AU Math 191 950 Calculus I
Consortium of Adventist Colleges and Universities

Interactive Online Format
This course follows an interactive online format with Wednesday/Sunday deadlines. You are expected to login regularly during the course to participate in the online discussions. Please review the Dates & Deadlines widget on the right side of your course in LearningHub for the last day to withdraw for a full refund. Please plan accordingly

Instructor Contact
Instructor: Jonathan Duncan
Email: duncanj@andrews.edu
Cell: 812.610.2566

Other Assistance
<table>
<thead>
<tr>
<th>Service</th>
<th>Email/Number</th>
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<tbody>
<tr>
<td>Username and password assistance</td>
<td><a href="mailto:helpdesk@andrews.edu">helpdesk@andrews.edu</a> (269) 471-6016</td>
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<tr>
<td>Enrollment and cancellations</td>
<td><a href="mailto:sdergister@andrews.edu">sdergister@andrews.edu</a> (269) 471-6323</td>
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<td><a href="http://bookstore.mbsdirect.net/andrews.htm">http://bookstore.mbsdirect.net/andrews.htm</a></td>
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<td>Technical assistance with Moodle</td>
<td><a href="mailto:dlit@andrews.edu">dlit@andrews.edu</a> (269) 471-3960</td>
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<tr>
<td>Technical assistance with your Andrews account</td>
<td>andrews.edu/hdchat/chat.php</td>
</tr>
<tr>
<td>Exam requests</td>
<td><a href="mailto:sdeexams@andrews.edu">sdeexams@andrews.edu</a> (269) 471-6566</td>
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</tbody>
</table>

Any other questions: sde@andrews.edu, (800) 782-4769 or (269) 471-6570

Part 1: Course Information

Course Descriptions
Andrews University
This course is a standard introduction to single-variable calculus. It includes limits, continuity, derivatives, applications, and integration up through and including substitution and integration by parts. Formal definitions of the limit, derivative, and Riemann integral are included. Proofs of standard theorems, including the Fundamental Theorem of Calculus, are given. Fulfills the General Education Mathematics reasoning requirement.

Prerequisite
Andrews University
MPE>P5 or MATH 167 or MATH 168 with a grade of C or better

Course Learning Outcomes
- Understand the foundational concepts of the differential Calculus.
- Learn to use the derivative as a tool for understanding function behavior.
- Engage in mathematical thinking, reasoning, and problem solving.
- Become proficient in expressing clear and accurate solutions to calculus problems in written form.
- Catch a glimpse of the power of calculus and the limitless aspects of God’s character.
Required Textbook and Course Material
There are two textbook options. The first (recommended) option includes text for both Calculus I and Calculus II. The second option includes just the text for Calculus I.

Credit Hours
This course is offered for 4 credits; therefore, it is expected that you would spend 12 hours per week during the 15 week duration of the class. It is suggested that you divide your weekly study time as follows:

- Textbook Reading/Powerpoint Slides: 2-3 hours
- Online Lectures: 2-3 hours
- Discussion Posts: 30 minutes
- WeBWorK Assignments: 5 hours 30 minutes
- Solution-Write Up Assignments: 1 hour

This schedule will vary somewhat throughout the course, especially during weeks in which exams are scheduled.

Part 2: Course Methods

Course/Technical Requirements
- Modern computer system including:
  - High speed internet connection (DSL, Cable Modem, LAN)
  - Modern web browser (Google Chrome 19+, Firefox 3.0+, IE 9+, etc) with flash plugin for viewing videos
  - Sound card and speakers/headphones for listening to videos
  - Adobe Acrobat Reader (free from http://www.adobe.com/)
- Simple scientific calculator including trigonometric, exponential, and logarithmic functions. (You may not use a calculator capable of symbolic mathematics on exams).

Learning Management System
This course is delivered online through Moodle at [http://learninghub.andrews.edu](http://learninghub.andrews.edu)

Your username is password is your Andrews username and password. You need to activate your username and password to access Learning Hub.

Please do this online here: [https://vault.andrews.edu/vault/pages/activation/information.jsp](https://vault.andrews.edu/vault/pages/activation/information.jsp) if you haven’t already. Call (269) 471-6016 or email helpdesk@andrews.edu if you need assistance.

If you need technical assistance at any time during the course, or to report a problem with LearningHub, please email dlit@andrews.edu or call (269) 471-3960.
**Part 3: Course Requirements**

**Important Note:** This online class is not self-paced. You can arrange your schedule flexibly during each week, but you MUST participate each week. You are expected to “show up” to class by reading the textbook sections, watching the video lectures, completing the homework, and interacting in the discussion forums regularly during the week. Adequate Internet access during the duration of the course is critical for your participation. To be successful, plan to spend time daily on the course.

**Please Be Advised:** The schedule is provided in advance so you may read ahead of schedule. Your dedication, professionalism, and excellence in study skills habits are necessary. If you have any course content questions, please contact your professor. If you have technical questions, contact dlit@andrews.edu.

The various activities listed in the course schedule below fall into two categories: non-graded activities and graded assignments. The activities in each category are described below in more detail.

**Non-Graded Activities**

Even though these activities do not count directly towards your grade, they are important steps in the learning process.

- **Textbook Readings**
  Before watching the lecture videos or attempting the assignments for a given section, you should read the associated textbook section. Mathematics textbooks should be read with pencil and paper so that you can work your way through the examples as you read.

- **Powerpoint Presentations**
  Powerpoint presentations are provided corresponding to each textbook section. These presentation slides are useful for guiding your reading and for reviewing the concepts given in the text.

- **Lecture Videos**
  Associated with each section of the textbook is a video or collection of videos which is equivalent to a lecture in a face-to-face course. These videos highlighting the most important parts of each section, give useful hints or shortcuts, and providing you with examples in addition to those given in the text. You should read through the lessons and watch the video examples **before** starting on the associated WeBWorK or written assignments.

**Graded Course Activities**

These assignments give you the opportunity to demonstrate mastery of the course material. They are divided into several categories, each with a specific purpose and weight.

- **WeBWorK Assignments (15% of your grade)**
  Mathematics is not a spectator sport! Reading your textbook and watching lecture videos is typically not enough for you to master the material. As an athlete must spend hours practicing in order to excel in his or her sport, so you must practice your Calculus skills if you wish to do well on exams.
The online homework system WeBWorK will help you do just that by checking your answers and giving you instantaneous feedback. After reading your textbook and watching the videos for a section, print out the associated WeBWorK assignment and work through the problems on paper. When you are comfortable with your answers (after possibly seeking help), return to WeBWorK and submit them. Don't worry if you get them wrong the first time. In most cases you have an unlimited number of attempts on each problem (but don’t just guess either—that defeats the purpose of doing the homework to learn the material). If WeBWorK marks one of your answers wrong, go back and check your work or seek assistance using WeBWorK's Email Instructor button.

- **Solution Write-Up Assignments (10% of your grade)**
  While WeBWorK can check your final answer, it does not check your solution process, your ability to present that solution, or your ability to construct a basic proof or draw a graph. In order to do well in the exams, you must not only be able to find the right answer, but express your solution using correct mathematical notation in a logical and well-organized fashion. To help you practice these skills, you will be asked to complete a solution write-up assignments for each chapter covered in the course. In these assignments you will present solutions to selected problems from your textbook. You will then scan or take a picture of your work and upload it to Moodle.

- **Discussion Posts (5% of your grade)**
  Several times during the term you will be asked to respond to a discussion question. These questions promote the integration of faith and learning by asking you to reflect on the connections between mathematics and spiritual issues. Discussion questions involve the entire class and you will be expected to both answer the question yourself and comment on fellow class members’ responses. The following rubric will be used to evaluate your initial posts and responses

<table>
<thead>
<tr>
<th>Response is:</th>
<th>Excellent (5)</th>
<th>Average (3)</th>
<th>Below Average (1)</th>
<th>Unacceptable (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>well thought-out, addressing the question carefully and completely.</td>
<td>reasonable, but does not address all aspects of the question, addresses them carelessly.</td>
<td>minimal, showing little thought and missing many question aspects completely.</td>
<td>off topic or completely missing.</td>
</tr>
</tbody>
</table>

- **Midterm Exams (2 x 20 = 40% of your grade)**
  There will be two midterm exams during the term. The first covers the material from chapters one and two. The second covers chapters the last section of chapter two, chapter three and most of chapter four. The exams are administered by a proctor (see below) and will be taken with pencil and paper. You may use a simple scientific calculator (without symbolic math capabilities) on both exams, but you must show all steps in your solutions. Solutions lacking neatness and/or proper evidence will be discounted at the instructor’s discretion.

- **Final Exam (30% of your grade)**
  The final exam is comprehensive, but emphasizes the material from after the second exam. That is the last two sections of chapter four and all of chapter five. The format of the final is similar to that of the midterm, with the same rules applying.
**Assessment Feedback**

Feedback on assignments and exams will be provided in a timely manner, as outlined below.

- **WeBWorK Assignments**
  Feedback is provided instantaneously by the WeBWorK system. If you have questions, or believe that you have entered a correct solution that is not being accepted, please email your instructor using the Email Instructor button at the bottom of each WeBWorK page or post a question to the Homework Help Forum at the top of the course homepage in Moodle.

- **Solution Write-Up Assignments**
  Your instructor will grade your write-up assignments and post your score, along with comments on any improvements you should make to your solution writing, within one week of the date on which you submit the assignment.

- **Discussion Posts**
  Feedback on your discussion posts will be provided within one week of the posting due date.

- **Exams**
  All students midterm and final exams will be graded together to ensure equitable partial credit is assigned. For this reason, your instructor will not start grading exams until all students' exams have been received from the proctors. Grading will be completed within one week of the date that the last exam is received. Exam scores will be posted, but the exams themselves will not be returned. You may contact your instructor for additional feedback on your exam performance.

**Exams**

These are print-based exams. You will be allowed 120 minutes to complete each midterm exam and the final exam. You will need to bring your photo ID to the exam and may bring a graphing calculator. The midterm exams will be worth 40% of your grade, and the final exam will be worth 30%.

All exams must be supervised by a school or community official, such as a teacher, librarian, registrar, or pastor, who is not related to the student.

The exam request form will available in Learning Hub after you have completed the assignments prior to the exam. The student must state clearly on the exam request form the professional status, job title, or any other qualifications of the supervisor that will aid the testing department in the approval process. If you are attending a college or university, you must use the testing center at that institution. A student living near the Andrews University School of Distance Education main office in Michigan must have the exams supervised at the School of Distance Education testing office. However, the exam request should be sent in ahead of time.

An online exam code cannot be sent to a supervisor who has the same address as the student unless the address is known to be that of a school, mission facility, etc.

All college students must present photo identification to their supervisor before taking exams.

If you cannot take your exam by the deadline date, email sdeexams@andrews.edu.
In order for an exam grade to be recorded, a signed Supervisor’s Signature Form must accompany the exam being returned.

No exam is returned to the student or supervisor. Test grades are sent to the student as soon as the exam is graded. Feedback from the instructor for midterm exams will provide information for studying for future exams.

**16 Week Schedule:**

*All due dates are Eastern Standard Time, Sunday at 11:59 pm.*

<table>
<thead>
<tr>
<th>Week</th>
<th>Readings</th>
<th>Assignments</th>
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| 1    | 1.1-1.3: Review of Functions  
Apx. C: Trigonometry | Plagiarism Assignment  
Introductions Forum Post  
WeBWorK 1.1-1.3  
WeBWorK Apx.C |
| 2    | 1.5: Exponential Functions  
1.6: Inverse Functions and Logarithms  
1.7: Parametric Curves | WeBWorK 1.5  
WeBWorK 1.6  
WeBWorK 1.7  
Solution Write-Up Chapter 1 |
| 3    | 2.1: The Tangent and Velocity Problems  
2.2: The Limit of a Function  
Apx. D: Precise Definition of a Limit | WeBWorK 2.1  
WeBWorK 2.2  
WeBWorK 2.3  
WeBWorK 2.4  
WeBWorK 2.5 |
| 4    | 2.3: Calculating Limits Using the Limit Laws  
2.4: Continuity  
2.5: Limits Involving Infinity | WeBWorK 2.6  
WeBWorK 2.7  
Exam I |
| 5    | 2.6: Derivatives and Rates of Change  
2.7: The Derivative of a Function | WeBWorK 2.8  
Solution Write-Up Chapter 2  
WeBWorK 3.1  
WeBWorK 3.2 |
| 6    | 2.8: What does f’ Say about f?  
3.1: Derivatives of Polynomials & Exponentials  
3.2: The Product and Quotient Rules | WeBWorK 3.3  
WeBWorK 3.4  
Discussion Question #2 |
| 7    | 3.3: Derivatives of Trigonometric Functions  
3.4: the Chain Rule | WeBWorK 3.5  
WeBWorK 3.6  
WeBWorK 3.7 |
| 8    | 3.5: Implicit Differentiating  
3.6: Inverse Trig Functions & Their Derivatives  
3.7: Derivatives of Logarithmic Functions | WeBWorK 3.8  
Solution Write-Up Chapter 3  
WeBWorK 4.1 |
| 9    | 3.9: Linear Approximations and Differentials  
4.1: Related Rates | WeBWorK 4.2  
WeBWorK 4.3  
WeBWorK 4.5 |
| 10   | 4.2: Maximum and Minimum Values  
4.3: Derivatives and the Shapes of Curves  
4.5: Indeterminate Forms and l’Hospital’s Rule | WeBWorK 4.6  
Exam II |
| 11   | 4.6: Optimization Problems | WeBWorK 4.7  
WeBWorK 4.8  
Solution Write-Up Chapter 4 |
| 12   | 4.7: Newton’s Method  
4.8: Antiderivatives | WeBWorK 5.1  
WeBWorK 5.2  
Discussion Question #3 |
| 13   | 5.1: Areas and Distances  
5.2: The Definite Integral | WeBWorK 5.3  
WeBWorK 5.4 |
| 14   | 5.3: Evaluating Definite Integrals  
5.4: The Fundamental Theorem of Calculus | WeBWorK 5.5  
WeBWorK 5.6  
Solution Write-Up Chapter 5 |
| 15   | 5.5: The Substitution Rule  
5.6 Integration by Parts | |
| 16   | 5.7: Linear Approximations  
5.8: Newton’s Method  
5.9 Integration by Parts | |

**Week Schedule:**

**1. Week (January 4-10)****

**Readings:**

1.1-1.3: Review of Functions
Apx. C: Trigonometry

**Assignments:**

- Plagiarism Assignment
- Introductions Forum Post
- WeBWorK 1.1-1.3
- WeBWorK Apx.C

**2. Week (January 11-17)****

**Readings:**

1.5: Exponential Functions
1.6: Inverse Functions and Logarithms
1.7: Parametric Curves

**Assignments:**

- WeBWorK 1.5
- WeBWorK 1.6
- WeBWorK 1.7
- Solution Write-Up Chapter 1

**3. Week (January 18-24)****

**Readings:**

2.1: The Tangent and Velocity Problems
2.2: The Limit of a Function
Apx. D: Precise Definition of a Limit

**Assignments:**

- WeBWorK 2.1
- WeBWorK 2.2
- WeBWorK 2.3
- WeBWorK 2.4
- WeBWorK 2.5

**4. Week (January 25-31)****

**Readings:**

2.3: Calculating Limits Using the Limit Laws
2.4: Continuity
2.5: Limits Involving Infinity

**Assignments:**

- WeBWorK 2.6
- WeBWorK 2.7
- Exam I

**5. Week (February 1-7)****

**Readings:**

2.6: Derivatives and Rates of Change
2.7: The Derivative of a Function

**Assignments:**

- WeBWorK 2.8
- Solution Write-Up Chapter 2
- WeBWorK 3.1
- WeBWorK 3.2

**6. Week (February 8-14)****

**Readings:**

2.8: What does f’ Say about f?
3.1: Derivatives of Polynomials & Exponentials
3.2: The Product and Quotient Rules

**Assignments:**

- WeBWorK 3.3
- WeBWorK 3.4
- Discussion Question #2

**7. Week (February 15-21)****

**Readings:**

3.3: Derivatives of Trigonometric Functions
3.4: the Chain Rule

**Assignments:**

- WeBWorK 3.5
- WeBWorK 3.6
- WeBWorK 3.7

**8. Week (February 22-28)****

**Readings:**

3.5: Implicit Differentiating
3.6: Inverse Trig Functions & Their Derivatives
3.7: Derivatives of Logarithmic Functions

**Assignments:**

- WeBWorK 3.8
- Solution Write-Up Chapter 3
- WeBWorK 4.1

**9. Week (February 29-March 6)****

**Readings:**

3.9: Linear Approximations and Differentials
4.1: Related Rates

**Assignments:**

- WeBWorK 4.2
- WeBWorK 4.3
- WeBWorK 4.5

**10. Week (March 7-13)****

**Readings:**

4.2: Maximum and Minimum Values
4.3: Derivatives and the Shapes of Curves
4.5: Indeterminate Forms and l’Hospital’s Rule

**Assignments:**

- WeBWorK 4.6
- Exam II

**11. Week (March 21-27)****

**Readings:**

4.6: Optimization Problems

**Assignments:**

- WeBWorK 4.7
- WeBWorK 4.8
- Solution Write-Up Chapter 4

**12. Week (March 29-April 3)****

**Readings:**

4.7: Newton’s Method
4.8: Antiderivatives

**Assignments:**

- WeBWorK 5.1
- WeBWorK 5.2
- Discussion Question #3

**13. Week (April 4-10)****

**Readings:**

5.1: Areas and Distances
5.2: The Definite Integral

**Assignments:**

- WeBWorK 5.3
- WeBWorK 5.4

**14. Week (April 11-16)****

**Readings:**

5.3: Evaluating Definite Integrals
5.4: The Fundamental Theorem of Calculus

**Assignments:**

- WeBWorK 5.5
- WeBWorK 5.6
- Solution Write-Up Chapter 5

**15. Week (April 17-24)****

**Readings:**

5.5: The Substitution Rule
5.6 Integration by Parts

**Assignments:**

- WeBWorK 5.7
- WeBWorK 5.8
- Solution Write-Up Chapter 6

**16. Week (April 25-28)****

**Readings:**

Final Exam

**Assignments:**

- WeBWorK 5.9
- WeBWorK 5.10
- Solution Write-Up Chapter 7

**Spring Break:**

March 14-20

**Final Exam:**

April 25-28
Assignment Submission and Grading
All assignments for this course will be submitted electronically through Moodle and WeBWorK unless otherwise instructed. Assignments and exams must be completed in the order noted on the schedule.

Part 4: Grading Policy
A summary of the weights for the various graded assignment types is given below. You will need to complete every Assignment, the Midterm Exam, and the Semester Exam before a grade can be issued.

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<tr>
<th>Percent</th>
<th>Description</th>
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<tbody>
<tr>
<td>15</td>
<td>WeBWorK</td>
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<tr>
<td>10</td>
<td>Solution Write-Ups</td>
</tr>
<tr>
<td>5</td>
<td>Journal Posts</td>
</tr>
<tr>
<td>2 x 20 = 40</td>
<td>Midterm Exams</td>
</tr>
<tr>
<td>30</td>
<td>Final Exam</td>
</tr>
<tr>
<td>100%</td>
<td>Total Percent Possible</td>
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</table>

Viewing Grades in Moodle
To view your grades at any time, follow the steps listed below. Note that grades for written assignments, journal posts, and exams may take some time to be calculated and posted, as described above.

- Click into the course.
- Click on the Grades link in the Settings Box to the left of the main course page.

Letter Grade Assignment

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<tr>
<td>F</td>
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</table>
Part 5: Course Policies

Withdrawal and Incomplete Policies
The current withdrawal policy can be found online at http://www.andrews.edu/distance/students/withdrawal.html. The incomplete policy is found online at http://www.andrews.edu/weblmsc/moodle/public/incompletes.html.

Incomplete Policy
An Incomplete (I) indicates that the student’s work is incomplete because of illness or unavoidable circumstances and not because of negligence or inferior performance. Students will be charged an incomplete fee for each incomplete grade issued.

Communication with the Instructor
It is important to remember that while the Internet is available 24 hours a day, your instructor is not. You can expect that your instructor will respond to an e-mail message within 2 business days during the week and may not be available to respond on weekends.

Unlike in a face-to-face class, your instructor can not tell if you did not understand a concept by watching your expression. To help make your online learning experience go smoothly, please remember the following points.

- It is your responsibility to initiate contact with your instructor or otherwise seek out help if you do not understand something.
- Do not put off seeking help. Communicate early and often if you don't understand something. Be persistent. If a fellow student's or your instructor's explanation still does not make sense, politely ask for further help.

Communication with Others
As you participate in online discussion forums and chat, it is important to remember some basic things about online communication. Consider some traditional communication that you may have experienced:

- If you send a personal letter to someone it is private communication between you and the recipient — unless the recipient shares the letter with others
- If you put a notice on a bulletin board in the student union, it becomes publicly visible by anyone who visits the bulletin board.
- When you chat with a group of friends at the coffee shop, students sitting nearby can hear your conversation.

The same concepts translate into the online environment:

- E-mail is private communication between the sender and receiver(s) – but can easily be made public by the receiver(s) if they share the message with others
- Discussion forums and blogs are public spaces.
• Chat is public and may involve multiple “talkers” and “listeners” as well as “eavesdroppers”

**Maintain Professional Conduct Both in the Classroom and Online**
The classroom is a professional environment where academic debate and learning take place. Your instructor will make every effort to make this environment safe for you to share your opinions, ideas, and beliefs. In return, you are expected to respect the opinions, ideas, and beliefs of other students—both in the face-to-face classroom and online communication.

Students have the right and privilege to learn in the class, free from harassment and disruption.

**Academic Accommodations**
Students who require accommodations may request an academic adjustment as follows:

1. Read the Andrews University Disability Accommodation information at [https://www.andrews.edu/services/sscenter/disability/](https://www.andrews.edu/services/sscenter/disability/).

2. Download and fill in the disability form at [http://www.andrews.edu/services/sscenter/disability/accommodationsreqform.pdf](http://www.andrews.edu/services/sscenter/disability/accommodationsreqform.pdf). Preferably type answers. To save a digital copy, 1) print to file and save or 2) print and scan. Email the completed form and disability documentation (if any) to success@andrews.edu or fax it to 269-471-8407.

3. Email sdestudents@andrews.edu to inform the School of Distance Education that a disability has been reported to Student Success.

**Commitment to Integrity**
As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this class and also integrity in your behavior in and out of the classroom.

**Honesty**
Using the work of another student or allowing work to be used by another student jeopardizes not only the teacher-student relationship but also the student’s academic standing. Lessons may be discussed with other students, tutors may help to guide a student’s work, and textbooks, encyclopedias and other resource materials may be used for additional assistance, but the actual response must be the student’s own work.

Exams must be completed in the presence of an approved supervisor without the assistance of books, notes, devices or outside help unless otherwise specified in the exam directions. The student should have no access to the exam either before or after it is taken. A student who gives information to another student to be used in a dishonest way is equally guilty of dishonesty.

Any violation of this policy will be taken before the Higher Education Academic and Curriculum Committee for appropriate punitive action.
Part 6: Bibliography

Discussion questions were developed in conjunction with the following sources:

- World Science Festival (www.worldsciencefestival.com/)
- The Veritas Forum (www.veritas.org/)