the difficult skill of effectively incorporating feedback from team members into a document.

Please be aware that instructors should be prepared to submit samples/examples of student work as part of the future course recertification process.
ASTR/PHYS 109: Big Bang and Black Holes

Fall 2013

Course objectives: This course is designed to give an intuitive understanding of the Big Bang and Black Holes, without mathematics, and de-mystify it for non-scientists. The primary goal is for students to use critical thinking about the origin and evolution of the universe and communicate their understanding using their own words to a lay audience. They will use deductive and empirical reasoning to do evidence based-decision making.

Prerequisites: None

Instructor: Prof. David Toback
Office: Mitchell Institute (MIST), Room M425
Email: toback@tamu.edu
Course website: http://faculty.physics.tamu.edu/toback/109

Textbook: “Big Bang, Black Holes, No Math,” by Toback (Web download)
Recommended books:
“A Briefer History of Time,” by Hawking and Mlodinow
“Theory of Everything,” by Hawking
“Stephen Hawkings’s Universe,” by Filkin
“The First Three Minutes,” by Weinberg
Other readings to be downloaded from the web

Course Work and Grading: The bulk of the grade for this course is in the writing component. A premium will be placed on the ability to understand and convey the excitement about science, cosmology and the physical universe to the lay reader. Note that you cannot pass the course without completing all the assignments. Some portions of the assignments will be pass/fail, and there will be a few assignments where you will be required to pass in order to pass the course. By percentage, the grade is based on:

- Short papers: 90%
- In-class quizzes/pre-lecture reading questions: 5%
- End-of-Chapter online quizzes: 5%

Answer to frequently asked questions about grading can be found at http://people.physics.tamu.edu/toback/109/109FAQ.shtml

Students in the Honors Sections: The regular sections and honors section meet together during the regular class period. However, each honors student will have an additional Research Paper that will be part of their paper grade. More information about it can be found at http://faculty.physics.tamu.edu/toback/109/honors.shtml

Description of the writing instruction: Each paper assignment will submitted online and graded using the Calibrated Peer Review system (cpr.tamu.edu) which we will refer to as CPR. Many students find using CPR to be the most difficult and unpleasant portion of the course. The instructor believes reviewing papers, as a way of learning to critique your own work, is the most
important part of the class and one of the best ways to improve your writing. We will spend time discussing each paper in class.

We are here to help you get excellent grades if you will put in the time and effort required. Before each paper is due, students will be encouraged to submit drafts to the TA for feedback with enough time for the TA to respond with comments. This will help produce an excellent final draft paper. Getting help from the TA’s during both the writing and the Calibration stages of CPR will be encouraged. In the case that you don’t get the grade you want on the full paper score, you will be encouraged to resubmit your paper. However, doing so requires doing the full the CPR process again. In general, we will take the average of the two scores as long as the first draft shows a "good-faith" effort. Exceptions will be made in rare cases.

Since many students are not used to working with the CPR system, the first paper will be graded pass/fail. A student must pass both the text portion as well as the Calibration stages in order to pass the assignment. Students will be required to resubmit the first paper until they receive a passing grade in order to pass the course.

**ADA Policy:** The American's 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 the Department of Disability Services in Cain Hall B118, call 845-1637, or e-mail disability@tamu.edu. Additional information is available at http://disability.tamu.edu.

**Honor Code:** The Aggie Honor Code states, "An Aggie does not lie, cheat, or steal or tolerate those who do." Further information regarding the Honor Council Rules and Procedures may be found on the web at http://www.tamu.edu/aggiehonor. The plagiarism statement for the course can be found at http://faculty.physics.tamu.edu/toback/109/WritingAssignments/plagiarism.shtml

**50-Word Summary:** This course is designed to give an intuitive understanding of the Big Bang and Black Holes, without mathematics, and de-mystify it for non-scientists.
Texas A&M University
Core Curriculum Cover Sheet
Initial Request for a course to be considered for the Fall 2014 Core Curriculum

1. This request is submitted by (department name): Poultry Science

2. Course prefix and number: POSC 201

3. Texas Common Course Number: AGRI 1327

4. Complete course title: General Avian Science

5. Semester credit hours: 3

6. This request is for consideration in the following Foundational Component Area:
   - ☑ Communication
   - ☑ Life and Physical Sciences
   - ☐ Creative Arts
   - ☐ American History
   - ☐ Government/Political Science
   - ☐ Social and Behavioral Sciences
   - Current Core: No

7. This course should also be considered for International and Cultural Diversity (ICD) designation:
   - ☑ Yes
   - ☐ No

8. How frequently will the class be offered? Fall and Spring

9. Number of class sections per semester: 3 (2 regular lectures and 1 web based)

10. Number of students per semester: 186 average per semester

11. Historic annual enrollment for the last three years:
    - 2011-12: 390 students
    - 2010-11: 353 students
    - 2009-10: 313 students

This completed form must be attached to a course syllabus that sufficiently and specifically details the appropriate core objectives through multiple lectures, outside activities, assignments, etc. Representative from department submitting request should be in attendance when considered by the Core Curriculum Council.

12. Submitted by: [Signature]
    Date: 5/24/13

    Course Instructor

    Approvals:
    [Signature]
    Date: 5/24/2013
    Department Head

    [Signature]
    Date: 6/3/2013
    College Dean/Designee

For additional information regarding core curriculum, visit the Texas Higher Education Coordinating Board website at www.thecb.state.tx.us/corecurriculum2014

See form instructions for submission/approval process.
Texas A&M University

Core Curriculum

Initial Request for a Course Addition to the Fall 2014 Core Curriculum

Foundational Component Area: Life and Physical Sciences

In the box below, describe how this course meets the Foundational Component Area description for Life and Physical Sciences. Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

How does the proposed course specifically address the Foundational Component Area definition above?

POSC 201 General Avian Science surveys the basic biology of avian species (anatomy, physiology, basic genetics), environmental sciences (feed source, water, light, temperature, atmosphere, nutrient elements) and disease and health factors that potentially impact the growth, development, fertility and productivity of wild and commercial poultry. Each topic begins with the fundamental scientific basis of the topic and, when appropriate, discusses the scientific method used to develop conclusions. Subsequent discussion, then follows to assess the impacts on avian species and practical application to enhance commercial production efficiency.

Core Objectives

Describe how the proposed course develops the required core objectives below by indicating how each learning objective will be addressed, what specific strategies will be used for each objective and how student learning of each objective will be evaluated.

Critical Thinking (to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information):

How Addressed
Students will develop critical thinking skills through integration of “structure-function” relationships, “anatomy/physiology-bird relationships”, “environment-performance” interactions, or deduction of effects from disease pathogenicity.

Strategies
Each topic will begin with discussion of the scientific background, followed by how this relates to biological effects and ultimately bird performance and health. Practical applications then follow. Examples would be:
Lectures on anatomy would begin with the description of system functionality such as functions of the avian digestive tract, which will be followed by a lecture on nutrient digestion, absorption, and utilization. Class discussion would focus on the specific requirements and purposes for specific nutrients such as carbohydrates and amino acids and how different birds, species and strains have different requirement based growth expectations and egg production followed by discussion of dietary formulations for different birds strains. These in-class discussions are used to stimulate critical thinking a med at stimulating thoughts associated with inclusion/exclusion of dietary nutrients and what possible deficiencies might result. The lectures progress through the semester and each new topic builds on the previous allowing the student to evaluate environmental/nutritional/genetic effects on physiology and ultimately production performance.

How evaluated
Each exam will have questions formulated to test for the student’s ability to answer these types of questions.

Communication (to include effective development, interpretation and expression of ideas through written, oral and visual communication):
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How addressed
Active learning is used throughout the course, which includes classroom discussion with students. Students are provided questions or scenarios during the lecture followed by student discussion of the question/scenarios posed during the same lecture session and covering information that has just been provided.

Strategies
Students will be given real-world scenarios and questions throughout most lectures, which will be discussed during the lecture. Questions about current and perhaps controversial issues will be used to stimulate student thought, to reflect on the topic and reach a conclusion or stance. An example might be to consider “The impact of rearing conditions (free range vs convention) on avian health, well being, behavior, and production performance?” These questions typically cover information that is currently being discussed in the media such as animal rights, avian influenza, nutritional value of products produced under different rearing systems and the future of animal production systems. This has been an effective approach to stimulate students to express their thoughts and opinions and enables them to apply newly acquired knowledge to real world situations.

How evaluated
To ensure each student can independently express ideas, exams will include a discussion format evaluating the student’s ability to express concepts and personal views in writing. The student is not graded on the opinion portion of the answer, but rather was the information provided correct and clear.

Empirical and Quantitative Skills (to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions):

How addressed
The scientific basis of poultry science lends itself to quantitative or qualitative analysis. An example would be deductive reasoning to diagnose causal abiotic and biotic stress on avian health and performance.

Strategies
Students will develop basic quantitative skills in areas such as environmental and nutritional inputs on avian physiology and performance. Practical application may include mathematically calculating production and/or feed cost, egg production, and feed consumption. Students will use reasoning to identify potential nutrient deficiencies based on avian species and strain type.

How evaluated
Exam questions will be formulated to test the students ability solve problems, such as determining feed conversion ratio and egg production data from given scenarios.

Teamwork (to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal):

How addressed
The major pedagogical approach used in lecture includes active learning exercises with students. Real world scenarios will be used to initiate group discussions and allow immediate application of knowledge.

Strategies
Students will participate in group learning exercises, such as evaluating production in different rearing conditions given real world scenarios, determine observed genotypes given differing genetic mating’s, etc. Following these group
Course Syllabus
General Avian Science
POSC 201

Instructor: Jason Lee
103A Kleberg
845-1654
jlee@poultry.tamu.edu
Office hours by appointment

Class schedule: TR 9:35 – 10:50 AM Kleberg 117

Teaching Assistants: Mallori Williams mpw032007@tamu.edu
Joseph Klein joeklein07@tamu.edu

Course Description: Introduction to the poultry industry to include past, present and future
industry dynamics; avian anatomy/physiology as they impact commercial production;
management principals and practices of breeding, incubation, brooding, nutrition, disease control,
and marketing technology

Course Learning Outcomes: At the completion of the course, each student will be able to
summarize the complete structure of the three segments of the commercially poultry industry,
define anatomy functions, describe current management practices to include housing, nutrition,
reproduction, and disease management.

Core Objectives: Students in the course will be exposed to the following core objectives; Critical
thinking, Communication, Empirical and Quantitative Skills, and Teamwork. Topics will outline
the scientific background relating biological effects to avian health and production (critical
thinking). Students will participate in classroom discussions that address current events covered
in the media (communication). Empirical and quantitative skills will be evaluated by calculating
production rates, ingredient inclusion rates, and feed efficiency ratios. Teamwork will be
evaluated as small groups students will be given real world scenarios and asked to evaluate the
situation and then lead a class discussion over given scenario.

Text: Poultry Science 4th ed. by Scanes, Brant, and Ensminger will be used as a source for
supplemental reading by not as a mandatory text. Lecturer notes will be provided by the
instructor, and will constitute the material you are held responsible for on exams.
Notes: Note packets are available at Copy Corner. Powerpoint slides will be available on
elearning.

Grading Policy: A = 89.0 –100, B = 79.0 – 89.4, C = 69.0 – 79.4, D = 59.0 – 69.4, F < 59.0

Exams: There will be three written, one hour exams and a comprehensive, final exam. These tests
will consist of multiple choice, short answer, and essay type questions. The instructor reserves
the right to alter this policy at any time.

Quizzes: In addition to tests, there will be 5 quizzes given throughout the semester each worth
20 points. The combined grade on these quizzes (a total of 100 points) will be used in the
calculation of your final grade, but only if it helps your grade. They will not penalize you.
Quizzes will be given via elearning.tamu.edu and will be available for you to take for a three to
day period once they are announced in class.
For example: A student that has test grades of 88, 91, 85, and 88 would have an average of 88 and earn a B for the course. The same student had quiz grades of 16, 20, 20, 20, and 20 for a total of 96. Since the quiz total was higher than the test average, it would be used to calculate the course average (88, 91, $\$5, 88, and 96(quiz total)) for an average of 89.6 earning the student an A for the course.

Guest Speakers
There is a possibility of having some guest lectures throughout the semester. If there is a guest speaker, there will be a question on the exam about the information discussed.

Academic Integrity Statement
"An Aggie does not lie, cheat, or steal or tolerate those who do."
Students can refer to [http://www.tamu.edu/aggiehonor](http://www.tamu.edu/aggiehonor) for more information regarding the Aggie Honor Code.

Each test will include a statement stating:

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

_______________________________
Signature of student

Academic Dishonesty: Students are expected to be the sole source for any work submitted in their name. The utilization or submission of work of others is a violation of Texas A&M University scholastic dishonesty policies and disciplinary steps will be taken. Only authorized electronic or printed materials or equipment may be used in or near the classroom. As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research and knowledge cannot be safely communicated.

If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section “Scholastic Dishonesty.”

Texas A&M Services for Students with Disabilities: (845-1637) 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. Please contact the Department of Student Life, Services for Students with disabilities in Rm 126 of the Koldus Bldg, if you believe you have a disability requiring an accommodation, either temporary or permanent.

**Tentative Test Schedule**

<table>
<thead>
<tr>
<th>Test 1: February 21st</th>
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<tbody>
<tr>
<td>Test 2: March 26th</td>
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<tr>
<td>Test 3: April 25th</td>
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<td>Final: Friday May 3rd</td>
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**Tentative On-line Quiz Schedule**

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<tr>
<th>Feb. 5th - 8th</th>
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<tr>
<td>March 5th - 8th</td>
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<tr>
<td>March 19th - 22nd</td>
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<tr>
<td>April 2nd - 5th</td>
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<tr>
<td>April 16th - 19th</td>
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</tbody>
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CLASS AND TEST SCHEDULE ARE SUBJECT TO CHANGE. IF A CHANGE HAS TO BE MADE, STUDENTS WILL BE NOTIFIED VIA EMAIL AS SOON AS POSSIBLE. IF A TEST DATE IS TO BE CHANGE, A MINIMUM OF 1 WEEK NOTICE WILL BE PROVIDED.
Course Schedule
Lecture 1 – Syllabus and Course Overview
Lecture 1 - 4
   Chapter 1 - History and Development of commercial Poultry Industry in the US
   • Broiler
   • Turkey
   • Egg Production

Lecture 5-12
Chapter 2 – Biological Systems of Birds
   • Lecture 5 - Skeletal and Muscle
   • Lecture 6 – Respiratory and Urinary
   • Lecture 7 – Integument and Circulatory
   • Lecture 8 - Digestive
   • Lecture 9 - Nervous
   • Lecture 10 - Endocrine
   • Lecture 11 and 12 - Reproductive

Lecture 13 and 14
Chapter 3 – Poultry Breeding
   • Qualitative genetics
   • Quantitative genetics
   • Sex linked genes

Lecture 15 and 16
Chapter 4 – Incubation and Hatchery Management
   • Factors effecting fertility and hatchability
   • Natural and Artificial Incubation
   • Single and Multistage Incubators
   • Hatchery Services

Lecture 17 and 18
Chapter 5 – Brooding and Rearing Management
   • Broilers
   • Layers
   • Turkeys
   • Breeders

Lecture 19
Chapter 6 – Poultry Housing and Equipment
   • Positive/Negative Air Pressure Systems

Lecture 20 and 21
Chapter 7 – Poultry Diseases
   • Biosecurity
   • Respiratory Diseases – Viral, Bacterial, and fungal
   • Tumor causing diseases
   • Protozoan
   • Bacterial
   • Viral