Course Information

Course Description
We will investigate the properties of the real numbers through the Fundamental Theorem of Calculus, starting from a few basic axioms. Content covered will include the real number system, functions, limits, continuity, differentiation, Riemann integration, sequences.

Prerequisite and Co-requisite Courses
Mathematics 2414, 3300

Student Learning Outcomes

- The students will demonstrate an understanding of factual knowledge including the mathematical notation and terminology used in this course. Students will read, interpret, and use the vocabulary, symbolism, and basic definitions used in set theory, function theory, and single variable calculus.
- The students will describe the fundamental principles including the mathematical rules and theorems arising from the concepts covered in this course. Students will identify and apply the results of major theorems including
theorems involving least upper bounds and greatest lower bounds, convergence of sequences, properties of continuous functions, differentiation, and integration.

- **The students will apply course material using with techniques and procedures covered in this course to solve problems.** Students will utilize the facts, concepts, and techniques learned in this course to provide mathematical justification for basic theorems and related examples that form the foundations of calculus.

- **The students will develop specific skills, competencies, and thought processes sufficient to support further study, or work in this field or related fields.** Students will acquire a level of proficiency in basic concepts and techniques necessary for further study in mathematics or for work in occupational fields requiring the application of logical inquiry or mathematical reasoning.

### Course Delivery
The course will be conducted following the principles of the Moore method, modified to allow for small group interaction. Regular face-to-face meetings will consist primarily of student presentations.

### Required Texts and Materials
None.

### Technology Requirements
None.

### 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.
Grading

Evaluation and Grades
Course grades will be determined as indicated in the table below.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percent of Total Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Class Presentations</td>
<td>35</td>
</tr>
<tr>
<td>Written Problems</td>
<td>35</td>
</tr>
<tr>
<td>Exams</td>
<td>35</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>+/- one letter grade.</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Grading System
Course grades will be dependent upon completing course requirements and meeting the student learning outcomes.

The following grading scale is in use for this course:
A = 90.00-100 points
B = 80.00-89.99 points
C = 70.00-79.99 points
D = 60.00-69.99 points
F = 0-59.99 points (Grades are not rounded up)

Assignment and Activity Descriptions
In-Class Presentations: Throughout the semester, each student will be expected to give approximately five in-class presentations of problems. These problems will not be assigned in advance, and the students will be chosen in a random order that ensures an even distribution of problems presented (but not necessarily evenly spaced). If a student is unable to present a problem when it is their turn, they will score a 0 for that presentation. My policy for grading your presentation is roughly as follows:
D = You stood up and made an attempt, but didn’t have anything significant to contribute.
C = You had a prepared argument that was significantly flawed and were unable to resolve those flaws.
B = You had a prepared argument that had some flaws, but were able to correct them with feedback.
A = You presented a good, correct argument.
**Written Problems:** Some problems will be designated as written turn-in problems. These will not be presented on the board, and each student will be expected to work independently to write a proof. These will generally be due one week after they are assigned. As the purpose of this activity is to help you improve your mathematical writing ability, you are not to work in collaboration with your group on these assignments. However, after the work is submitted, graded, and returned, you will have one week to make corrections and resubmit your proof. Your final grade on the problem will be the average of the first turn-in and the rewrite. My policy for grading written work is roughly as follows:

- **A** = You turned in a correct, well-written proof.
- **B** = Your proof is “the right idea”, but some of what you have written is incorrect.
- **C** = You have mistakes in your work, or I do not understand what you have written, but I believe you have a good idea.
- **D** = There is at least one major flaw in your argument.

**Exams:** There will be three exams. Each is designed to ensure that everyone is keeping up with each argument. The goal of the class is that you should be giving well prepared, well presented problems on the board. Students who do so should have no trouble on exams.

**Final Presentation:** In lieu of a final exam we will have a final poster session. Each group will be assigned a topic that extends from our investigation of real analysis, overlapping with the group’s academic interests. These topics will be issued at a later date. The presentations will be peer-evaluated, with guest faculty and students invited to participate and evaluate as well. The final presentation can only adjust your final grade by at most one letter, roughly as follows:

- **+** : You gave an excellent presentation of significant depth, your poster is well-designed, and you were able to easily field questions from your peers.
- **=** : You gave a good presentation and had a good poster.
- **-** : Your presentation was weak, your poster was sloppy, and you were unable to answer any questions.

**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.³

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.⁴ The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

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 Procedures⁵ 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 Boone, J.D. You may submit reports in the following manner:
Online: www.angelo.edu/incident-form
Face to face: Mayer Administration Building, Room 210
Phone: 325-942-2022
Email: michelle.boone@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
For more information about resources related to sexual misconduct, Title IX, or Angelo State’s policy please visit: [www.angelo.edu/title-ix](http://www.angelo.edu/title-ix).

### Course Schedule

<table>
<thead>
<tr>
<th>Week (Starting on Monday)</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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</thead>
<tbody>
<tr>
<td>2: Sept. 2 - Sept. 8</td>
<td>P12 - P15</td>
<td>NO CLASS</td>
<td>P20 - P24</td>
<td>P20 - P24</td>
<td>P24 - P28</td>
</tr>
<tr>
<td>3: Sept. 9 - Sept. 15</td>
<td>P20 - P24</td>
<td>NO CLASS</td>
<td>P24 - P30</td>
<td>P28 - P31</td>
<td>P31 - P34</td>
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<tr>
<td>4: Sept. 16 - Sept. 22</td>
<td>P28 - P31</td>
<td>NO CLASS</td>
<td>Review for E1</td>
<td>Exam 1 (E1)</td>
<td></td>
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<tr>
<td>5: Sept. 23 - Sept. 29</td>
<td>Review for E1</td>
<td>NO CLASS</td>
<td>D12 - P37</td>
<td>P37 - P42</td>
<td>P42 - P42</td>
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<tr>
<td>6: Sept. 30 - Oct. 6</td>
<td>D12 - P37</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td></td>
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<tr>
<td>7: Oct. 7 - Oct. 13</td>
<td>NO CLASS</td>
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<td>NO CLASS</td>
<td>NO CLASS</td>
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<td>8: Oct. 14 - Oct. 20</td>
<td>NO CLASS</td>
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<td>9: Oct. 21 - Oct. 27</td>
<td>NO CLASS</td>
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<td>NO CLASS</td>
<td>NO CLASS</td>
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<tr>
<td>10: Oct. 28 - Nov. 3</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>Exam 2 (E2)</td>
<td></td>
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<td>11: Nov. 4 - Nov. 10</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>P52 - P57</td>
<td>P52 - P57</td>
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<tr>
<td>12: Nov. 11 - Nov. 17</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>P57 - P63</td>
<td>P57 - P63</td>
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<tr>
<td>13: Nov. 18 - Nov. 24</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>P72 - P76</td>
<td>P72 - P76</td>
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<td>14: Nov. 25 - Dec. 1</td>
<td>NO CLASS</td>
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<td>NO CLASS</td>
<td></td>
</tr>
<tr>
<td>15: Dec. 2 - Dec. 8</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td></td>
</tr>
</tbody>
</table>

**END OF CLASSES - BEGINNING OF FINALS WEEK**

| 16: Dec. 9 - Dec. 15 | FINAL: 10:30am-12:30pm | |

Thanksgiving: NO CLASS | Prepare for Final