FUNDAMENTALS OF ASTRONOMY
PHYS 1303, SECTION 010

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CONTACT INFORMATION
Dr. Michael C. Holcomb
Office: VIN 123
Phone: 325.486.6787
Email: michael.holcomb@angelo.edu
Webpage: www.mcholcomb.com/teaching

Office Hours
Monday 10:00am–12:00pm
Tuesday 2:00pm–4:00pm
Wednesday 10:00am–12:00pm
Thursday 2:00pm–4:00pm
Friday 10:00am–12:00pm
Also available by appointment
REQUIRED MATERIALS
- TopHat.com access - Purchase access through the ASU Bookstore.

OPTIONAL MATERIALS
- Starry Night College planetarium software, student version

COURSE OVERVIEW
This course will provide an introduction to the current knowledge and techniques of astronomy and astrophysics. A broad range of topics will be covered; however, the emphasis will be on stellar astronomy and cosmology.

This course is intended to acquaint students with the scientific method and basic tenets of scientific inquiry, to help students develop a better understanding of science in general and develop reasoning skills and strategies to prepare them for other upper-division course work. To this end, the course will emphasize a mix of conceptual understanding and standard end-of-chapter homework solving skills.

Expected Learning Outcomes
The expected learning outcomes for the course, listed below, will be assessed through performance on guided classroom discussions, homework, and embedded questions within exams.

- Recognize science as an iterative process and summarize how astronomical data is acquired and understood.
- Develop scientific reasoning and critical thinking skills that can be applied to life beyond the classroom.
- Identify and describe the features and physical principles relevant to stellar astronomy.

COURSE COMPONENTS
Lecture & Attendance
We will use TopHat this semester during lecture to take attendance, administer quizzes, and complete in-class assignments. TopHat access can be purchased through the ASU Bookstore. Once access has been purchased, you must register yourself at www.Tophat.com.

Use both your legal name and your ASU Campus ID number (ex: 87654321) when setting up your account. The course code is 231228.

Attendance is mandatory and will be taken daily. Attendance will directly contribute to your grade in the course. A spirit of honesty will be maintained in the attendance policy. Note that you are responsible for everything that we do in lecture, so it is to your advantage to attend.
Please thoroughly read the section of this syllabus regarding classroom etiquette for further information on expectations for lecture attendance.

**Lecture Preparation**

You are expected to bring the assigned texts, paper for notes, and a suitable writing utensil (preferably a pencil with an eraser), a scientific calculator, and your ASU Student ID with you to every class meeting. You will likely find it helpful to read ahead in the textbook before each class.

**Homework**

Homework will be assigned and graded weekly. Late homework will only be accepted in the case of extenuating circumstances at the lecturer's discretion. Even though the homework is weighted lightly in your final grade, it is not in any way optional; it is crucial for your understanding of the course material.

**Quizzes and In-Class Assignments (QICA)**

Several times throughout the term you will be asked to complete quizzes and in-class assignments. These can be either individual or team-based exercises and may or may not be announced. No makeup quizzes or in-class assignments will be given.

**Exams**

Three (3) exams consisting of an in-class group portion and Blackboard-based individual portion, will be administered as scheduled. The group portion will be given in our normal classroom. No makeup exams will be given, so please plan accordingly. All exams will be given in our normal classroom. Please see the course calendar for scheduled exam dates and anticipated content.

**Exam Rules**

Calculators only are permitted. All other electronics must be stowed out of sight during exams. Cell phones and smart watches are not considered to be calculators regardless of what apps may have been installed. If you are seen attempting to use an electronic device during
the exam, you will be asked to leave and issued a zero for the exam without exception.

**STRATEGIES FOR SUCCESS**

Be prepared! These tips will help you keep up, make for more productive classroom interaction, and help you be prepared for homework, labs, and exams that make up your semester grade.

- Pay special attention to examples worked in class.
- Study your notes.
- Read the material in the text before we cover it in class.
- Begin all homework assignments as soon as possible. Don’t get behind or wait until just before an exam to begin.
- Make use of the free in-person and online tutoring services available through the Tutoring Center.
- Supplemental Instruction (SI) sessions for some classes are offered through the campus Tutoring Center. These sessions can help you review difficult concepts as a group.
- If you are stuck, come by my office with questions during office hours or make an appointment to meet at another time.
- Once you can work through a problem with your notes, book, study group, etc., be sure you can rework it entirely on your own.
- Don’t “blow off” any exam just because there is a dropped score. The purpose of the dropped score is in case of illness or other extenuating circumstances.

**GRADING POLICIES**

The following scores will be recorded during the course of the semester: Attendance, Homework, QICA, Exam 1, Exam 2, Exam 3, Final Exam. The course grade will be the weighted average of Attendance at 10%, Homework at 10%, QICA at 20% and Exams at 15% each.

**How your final course grade is weighted:**

There are no makeup exams; however, the final exam score can replace the lowest midterm. In other words, the four highest scores from Exam 1, Exam 2, Exam 3, Final Exam, and Final Exam will be considered for the course grade.

Your letter grade will be determined on the following scale: F (≤59), D (60-69), C (70-79), B (80-89), A (90-100).

**Incomplete Grade Policy**

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information.
CLASSROOM ETIQUETTE

Attending lecture is mandatory. You are considered both advised and responsible for anything discussed during lecture. **No food or drink will be allowed due to lecture being held in the ASU Planetarium.**

Leaving lecture early or arriving late is considered both rude and distracting and is a safety hazard because of the room’s low light level. As such, doors will be locked once class begins and entry to the planetarium will not be granted once the doors are locked. If you have an expected reason to depart early, please inform the lecturer at the beginning of class, sit in a convenient location for leaving without disturbing the class, and do not attempt to leave unless the planetarium lights have been brought up to a safe level.

All students are expected to be respectful of their peers during lecture by not becoming a distraction. If you become a distraction to other students, then you will be dismissed from class for that day. Some actions, including but not limited to the following, will result in you being considered a distraction to your peers: repeatedly arriving late, reading unrelated material, using your cell phone in any way outside of approved exercises, visiting with your neighbor, sleeping, eating, “vaping,” and the use of any and all tobacco products.

No laptops or any other electronic devices are allowed in class unless the need for such a device for reason of a disability is documented by Student Disability Services.
INCLUSIVE LEARNING ENVIRONMENT  (Adapted from Yale Center for Teaching and Learning)

**Civility and Respect**

Our university supports and wants to foster a civil, respectful, and open-minded climate so that all of us can live and work in an environment free of harassment, bias-motivated behaviors, unfair treatment, and fear. The university expects all members of our community to refrain from actions or behaviors that intimidate, humiliate, or demean persons or groups or that undermine their security or self-esteem based on traits related to race, ethnicity, country of origin, religion, gender identity/expression, sexual orientation, age, or physical or mental ability, including learning and/or developmental disabilities and past/present history of mental disorder or other category protected by state or federal law.

**Accommodations for Students with Disabilities**

Angelo State University is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs. For more information about the application process and requirements, visit the Student Disability Services website at [www.angelo.edu/ada](http://www.angelo.edu/ada).

**Point of Contact**

**Director of Student Disability Services**
Dallas A. Swafford  
Email: [dallas.swafford@angelo.edu](mailto:dallas.swafford@angelo.edu)

**Office**
Houston Harte University Center, Room 112  
Office Email: [ada@angelo.edu](mailto:ada@angelo.edu)  
Office Phone: **325.942.2047**
Title IX at Angelo State University
All community members should enjoy an environment free of any form of harassment, sexual misconduct, discrimination, or intimate partner violence. The university prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking.

Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator You may also file a report online 24/7 at www.angelo.edu/incident-form.

For more information about resources related to sexual misconduct, Title IX, or Angelo State’s policy please visit: www.angelo.edu/title-ix.

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Note from Dr. Holcomb: As a faculty member at Angelo State, I am a mandatory reporter and am obligated to report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325.942.2371), the 24-Hour Crisis Helpline (325.486.6345), or the University Health Clinic (325.942.2171).

Point of Contact
Director of Title IX Compliance and Title IX Coordinator
Michelle Boone, J.D.
Email: michelle.boone@angelo.edu
Office
Mayer Administration Building, Room 210
Office Phone: 325.942.2022
Report an incident: www.angelo.edu/incident-form
Student Absence for Observance of Religious Holy Days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information.

ACADEMIC INTEGRITY

Academic integrity is a core institutional value at Angelo State University. It means, among other things, truth in presentation, diligence and precision in citing works and ideas we have used, and acknowledging our collaborations with others. In view of our commitment to maintaining the highest standards of academic integrity, the ASU Code of Conduct and Academic Integrity policy specifically prohibits the following forms of behavior:

• cheating on examinations, problem sets and all other forms of assessment;
• falsification and/or fabrication of data;
• plagiarism, that is, the failure in a dissertation, essay or other written exercise to acknowledge ideas, research, or language taken from others;
• multiple submissions of the same work without obtaining explicit written permission from both instructors before the material is submitted.

This is not an exhaustive list of prohibited behaviors. I encourage each of you to read the Code of Conduct and Academic Integrity policy in full for more information. The College of Science and Engineering adheres to the university's Statement of Academic Integrity.

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from Angelo State University.

Plagiarism

Plagiarism is a serious topic covered in ASU's Code of Conduct and Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and representing it as one's own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas, giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality. Resources to help you better understand this policy better are available at the ASU Writing Center.

Copyright Policy

Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.
Our tentative course calendar is below. I reserve the right to change this calendar as needed; however, I will inform you in class and via email in advance of any changes.

Remember to check our Blackboard class page regularly for assigned readings and homework. Also remember to check your university email (RamMail) account regularly for class updates and other important university correspondence.

<table>
<thead>
<tr>
<th>Week of</th>
<th>Events</th>
<th>Lecture Topic</th>
<th>Chapter</th>
</tr>
</thead>
</table>
| Jan 13  | Monday, Jan 13: First class meeting  
Thursday, Jan 16: Last day to make schedule changes for this term | Science and the Universe | 1 |
| Jan 20  | Monday, Jan 20: No Class (Martin Luther King Jr. Day) | The Birth of Astronomy | 2 |
| Jan 27  | Thursday, Jan 30: Drops and withdrawals will now be recorded on transcripts | Orbits and Gravity | 3 |
| Feb 03  | | Radiation and Spectra / Astronomical Instruments | 5, 6 |
| Feb 10  | EXAM 1 (Ch. 1-6) Thursday, Feb 13 – group portion during class  
Sunday, Feb 16 – individual deadline (Blackboard) | Analyzing Starlight / A Celestial Census | 17, 18 |
| Feb 17  | | A Celestial Census / Celestial Distances | 18, 19 |
| Feb 24  | | The Sun | 15, 16 |
| Mar 02  | EXAM 2 (Ch. 15–19) Thursday, Mar 05 – group portion during class  
Sunday, Mar 08 – individual deadline (Blackboard) | Between the Stars | 20 |
| Mar 09  | No Classes (Spring Break) | | |
| Mar 16  | | The Birth of Stars | 21 |
| Mar 23  | Thursday, Mar 26: Last day to drop or withdraw for this term | Stars from Adolescence to Old Age | 22 |
| Mar 30  | | The Death of Stars, Black Holes, & Curved Spacetime | 23, 24 |
| Apr 06  | | Galaxies | 26 |
| Apr 13  | EXAM 3 (Ch. 20–24) Thursday, Apr 16 – group portion during class  
Sunday, Apr 19 – individual deadline (Blackboard) | Active Galaxies, Quasars, & Supermassive Black Holes | 27 |
| Apr 20  | | The Evolution and Distribution of Galaxies | 28 |
| Apr 27  | Monday, Apr 27: Lab finals begin (through May 01)  
Thursday, Apr 30: Last class meeting | The Big Bang / Life in the Universe | 29, 30 |
| FINALS  | Thursday, May 07: FINAL EXAM, 8:00am–10:00am in the ASU Planetarium (VIN P-02) | | |
Online Course Transition Addendum:

*In response to the coronavirus (COVID-19) pandemic, Angelo State University has decided to extend spring break for its students one additional week (March 16-20) and will move all classes online for the remainder of the spring semester. This decision has been made out of continued concern for the health and safety of our faculty, staff, and students.*

For this course (PHYS 1303-010), the transition to online will necessitate the following updates to our syllabus:

**Office Hours:**

I will no longer be offering in-person office hours or appointments in my physical office, VIN 123; however, I will continue to hold regular office hours and offer one-on-one appointments via Blackboard Collaborate.

**Lecture & Participation:**

Lecture will still be offered synchronously. At our regularly scheduled lecture time (TR 0930-1050), I will be offering a verbal lecture via Blackboard Collaborate. All students will have access to log in through the Blackboard course and I will use the screen share feature to present the PowerPoint in place of the projector. This setup will allow us to continue to use TopHat to monitor attendance and provide conceptual checkpoints.

In addition to the synchronous lecture, asynchronous lecture material will be offered for those that cannot log in at the regularly scheduled time. A recording of the synchronous lecture and a PDF version of PowerPoint will be available to download and review. The recording will either be offered as a full recording of the lecture or as several shorter segments divided by topic.

My recommendation is that everyone participate in the synchronous lecture and use the asynchronous materials to review and refresh as necessary. Following this recommendation will help to maintain the schedule and feel of the course that you have grown accustomed to; however, I understand that some people may be unable due to personal preference (i.e. learning style), external commitments, or access to technology (i.e. computer, high speed internet, etc.).

**Homework:**

Homework will continue to be assigned and graded through Blackboard as we have previously done.

**Quizzes and In-Class Assignments (QICA):**

The administration of future QICA will be adjusted, as using scratch-off answer sheets will no longer be possible. QICA will now be administered as individual blackboard
assignments that will completed asynchronously. You will be given three (3) attempts on each assignment and your recorded score will be the average of all completed attempts.

**Exams:**

The conceptual portion (originally the individual portion) of our exams will continue to be administered as we have done previously; however, the administration of the quantitative portion (originally the group portion) will change. Moving forward, the quantitative portion will be administered similar to QICA.

**Course Calendar:**

Coverage will be affected by the additional week of spring break and the mandated transition of this course to being administered online. I have updated the course calendar and reserve the right to further adjust the calendar as needed.

<table>
<thead>
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<th>Week of</th>
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<th>Lecture</th>
<th>Chapters</th>
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<td>January 13th</td>
<td>Monday 13th - First Day of Class</td>
<td>Science and the Universe</td>
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<tr>
<td>January 20th</td>
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<td>The Birth of Astronomy</td>
<td>2</td>
</tr>
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<td>Orbits and Gravity</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>February 3rd</td>
<td>Radiation and Spectra / Astronomical Instruments</td>
<td></td>
<td>5, 6</td>
</tr>
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<td>February 10th</td>
<td>EXAM 1 (1-6) Thursday 13th – group portion Sunday 16th – Individual portion deadline</td>
<td>Analyzing Starlight</td>
<td>17</td>
</tr>
<tr>
<td>February 17th</td>
<td>The Sun</td>
<td></td>
<td>15, 16</td>
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<tr>
<td>February 24th</td>
<td>A Celestial Census</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>March 2nd</td>
<td>EXAM 2 (15-19) Thursday 5th – group portion Sunday 8th – Individual portion deadline</td>
<td>Celestial Distances</td>
<td>19</td>
</tr>
<tr>
<td>March 9th</td>
<td>Spring Break</td>
<td></td>
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<tr>
<td>March 16th</td>
<td>Spring Break Extension</td>
<td></td>
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<tr>
<td>March 23rd</td>
<td>Thursday 26th – Last day to Drop</td>
<td>Between the Stars</td>
<td>20</td>
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<td>March 30th</td>
<td>Stars from Adolescence to Old Age</td>
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<td>22</td>
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<tr>
<td>April 6th</td>
<td>The Death of Stars</td>
<td></td>
<td>23</td>
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<tr>
<td>April 13th</td>
<td>EXAM 3 (20-24) Thursday 16th – Sunday 19th</td>
<td>Black Holes, &amp; Curved Spacetime</td>
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<td>April 20th</td>
<td>Galaxies</td>
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</table>

*Final Exam Thursday, May 7th, 08:00am-10:00am --- Remotely Administered Monday 4th – Thursday 7th*