

# Math 3415: Calculus III

## Course Syllabus



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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

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**Instructor:** Dr. Dennis Hall

**Office:** MCS 220J

**Office Hours:** Office hours are online only and are by appointment.

### Course Information

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**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.

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

**Textbook:** *College Algebra* from OpenStax. This is a free textbook available online at <http://www.openstax.org/details/college-algebra>. You can also purchase a print version, if you prefer, via the campus bookstore.

**MyOpenMath:** The free electronic resource MyOpenMath will be used in this course. To access MyOpenMath, click the various homework links in Blackboard. You DO NOT need to purchase access.

**Technology Requirements:** This course will be using the free online homework system MyOpenMath. This homework system can be accessed through Blackboard. You will also need a webcam and computer capable of using Respondus LockDown Browser for exams. See the next page for more information about Respondus LockDown Browser.

**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.



## LockDown Browser & Respondus Monitor

### **Respondus LockDown Browser Information:**

This course requires the use of LockDown Browser and a webcam for online exams. The webcam can be the type that's built into your computer or one that plugs in with a USB cable.

Watch this brief video to get a basic understanding of LockDown Browser and the webcam feature:

<https://www.respondus.com/products/lockdown-browser/student-movie.shtml>

Download and install LockDown Browser from this link:

<https://download.respondus.com/lockdown/download.php?id=384131921>

### **Respondus: Once Installed**

- Start LockDown Browser
- Log into Blackboard Learn
- Navigate to the test

Note: You won't be able to access tests with a standard web browser. If this is tried, an error message will indicate that the test requires the use of LockDown Browser. Simply start LockDown Browser and navigate back to the exam to continue.

### **Respondus: Guidelines**

When taking an online test, follow these guidelines:

- Ensure you are in a location where you will not be interrupted.
- Turn off all other devices (e.g. tablets, phones, second computers) and place them outside of your reach.
- Before starting the test, know how much time is available for it, and also that you've allotted sufficient time to complete it.

- Clear your desk or workspace of all external materials not permitted. This course allows the use of notes, but no electronics may be used. If you take notes electronically, they must be printed out.
- Remain at your computer for the duration of the test.
- If the computer, Wi-Fi, or location is different than what was used previously with the "Webcam Check" and "System & Network Check" in LockDown Browser, run the checks again prior to the exam.
- To produce a good webcam video, do the following:
  - Avoid wearing baseball caps or hats with brims.
  - Ensure your computer or device is on a firm surface (a desk or table). Do NOT have the computer on your lap, a bed, or other surface where the device (or you) are likely to move.
  - If using a built-in webcam, avoid readjusting the tilt of the screen after the webcam setup is complete.
  - Take the exam in a well-lit room but avoid backlighting (such as sitting with your back to a window).
- Remember that LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted.

### Getting Help

Several resources are available if you encounter problems with LockDown Browser:

- The Windows and Mac versions of LockDown Browser have a "Help Center" button located on the toolbar. Use the "System & Network Check" to troubleshoot issues. If an exam requires you to use a webcam, also run the "Webcam Check" from this area.
- Angelo State University's IT Help Desk is available to help with Respondus:
  - IT Service Center (Help Desk)**
  - 325-942-2911
  - 1-866-942-2911
  - [itsupport@angelo.edu](mailto:itsupport@angelo.edu)
  - <https://www.angelo.edu/administrative-support/information-technology/Mathematics-Computer Science Building, 111>
- Respondus has a Knowledge Base available from support.respondus.com. Select the "Knowledge Base" link and then select "Respondus LockDown Browser" as the product. If your problem is with a webcam, select "Respondus Monitor" as your product.
- If you're still unable to resolve a technical issue with LockDown Browser, go to support.respondus.com and select "Submit a Ticket". Provide detailed information about your problem and what steps you took to resolve it.

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

- 2. Vectors in Space:** Vectors in the Plane, Vectors in Three Dimensions, The Dot Product, The Cross Product, Equations of Lines and Planes in Space, Quadric Surfaces, Cylindrical and Spherical Coordinates.
- 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.
- 6. Vector Calculus:** Vector Fields, Line Integrals, Conservative Vector Fields, Green's Theorem, Divergence and Curl, Surface Integrals, Stokes' Theorem, and The Divergence Theorem.

## Course Evaluation

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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: 75%

Homework: 25%

**Tests (75%):** There will be four tests during this summer semester: one each week. These tests will be given online in Blackboard using MyOpenMath and Respondus LockDown Browser with Webcam. The test windows will each open Friday morning and close Sunday night at 11:59pm. You may take the test anytime during that window. Once you start the test, you will have 90 minutes to complete it. No partial credit is given for tests.

**Final Exam (Optional, replaces a Test):** In addition to the tests above, there will be a comprehensive final examination. This comprehensive final exam is optional. If you choose to take the exam, it will replace your lowest test grade.

## **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 notes and resources written on paper during this exam, no electronics other than a scientific calculator may be used.

**Assignments (25%):** 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](#)<sup>i</sup>
- [Angelo State University Catalog](#)<sup>ii</sup>

### **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](#).<sup>iii</sup>

### **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](mailto:ADA@angelo.edu). For more information about the application process and requirements, visit the [Student Disability Services website](#).<sup>iv</sup> 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](#)<sup>v</sup> 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](#)<sup>vi</sup> 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](mailto:michelle.boone@angelo.edu)

You may also file a report online 24/7 at [www.angelo.edu/incident-form](http://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.

For more information about Title IX in general you may visit [www.angelo.edu/title-ix](http://www.angelo.edu/title-ix).<sup>vii</sup>

### **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

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### Important Dates

#### Summer I:

June 7: First day of class.

**Test 1** Window: June 11 12:01am – June 13 11:59pm.

Covers Sections: 2.1, 2.2, 2.3, 2.5, 2.6, 2.7.

**Test 2** Window: June 18 12:01am – June 20 11:59pm.

Covers Sections: 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7.

**Test 3** Window: June 25 12:01am – June 27 11:59pm.

Covers Sections: 5.1, 5.2, 5.3, 5.4, 5.5, 5.7.

**Test 4** Window: July 2 12:01am – July 5 11:59pm.

Covers Sections: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7.

**Final Exam** Window: July 8 12:01am – July 9 11:59pm.

Comprehensive: Covers all sections, including 6.8.

July 9: Last day of class.

See next page for Summer II and Full Summer.

## Summer II:

July 12: First day of class.

**Test 1** Window: July 16 12:01am – July 18 11:59pm.

Covers Sections: 2.1, 2.2, 2.3, 2.5, 2.6, 2.7.

**Test 2** Window: July 23 12:01am – July 25 11:59pm.

Covers Sections: 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7.

**Test 3** Window: July 30 12:01am – August 1 11:59pm.

Covers Sections: 5.1, 5.2, 5.3, 5.4, 5.5, 5.7.

**Test 4** Window: August 6 12:01am – August 9 11:59pm.

Covers Sections: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7.

**Final Exam** Window: August 12 12:01am – August 13 11:59pm.

Comprehensive: Covers all sections, including 6.8.

August 13: Last day of class.

## Full Summer:

June 7: First day of class.

**Test 1** Window: June 18 12:01am – June 20 11:59pm.

Covers Sections: 2.1, 2.2, 2.3, 2.5, 2.6, 2.7.

**Test 2** Window: July 9 12:01am – July 11 11:59pm.

Covers Sections: 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7.

**Test 3** Window: July 23 12:01am – July 25 11:59pm.

Covers Sections: 5.1, 5.2, 5.3, 5.4, 5.5, 5.7.

**Test 4** Window: August 6 12:01am – August 8 11:59pm.

Covers Sections: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7.

**Final Exam** Window: August 12 12:01am – August 13 11:59pm.

Comprehensive: Covers all sections, including 6.8.

August 13: Last day of class.

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<sup>i</sup> <https://www.angelo.edu/student-handbook/>

<sup>ii</sup> <https://www.angelo.edu/catalogs/>

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iii <https://www.angelo.edu/student-handbook/community-policies/academic-integrity.php>

iv <https://www.angelo.edu/services/disability-services/>

v <https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>

vi <https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>

vii <https://www.angelo.edu/services/title-ix/>