Instructor: Dr. Kurtis A. Williams, Assistant Professor
Office Location: 145 Science Building
Office Phone: 903-886-5516
Office Fax: 903-886-5480

Office Hours: M 9:30–10:30, W 1:30-2:30, Th 3:00–3:50, or by appointment
University Email Address: Kurtis.Williams@tamuc.edu
Course Location and Time: 122 Science, MWF 11:00 a.m. – 11:50 a.m.

COURSE INFORMATION

Course Description:
This is a one-semester survey of cosmic catastrophes, or energetic phenomena that could pose a serious threat to humanity. We will also learn some of the physics and mathematics needed to explain these phenomena. We will therefore need to use high-school level mathematics, including algebra and geometry.

We will be using a variety of learning techniques in the course in addition to lectures, including in-class activities, online activities and homework, and individual reading. Your active participation in all aspects of the course will not only enhance your understanding of the material, but also help your grade.

Prerequisites: Astr 1411 or 1412 (formerly 101 and 102), and one of Math 179, 1314, 1324, or 2413, or instructor’s approval.

Student Learning Outcomes:
1. You will apply conservation laws to predict astrophysical phenomena.
2. You will recognize the impact of high-energy phenomena upon the evolution of the Universe.
3. You will assess astrophysical threats to the Earth and potential mitigation.
4. You will present current astronomical research in written, visual, and verbal format to an audience of your peers.
Materials – Textbooks, Readings, Supplementary Readings:

**Texts Required:**


**Recommended texts:**

- Death From The Skies!, Phillip Plait, Penguin
- A recent introductory astronomy book covering at least stars and galaxies. Examples include:
  - The Cosmic Perspective, 6th edition, Bennett et al., Addison Wesley

**Required Equipment:**

You will need to have access to a scientific calculator that is not part of your smart phone. Graphing functions are not required. For example, Walmart.com has a TI-30X IIS for $13 that is sufficient.

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**COURSE REQUIREMENTS**

**Instructional / Methods / Activities Assessments**

### Attendance and Classroom Participation

The lectures in this course may be significantly different than those in many courses you have taken. I feel that there is only so much a student can learn from a lecture, no matter how entertaining I may be. At some point, you need to take the knowledge, work with it, and make it your own. Therefore, each lecture will actually contain two or three mini-lectures interspersed with various short interactive activities. Your attendance and participation will be key to your success in understanding the material.

For these reasons, attendance and class participation are mandatory and will count toward your final grade. I realize that most of you are not comfortable speaking up in front of a large group of people, so class participation will come in a variety of forms, including interactive polling, small group discussions, and short in-class writing assignments. These in-class activities are graded only on whether you make an effort to participate, not on whether or not you get the correct answer.

Attendance and participation grades are calculated as follows. You may miss up to three lectures with no penalty – no excuses are needed. Beyond this, there are no excused absences. Tardiness, leaving class early, disruptive behavior, or failure to participate may be counted as an absence at the instructor’s discretion. Your participation grade is simply the total number of classes attended (plus any excused absences) divided by the total number of classes.

**Advanced Mathematics**

This class includes a wide range of students. Some of you are physics majors, many of you are not. In order to teach at a level where everyone can learn, most lectures will be pitched at a level appropriate for everyone. However, every once in a while I will have a “derivation diversion” that will delve into the mathematics more deeply for the physics majors and may include some calculus. I will clearly delineate these portions of the lecture. Material covered in these lectures will be required for physics majors but not
for others. However, I do ask that everyone stick around in these parts of the lecture and attempt to follow along.

Homeworks and exams will contain a few clearly labeled “advanced problems” that will use the material covered in the advanced classes. Again, these problems will be required for science majors, but not for everyone else.

**Homework and Reading Assignments**

**At-home reading** will be assigned often. This reading is very important to your success in the class. The reading will refresh your memory on topics you've covered in previous astronomy courses and introduce some new material. In-class lectures will assume you've done the reading and have a basic understanding of the topics.

**Homework** will be assigned often. I’ll make sure the due dates are clearly specified. **Late homewor**ks will be penalized by 15% per day late, up to a maximum of 70%. Your lowest homework score will be dropped.

**Exams**

Two exams will be given during the semester, one in class on Friday, March 1, and the other during the final exam slot on Wed, May 8. During the exam, you may use a 1-page cheat sheet and a scientific calculator. No other aids will be permitted.

**Research Projects**

During the semester, you will do two research projects on topics covered in the class. Peer grading will be part of your grade.

First project:
- A poster to be presented in class the week of March 4
- A written report due on Friday, March 8

Second project:
- An in-class presentation the week of April 29
- A written report due Friday, May 3

**Grading**

Grading will be done on an absolute scale with no “curves” and no competition. If you all earn A’s, you all get A’s. Your current grades will be available online through a website called “JupiterGrades” during the course of the semester so you can see how you are doing. **NO extra credit is available.**

The grading breakdown is as follows:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>30%</td>
</tr>
<tr>
<td>Exams</td>
<td>30% (15% each)</td>
</tr>
<tr>
<td>Research Projects</td>
<td>30% (15% each)</td>
</tr>
<tr>
<td>Attendance / Participation</td>
<td>10%</td>
</tr>
</tbody>
</table>
The grading scale is:

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% to 100%</td>
<td>A</td>
</tr>
<tr>
<td>80% to 89.9%</td>
<td>B</td>
</tr>
<tr>
<td>70% to 79.9%</td>
<td>C</td>
</tr>
<tr>
<td>60% to 69.9%</td>
<td>D</td>
</tr>
<tr>
<td>Below 60%</td>
<td>F</td>
</tr>
</tbody>
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TECHNOLOGY REQUIREMENTS

This course will be a web-enhanced course and will use online materials, including eCollege. In order to use the web enhancements, you will need an Internet access/connection – high speed recommended (not dial-up). Additionally, the following hardware and software are necessary to use eCollege:

- Our campus is optimized to work in a Microsoft Windows environment. This means our courses work best if you are using a Windows operating system (XP or newer) and a recent version of Microsoft Internet Explorer (6.0, 7.0, or 8.0).
- Your courses will also work with Macintosh OS X along with a recent version of Safari 2.0 or better. Along with Internet Explorer and Safari, eCollege also supports the Firefox browser (3.0) on both Windows and Mac operating systems.
- It is strongly recommended that you perform a “Browser Test” prior to the start of your course. To launch a browser test, log in to eCollege, click on the ‘myCourses’ tab, and then select the “Browser Test” link under Support Services.

ACCESS AND NAVIGATION

Some class materials such as lecture notes will be made available through eCollege, the Learning Management System used by Texas A&M University - Commerce. To access these materials, go to: https://leo.tamu-commerce.edu/login.aspx. You will need your CWID and password to log in. If you do not know your CWID or have forgotten your password, contact Technology Services at 903-468-6000 or helpdesk@tamuc.edu

I have set up a course Twitter account, @prof_kwilliams (http://twitter.com/prof_kwilliams) primarily for the purposes of important communications and reminders about due dates and exams. Tweets relevant to this class will be preceded by the tag #astr337.

COMMUNICATION AND SUPPORT

Interaction with Instructor Statement:

Office: It’s important to realize that office hours are not just for students who are having problems in the course. Feel free to come by to clear your thinking about the course material, to get pointers for additional reading or activities, to ask about career opportunities, or even to ask questions about material that we aren’t covering in class. If you feel uncertain about anything, please come by before your small problems grow into big ones.

You may feel free to stop by my office any time my door is open, but if you do not have an
appointment and if it is not my scheduled office hours, please understand if I’m not free to talk at that instant.

Email: I can be reached by email at Kurtis.Williams@tamuc.edu. Please allow up to 24 hours for a response (48 hours on the weekend or holidays). Because of privacy rules, I cannot always discuss grades via email.

Twitter: The Twitter feed is used exclusively for outgoing messages; I will not monitor the feed for responses or direct messages.

Netiquette:
I expect all students to behave to basic standards of etiquette on the web (and in real life). Abusive or inappropriate comments will be removed and earn a reprimand; any additional lapses could result in disciplinary action. For a simple guide to netiquette, see http://www.albion.com/netiquette/corerules.html

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures:

Classroom behavior: I ask you to follow some simple good manners that will make class time much more productive for you and your fellow students. During class: Please do not talk to your fellow students except during interactive activities. Please turn off your cell phone ringer during class. Please do not answer your cell phone (if you must, please leave the classroom to do this). Please do not send or view texts, tweets, emails, photos, etc. during class. Please do not surf the internet or use any other apps or programs on laptops or computers (note-taking or other course-related work is okay). Please do not listen to iPods, MP3 players, Pandora, Sony Walkmen, Vuvuzelas, or any other type of noise-making device. Please don’t read the newspaper. In short, please just pay attention to what’s going on and don’t bother other people.

Academic integrity: A major goal of this and most every university course is for you to learn and appreciate subject material. Academic dishonesty (“cheating”) actively prevents you from achieving this goal. Academic dishonesty is taken seriously by the University and by me, and will not be tolerated. (See the TAMU-C Code of Student Conduct and the TAMU-C Procedures A 13.04, 13.12, 13.31, and 13.32.)

This conduct is not only considered wrong in this course and at this University, but also in the real world. Engaging in these activities will get you fired from a job and prevent you from getting another job.

Unethical student conduct includes:

• Plagiarism, or copying the words of others with the intent of making it look like your own. Whether you use someone else’s phrase word for word, or whether you try and change a few words, or even if you just borrow someone else’s original idea and don’t give them credit, it’s wrong. Give credit to wherever you got an idea, and put direct quotes inside quotation marks.

• Cheating involves trying to trick me or others into thinking you did work that you really didn’t do, or into thinking you know what you really don’t know. This can include stealing exams, changing your answers on a graded exam or assignment and claiming it was graded wrongly, putting your name on someone else’s homework,
and so on. Searching the Internet for detailed solutions to homework or exam questions should be considered cheating. Using the internet for help with homework is usually acceptable. *If in doubt, ask.*

- **Collusion** is working with another person to cheat. This can include copying someone else’s answers to an exam or assignment, doing work for another student, buying or otherwise obtaining homework/exam solutions online, or any other instance of multiple people engaging in some form of cheating or dishonesty. **Working with other students on an assignment is fine IF everyone contributes and each student does their own work.**

- **Any other activity that, to a reasonable person, looks wrong.** If you have any doubt whatsoever whether a certain action is considered dishonest, please ask me *before* engaging in the activity. There is no need to be embarrassed about asking!

*If you engage in academic dishonesty during any graded activity, you will receive no credit for that activity. More than one instance of dishonesty by a student will result in automatic failure of the course and referral of the student for disciplinary action.*

For further information, search the Texas A&M-Commerce website for “academic integrity policy”.

**University Specific Procedures:**

**ADA 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 have a disability requiring an accommodation, please contact:

**Office of Student Disability Resources and Services**

Texas A&M University-Commerce  
Gee Library 132  
Phone (903) 886-5150 or (903) 886-5835  
Fax (903) 468-8148  
StudentDisabilityServices@tamuc.edu  
Student Disability Resources & Services

**Student Conduct**

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See *Code of Student Conduct from Student Guide Handbook*).
Here is a list of topics we will cover in this class. The exact dates may vary.

- **Unit 1: Setting the Stage (Jan 14–18)**
  - Cosmic Catastrophes Ch. 1.1 and 1.2
- **Unit 2: Stellar Evolution and Stellar Death (Jan 23–30)**
  - Cosmic Catastrophes Ch 2.3 and Ch 2
  - Death From the Skies! Ch 7
- **Unit 3: Binary Stars (Feb 1–11)**
  - Cosmic Catastrophes Ch 3 and Ch 4
- **Unit 4: White Dwarfs and Cataclysmic Variables (Feb 13–20)**
  - Cosmic Catastrophes Ch 5
- **Unit 5: Supernovae (Feb 22–Mar 8)**
  - Cosmic Catastrophes Ch 6 and Ch 7
  - Death From the Skies! Ch 3
- **Unit 6: Neutron Stars (Mar 18–22)**
  - Cosmic Catastrophes Ch 8.1-8.5
- **Unit 7: Relativity and Black Holes (Mar 25–Apr 5)**
  - Cosmic Catastrophes Ch 9 and Ch 10
  - Death From the Skies! Ch 5
- **Unit 8: Gamma Ray Bursts (Apr 8–12)**
  - Cosmic Catastrophes Ch 11
  - Death From the Skies! Ch 4
- **Unit 9: Supernovae and Cosmology (Apr 15–26)**
  - Cosmic Catastrophes Ch 12
  - Death From the Skies! Ch 9
- **Unit 10: Beyond the Frontiers (If time allows)**
  - Cosmic Catastrophes Ch 13 and Ch 14

**Course Calendar:**

- **Exam 1:** Friday, March 1, in class, Units 1–4
- **Exam 2:** Wednesday, May 8, 10:30–12:30
- **Research Project 1**
  - *Poster Due Date:* Monday, March 4
  - *Report Due Date:* Friday, March 8
- **Research Project 2**
  - *Presentation Due Date:* Monday, April 29
  - *Report Due Date:* Friday, May 3