Instructor: Dr. Kenneth Carrell  
Email: kenneth.carrell@angelo.edu  
Phone: (325) 942-2136  
Office: VIN 119  
Office Hours: MW 2-3pm, TR 11am-noon, (or by appointment)

Communication
Faculty will respond to email and/or telephone messages within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until Monday.  
Written communication via email: All private communication will be done exclusively through your ASU email address. Check frequently for announcements and policy changes. In your emails to faculty, include the course name and section number in your subject line.  
Virtual communication: Office hours and/or advising may be done with the assistance of the telephone, Collaborate, Skype, etc.

Course Description
Physics 3371, Astrophysics, is a three credit hour course on the fundamental physical concepts applied to observational and theoretical astronomy. Covered material will include the physical processes occurring in and around stars, details of the stellar life cycle, structure of the universe as a whole, and the latest discoveries and research.

Course Delivery
This is a face-to-face course with online components that students are expected to access in Blackboard.¹

Required Materials

![Foundations of Astrophysics](image)

Foundations of Astrophysics by Ryden & Peterson  

The ASU Bookstore has this for sale, or you can find it at any of the various online stores. Supplemental material will be brought in from a variety of sources other than this text, but this book will provide the rough framework and a good study guide for the course.
Assessing Outcomes & Grade Determination

Method of Assessing Outcomes
Student learning outcomes will be assessed with:

- Daily/weekly work – various homework and in-class assignments will be given throughout the semester.
- Several tests (likely ~3) will be given throughout the semester, either as take-home and/or in-class exams.
- A final exam at the end of the semester.

Late Work

- **Unexcused late work or missed tests will not be accepted.**
- If your assignments are not submitted by the posted deadline or if you miss an in-class test, you will receive a zero for that assignment.
- You must contact your professor **before** the assignment is due if you believe it will be late or as soon as possible after the due date in the case of an unexpected emergency.

Grade Determination

Your final grade will be determined by your scores on all homework, projects, tests and exams, plus any extra credit points earned throughout the semester.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework / Daily Work</td>
<td>40</td>
</tr>
<tr>
<td>Midterm Exams</td>
<td>40</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Angelo State University employs a letter grade system. Grades in this course are determined on a percentage scale: A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = 59% and below

Class Attendance

- Class attendance is both an ASU and course requirement.
- You are expected to attend all scheduled class meetings.
- You are responsible for all course material and information that is presented in class.
- If you miss class, get the class notes and information from a fellow student.
- Attendance (or lack thereof) often makes a difference in your success in this class.

Final course grades will also be determined in part based on attendance as follows:

<table>
<thead>
<tr>
<th>Number of Absences</th>
<th>Highest Grade Possible</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6 (&lt;85% attendance)</td>
<td>A</td>
</tr>
<tr>
<td>7-10 (75-85% attendance)</td>
<td>B</td>
</tr>
<tr>
<td>11-14 (65-75% attendance)</td>
<td>C</td>
</tr>
<tr>
<td>15-19 (55-65% attendance)</td>
<td>D</td>
</tr>
<tr>
<td>20+ (&lt;55% attendance)</td>
<td>F</td>
</tr>
</tbody>
</table>
General Policies Related to This Course

All students are required to follow the policies and procedures presented in these documents:

- Angelo State University Student Handbook
- Angelo State University Catalog

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 ASU.

The College of Science and Engineering adheres to the university’s Statement of Academic Integrity.

Accommodations for Students with Disabilities

ASU 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, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the Student Disability Services website. The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dr. Dallas Swafford
Director of Student Disability Services
Office of Student Affairs
325-942-2047
dallas.swafford@angelo.edu
Houston Harte University Center, Room 112

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.

Plagiarism

Plagiarism is a serious topic covered in ASU’s Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off 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 understand this policy better are available at the ASU Writing Center.
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.

Title IX at Angelo State University
Angelo State University is committed to providing and strengthening an educational, working, and
living environment where students, faculty, staff, and visitors are free from sex discrimination of any
kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus
Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits
discrimination based on sex, which includes pregnancy, and other types of Sexual Misconduct. Sexual
Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination
and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual
sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public
indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any
other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX
Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Miller, J.D. You
may submit reports in the following manner:

Online: Incident Reporting Form
Face to Face: Mayer Administration Building, Room 210
Phone: 325-942-2022
Email: michelle.miller@angelo.edu

Note, as a faculty member at Angelo State, I am a mandatory reporter and must 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).

For more information about resources related to sexual misconduct, Title IX, or Angelo State’s policy
please visit the Title IX website.

Information About COVID-19
Please refer to ASU’s COVID-19 (Coronavirus) Updates web page for current information about
campus guidelines and safety standards as they relate to the COVID-19 pandemic.

Modifications to the Syllabus
This syllabus, including grade evaluation and course schedule, is subject to modification on potentially
short notice based on developing circumstances.
List of Topics and Approximate Scheduling

NOTES:
1) this is subject to change both in topics covered and length of time spent to accommodate class and professor preferences
2) Chapter & section numbers below correspond to required textbook

- **Mathematics of Astronomy (~1 week)**
  - Distances, flux & brightness, magnitudes (Ch 13, Sec 1-2)

- **Interaction of Radiation and Matter (2 weeks)**
  - Atomic structure & processes (Ch 5, Sec 1-2)
  - Emission & absorption spectra (Ch 5, Sec 3)
  - Equation of Radiative Transfer (Ch 5, Sec 4)
  - Local thermodynamic equilibrium (Ch 5, Sec 6)
  - Blackbody radiation (Ch 5, Sec 7)

- **Physical Properties of Stars (1 week)**
  - Stellar temperature, radius, and mass (Ch 13, Sec 3-6)

- **Stellar Atmospheres (1 week)**
  - Hydrostatic equilibrium and classifying stars (Ch 14)

- **Variable Stars (1 week)**
  - Cepheid & RR Lyrae type stars (Ch 17, Sec 3)

- **Star Formation (1 week)**
  - Star formation and evolution of Sun-like stars (Ch 17, Sec 1-2)

- **Stellar Interiors (2 weeks)**
  - Equations of stellar structure (Ch 15, Sec 1)
  - Energy generation in stars (Ch 15, Sec 2-3)

- **Orbital Mechanics (1 week)**
  - Kepler, Newton, and orbits due to gravity (Ch 3)

- **Stellar Remnants (2 weeks)**
  - White dwarfs, neutron stars, & black holes (Ch 18)

- **Everything Else (whatever is left)**
  - Galaxies
    - Classification
    - Spectra
    - Distances
    - Active Galaxies
    - Clusters & Superclusters
  - Cosmology & History of the Universe

**IMPORTANT DATES:**
McDonald Observatory Trip: September 8 – 14
FINAL EXAM: Wednesday December 8 at 10:30 AM