Math 3415: Calculus III
Course Syllabus

This syllabus is current and accurate as of its posting date, but it will not be updated. For the most complete and up-to-date course information, contact the instructor.

Contact Information

Instructor: Dr. Dennis Hall
Office: MCS 220J
Office Hours: Monday: 9:50am-11:00am and 11:50am-1:00pm
Tuesday: 10:20am-12:30pm
Wednesday: 10:00am-11:00am
Thursday: 10:20am-12:30pm
Friday: 9:50am-11:00am and 11:50am-1:00pm

Note: Office hours are held virtually and in person. During the times listed above, you may visit my office in person or virtually by visiting hall.run/office.

Phone: 325-486-5426

Course Information

Course Description: Calculus of multivariable functions including partial differentiation, multiple integrals, vector functions, line integrals, Green’s Theorem, and Stokes’ Theorem.

Textbook: Calculus, Volume 3, by OpenStax. A free digital version of this textbook is available online at https://openstax.org/details/books/calculus-volume-3. If you prefer a physical copy of this textbook, one may be purchased at the university bookstore.

Course Content: The following chapters and content will be covered.

3. **Vector-Valued Functions**: Vector-Valued Functions and Space Curves, Calculus of Vector-Valued Functions, Arc Length and Curvature, Motion in Space

4. **Differentiation of Functions of Several Variables**: Functions of Several Variables, Limits and Continuity, Partial Derivatives, Tangent Planes and Linear Approximations, The Chain Rules, Directional Derivatives and the Gradient, Maxima/Minima Problems.

5. **Multiple Integration**: Double Integrals over Rectangular Regions, Double Integrals over General Regions, Double Integrals in Polar Coordinates, Triple Integrals, Triple Integrals in Cylindrical and Spherical Coordinates, Changes of Variables in Multiple Integrals.


**Prerequisite Courses**: Mathematics 2415 (Calculus II) or equivalent.

**Course Delivery**: To maintain academic quality while accommodating social distancing needs this semester, this course will use a split delivery model that combines face-to-face teaching with remote instruction.

The goal is to provide face-to-face instruction to students who want to return to campus, while also allowing students who may need to learn remotely to participate via virtual class sessions.

**How Does It Work?**

Your class will be divided, and you will be placed into a smaller group of students to maintain physical distancing requirements in our assigned classroom space.

Your assigned group will receive a schedule of in-person class meetings. This schedule is not flexible. For instance, if you are supposed to attend class on a Monday, you cannot elect to go on Wednesday with another class group instead.

When you are not in the physical class, you will be responsible for completing assigned coursework in [Blackboard](#). This work can be completed any time before the posted deadline.

Please refer to this [Health and Safety web page](#) for updated information about campus guidelines as they relate to the COVID-19 pandemic.

**Technology Requirements**: This course will be using the free online homework system MyOpenMath. This homework system can be accessed through Blackboard. If you choose to take your exam online, you must have access to a camera to use the test-taking software “Gradescope”.

**Communication**: Most email will receive a response within 24 hours during working hours Monday through Friday. Please include your course name (Calculus III, Finite Math, etc.) in your messages for the quickest reply. Office hours will be held using Webex or Blackboard Collaborate.
Course Evaluation

Your grade for this course will be determined by your performance on exams and homework. Final grades will **be based on a standard 10-point grading scale**.

Tests: 60%
Final Exam: 20%
Homework: 20%

**Tests (60%)**: There will be four tests throughout the semester. These tests will be given online in Blackboard using MyOpenMath. You will be given a 48-hour window to start the test and will then have 90 minutes to complete it. In addition to entering the answers online, you must submit hand-written scratch work for each question that justifies your answer. Each test will count 15% of your final grade. If your final exam score is greater than your lowest test score, then the final exam grade will replace the test score.

**Final Exam (20%)**: In addition to the tests above, there will be a comprehensive final examination. This exam will be given online in Blackboard using MyOpenMath. You will be given a 72-hour window to take the exam and will have 120 minutes to complete it. In addition to entering the answers online, you must submit hand-written scratch work for each question that justify your answer.

**How Tests and Exams are Graded:**

The grade that you receive in MyOpenMath will likely not be your actual test grade. In addition to completing an exam/test in MyOpenMath, you will also turn in hand-written justification for each question via email within 2 hours of completing the exam/test. This justification/work would be similar to how you would turn in justification had this been a paper exam.

- For each question that you get correct, I will review your hand-written scratch work to ensure that you sufficiently justified your answer. For example, if you do not submit any scratch work for a question, your score for that question may be reduced to 0%. If you submit complete justification for a question, then your score for that question will stay at 100%. Partial, insufficient, or incorrect justification will receive a score between 0% and 100%, based on my discretion.

- For each question that you get incorrect, I will review your hand-written scratch work and see if any partial credit points should be awarded. For example, if your scratch work has full justification to show the correct answer is 104.3, but you accidentally typed in 1043 into...
MyOpenMath, then you will earn back several points. On the other hand, if your scratch work has full justification to show that the correct answer is 104.3, but you type in 37, then you will receive almost no points.

**Academic Honesty for Tests and Exams:**

Tests and exams in this class should be completed entirely on your own without the help of friends, other students, tutors, instructors, or anyone else. You may not use online resources to find answers: all calculations must be done on your own. While you may use your book and notes to complete assignments, you must not use any other resources.

**Assignments (20%):** The assignments category includes both homework and classwork that will be assigned throughout the semester. Homework will be completed online in Blackboard using MyOpenMath. You will not turn in scratch work for homework, and are welcome to receive help on homework from any source: me, students, solutions manuals, online, etc. However, it is encouraged that you work the homework on your own first, since this will be the best way to practice for tests.

**Other Information**

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:

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.

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

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. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title IX Compliance.

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 at:

Michelle Boone, J.D.
Director of Title IX Compliance/Title IX Coordinator
Mayer Administration Building, Room 210
325-942-2022

michelle.boone@angelo.edu

You may also file a report online 24/7 at www.angelo.edu/incident-form.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.
Required Use of Masks/Facial Coverings by Students

As a member of the Texas Tech University System, Angelo State University has adopted the mandatory Facial Covering Policy to ensure a safe and healthy classroom experience. Current research on the COVID-19 virus suggests there is a significant reduction in the potential for transmission of the virus from person to person by wearing a mask/facial covering that covers the nose and mouth areas. Therefore, in compliance with the university policy students in this class are required to wear a mask/facial covering before, during, and after class. Faculty members may also ask you to display your daily screening badge as a prerequisite to enter the classroom. You are also asked to maintain safe distancing practices to the best of your ability. For the safety of everyone, any student not appropriately wearing a mask/facial covering will be asked to leave the classroom immediately. The student will be responsible to make up any missed class content or work. Continued non-compliance with the Texas Tech University System Policy may result in disciplinary action through the Office of Student Conduct.

Student Learning Outcomes

The student will demonstrate factual knowledge including the mathematical notation and terminology used in this course. Students will read, interpret, and use the vocabulary, symbolism, basic definitions used in numerical analysis including those related to topics learned in calculus and algebra and revisited in this course; limits, continuity, numerical integration, numerical differentiation, ordinary differential equations, and polynomial interpolation.

The students will describe the fundamental principles including the laws and theorems arising from the concepts covered in this course. Students will identify and apply the properties and theorems that result directly from the definitions as well as statements discovered in calculus and extended in this course; for example, Rolle’s Theorem, Mean Value Theorem, Intermediate Value Theorem, Taylor’s Theorem, theorems on convergence and existence and their error terms.

The students will apply course material along with techniques and procedures covered in this course to solve problems. Students will use the facts, formulas, and techniques learned in this course to develop and use algorithms and theorems to find numerical solutions and bounds on their error to various types of problems including root finding, polynomial approximation, numerical differentiation, numerical integration.

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 gain the ability to use a software package such as MATLAB to solve numerical problems and acquire a level of proficiency in the fundamental concepts and applications necessary for further study in academic areas requiring numerical analysis as a prerequisite for graduate work or for work in occupational fields. These fields might include further study in mathematics, engineering, computer science, or the physical sciences.

Course Schedule

Important Dates

January 25: First Day of Class
April 2: Spring Holiday (University Closed)
April 30: Last Day to Drop/Withdraw
May 11 – May 13: Final Exam Window
Weekly Schedule

Below is a tentative schedule, but it is likely to change throughout the semester.

- Week 2: Equations of Lines and Planes, Quadric Surfaces, and Cylindrical and Spherical Coordinates.
- Week 3: Vector-Valued Functions, Arc Length, Curvature and Test 1.
- Week 4: Functions of Several Variables and Limits and Continuity.
- Week 5: Partial Derivatives and Tangent Planes.
- Week 6: The Chain Rule and Directional Derivatives.
- Week 7: Maximum and Minimum Values and Test 2.
- Week 8: Double Integrals over Rectangles and General Regions.
- Week 9: Double Integrals in Polar Coordinates and Triple Integrals.
- Week 10: Change of Variables and Test 3.
- Week 11: Vector Fields and Line Integrals.
- Week 12: Conservative Vector Fields and Green’s Theorem.
- Week 13: Divergence and Curl and Surface Integrals.
- Week 14: Stokes’ Theorem and Test 4.
- Week 15: The Divergence Theorem.

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i https://blackboard.angelo.edu/
ii https://www.angelo.edu/covid-19/returning-to-campus/health-and-safety.php
iii https://www.angelo.edu/student-handbook/
iv https://www.angelo.edu/catalogs/
v https://www.angelo.edu/student-handbook/community-policies/academic-integrity.php
vi https://www.angelo.edu/services/disability-services/
vii https://www.angelo.edu/content/files/14197-op-1011-grading-procedures
viii https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of
ix https://www.angelo.edu/services/title-ix/
x http://www.texastech.edu/downloads/ttus-policy-face-coverings.pdf