

## Calculus and Analytic Geometry I

### MATH-131

CG Section 16WK 11/10/2019 to 04/18/2020 Modified 05/26/2022

### Course Description

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Functions and graphs, exponential, logarithmic, inverse trigonometric, limits, the derivative, techniques of differentiation, continuity, applications of differentiation, L'Hopital's Rule, the integral.

#### Requisites

For information regarding prerequisites for this course, please refer to the [Academic Course Catalog \(https://catalog.liberty.edu/\)](https://catalog.liberty.edu/).

### Rationale

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This course, along with MATH 132, provides a standard introduction to the study of calculus. It presents the theory and applications of elementary calculus necessary for further study of mathematics.

### Course Learning Outcomes

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Upon successful completion of this course, the student will be able to:

- A. Find limits of elementary functions.
- B. Demonstrate knowledge of continuity of functions by solving problems in written form using proper mathematical notation and terminology.
- C. Carry out the differentiation of elementary functions.
- D. Sketch and discuss the graphs of elementary functions.
- E. Demonstrate knowledge of the application of differentiation by solving problems in written form using proper mathematical notation and terminology.
- F. Carry out integration of elementary functions.
- G. Demonstrate knowledge of the application of integration by solving problems in written form using proper mathematical notation and terminology.

#### General Education Foundational Skill Learning Outcomes (FSLOs):

##### *Technological Solutions and Quantitative Reasoning (TSQR):*

Upon successful completion of this course, the student will be able to:

- TSQR 1: Analyze data and inform action through a structured method.
- TSQR 2: Predict the output based on an input in practical scenarios using technological solutions and/or quantitative reasoning.
- TSQR 3: Apply the skills needed for a successful financial stewardship in various contexts.
- TSQR 4: Relate technology and quantitative reasoning to participation in God's redemptive work.

### Course Resources

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Click on the following link to view the required resource(s) for the term in which you are registered: [Liberty University Online Bookstore \(https://bncvirtual.com/liberty\)](https://bncvirtual.com/liberty).

#### Additional Materials for Learning

- A. Computer with basic audio/video output equipment
- B. Internet access (broadband recommended)
- C. Canvas [recommended browsers \(https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66\)](https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66)
- D. Microsoft Word
- E. Access to a scanner or a device with a scanning feature

## ☰ Course Assignments

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### Textbook readings and presentations

#### Course Requirements Checklist

After reading the Course Syllabus and Student Expectations, the student will complete the related checklist found in Course Overview.

#### Prerequisite Project Assignment

During Module 1, the student will complete the Prerequisite Project Assignment. This project consists of a combination of prerequisite math problems and questions involving course information. The grade for this project will be determined by completing the problems and submitting the assignment correctly. The student does not need to get every prerequisite math question correct to get a perfect score on the project.

(TSQR: 1-3)

#### Homework Assignments (16)

Homework will be assigned through WebAssign, and the student will have multiple attempts at each problem. Even though homework problems are given online, the student is encouraged to work out solutions on paper using correct mathematical notation before entering data into WebAssign.

(CLO: A-G, TSQR: 1-3)

#### Quizzes (12)

Using the online WebAssign software, you will complete 12 module quizzes. Each module quiz will be based on the readings, watch videos, the corresponding homework of the assigned module. Module quizzes and tests occur on separate modules, so you will have at most one module quiz or one test each module. Module quizzes are timed assignments, and must each be completed within 30 minutes.

(CLO: A-G, TSQR: 1-3)

#### Test Assignments

Each test will be timed, handwritten, and open-book/open-notes and will cover the Learn material for the assigned modules. The time limit for each test is 120 minutes (2 hours). On all written work, the student is expected to write correct mathematics to avoid point deductions.

(CLO: A-E, TSQR: 1-3)

#### Final Exam Assignment

The Final Exam will be timed, handwritten, and open-book/open-notes and will cover all of the material from the course. The time limit for the exam is 180 minutes (3 hours). On all written work, the student is expected to write correct mathematics to avoid point deductions.

## ✓ Course Grading

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Course Requirements Checklist	10
Prerequisite Project Assignment	60
Homework Assignments 1–16 (10 pts ea)	160
Module Quizzes (12 at 15 pts ea)	180
Test Assignments (3 at 100 pts ea)	300
Final Exam Assignment	300
<b>Total</b>	<b>1010</b>

## Policies

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### Mathematical Late Assignment Policy

*Mathematical* assignments that are submitted after the due date without prior approval from the instructor will receive the following deductions

1. Late *mathematical* assignments submitted within one week after the due date will receive a 10% deduction.
2. *Mathematical* assignments submitted more than one week late or after the final date of the course will not be accepted.
3. Discussion board assignments submitted within one week after the due date will receive a 10% deduction.
4. Discussion board submitted more than one week and less than 2 weeks late will receive a 20% deduction.
5. Discussion board submitted more than 2 weeks late will not be accepted.
6. Group projects, including group discussion board threads and/or replies, and assignments will not be accepted after the due date.

Special circumstances (e.g. death in the family, personal health issues) will be reviewed by the instructor on a case-by-case basis.

For other assignments, please refer to the standard Late Assignment Policy, below.

### Late Assignment Policy

Course Assignments, including discussions, exams, and other graded assignments, should be submitted on time.

If the student is unable to complete an assignment on time, then he or she must contact the instructor immediately by email.

Assignments that are submitted after the due date without prior approval from the instructor will receive the following deductions:

1. Late assignments submitted within one week after the due date will receive up to a 10% deduction.
2. Assignments submitted more than one week and less than 2 weeks late will receive up to a 20% deduction.
3. Assignments submitted two weeks late or after the final date of the course will not be accepted outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.
4. Group projects, including group discussion threads and/or replies, and assignments will not be accepted after the due date outside of special circumstances (e.g. death in the family, significant personal health issues), which will be reviewed on a case-by-case basis by the instructor.

## Disability Assistance

Students with a disability and those with medical conditions associated with pregnancy may contact Liberty University's Online Office of Disability Accommodation Support (ODAS) at [LUOODAS@liberty.edu](mailto:LUOODAS@liberty.edu) for accommodations. Such accommodations require appropriate documentation of your condition. For more information about ODAS and the accommodations process, including how to request an accommodation, please visit <https://www.liberty.edu/online/online-disability-accommodation-support/> (<https://www.liberty.edu/online/online-disability-accommodation-support/>). Requests for accommodations not related to disabilities or pregnancy must be directed to the Registrar's Office, which generally handles medical needs support.

If you have a complaint related to disability discrimination or an accommodation that was not provided, you may contact ODAS or the Office of Equity and Compliance by phone at (434) 592-4999 or by email at [equityandcompliance@liberty.edu](mailto:equityandcompliance@liberty.edu). Click to see a full copy of Liberty's [Discrimination, Harassment, and Sexual Misconduct Policy](https://www.liberty.edu/media/1226/Liberty_University_Discrimination_Harassment_and_Sexual_Misconduct_Policy.pdf) ([https://www.liberty.edu/media/1226/Liberty\\_University\\_Discrimination\\_Harassment\\_and\\_Sexual\\_Misconduct\\_Policy.pdf](https://www.liberty.edu/media/1226/Liberty_University_Discrimination_Harassment_and_Sexual_Misconduct_Policy.pdf)) or the [Student Disability Grievance Policy and Procedures](http://www.liberty.edu/media/8021/Disability_Grievance_Procedures.pdf) ([http://www.liberty.edu/media/8021/Disability\\_Grievance\\_Procedures.pdf](http://www.liberty.edu/media/8021/Disability_Grievance_Procedures.pdf)).

## Course Attendance

In an effort to comply with U.S. Department of Education policies, attendance is measured by physical class attendance or any submission of a required assignment within the enrollment dates of the course (such as examinations, written papers or projects, any discussion posts, etc.) or initiating any communication with one's professor regarding an academic subject. More information regarding the [attendance policy](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FOnline%2BAttendance%2Band%2BNon-Attendance&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613719138&sdata=%2BNBTsPOoXuHAPLflSQRugK7cRSuV6UyC7qD3agf3l2k%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FOnline%2BAttendance%2Band%2BNon-Attendance&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613719138&sdata=%2BNBTsPOoXuHAPLflSQRugK7cRSuV6UyC7qD3agf3l2k%3D&reserved=0>) can be found in the [Academic Course Catalogs](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.liberty.edu%2Findex.cfm%3FPID%3D791&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=DjjhMiRBFnF%2B2ZJUC8eBd1OdNb26S9ADukODYsilXIA%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.liberty.edu%2Findex.cfm%3FPID%3D791&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=DjjhMiRBFnF%2B2ZJUC8eBd1OdNb26S9ADukODYsilXIA%3D&reserved=0>). Regular attendance in online courses is expected throughout the length of the term. Students who do not attend within the first week of a sub-term by submitting a required academic assignment (such as the Course Requirements Checklist, an examination, written paper or project, discussion post, or other academic activity) will be dropped from the course. Students who wish to re-engage in the course are encouraged to contact Academic Advising to discuss their enrollment options. Students who begin an online course, but at some point in the semester cease attending, and do not provide official notification to withdraw, will be assigned a grade of "FN" ([Failure for Non-Attendance](https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FUnofficial%2BWithdrawals&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=MoMvZdPfza69InuhVHMHAVqu59ZP0Fw45xJTU9PIBrU%3D&reserved=0) (<https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwiki.os.liberty.edu%2Fdisplay%2FIE%2FUnofficial%2BWithdrawals&data=02%7C01%7Caccollins2%40liberty.edu%7Cd91431fa6ac547056b5408d833029e1a%7Cbf8218eb3024465a9934a39c97251b2%7C0%7C0%7C637315433613729132&sdata=MoMvZdPfza69InuhVHMHAVqu59ZP0Fw45xJTU9PIBrU%3D&reserved=0>)). Students wishing to withdraw from courses after the official start date should familiarize themselves with the [withdrawal policy](#).

## Grading Scale

A	B	C	D	F
900-1010	800-899	700-799	600-699	0-599

For courses with a Pass/NP final grade, please refer to the Course Grading section of this syllabus for the assignment requirements and/or point value required to earn a Passing final grade.

## Add/Drop Policy

The full policy statement and procedures are published in the [Policy Directory](https://wiki.os.liberty.edu/display/IE/Dropping+and+Adding+Online+Classes) (<https://wiki.os.liberty.edu/display/IE/Dropping+and+Adding+Online+Classes>).

## Honor Code

Liberty University comprises a network of students, Alumni, faculty, staff and supporters that together form a Christian community based upon the truth of the Bible. This truth defines our foundational principles, from our Doctrinal Statement to the

Code of Honor. These principles irrevocably align Liberty University's operational procedures with the long tradition of university culture, which remains distinctively Christian, designed to preserve and advance truth. Our desire is to create a safe, comfortable environment within our community of learning, and we extend our academic and spiritual resources to all of our students with the goal of fostering academic maturity, spiritual growth and character development.

Communities are predicated on shared values and goals. The Code of Honor, an expression of the values from which our Doctrinal Statement was born, defines the fundamental principles by which our community exists. At the core of this code lie two essential concepts: a belief in the significance of all individuals, and a reliance on the existence of objective truth.

While we acknowledge that some may disagree with various elements of the Code of Honor, we maintain the expectation that our students will commit to respect and uphold the Code while enrolled at Liberty University.

Adherence to the principles and concepts established within facilitates the success of our students and strengthens the Liberty community.

The Code of Honor can be viewed in its entirety at <http://www.liberty.edu/index.cfm?PID=19155> (<http://www.liberty.edu/index.cfm?PID=19155>).

## Schedule

When	Topic	Notes
Course Overview	Student Acknowledgements	Course Requirements Checklist
	Technology Integration Set-Up	[Any required tech integration assignment set-up. Ex., "Quiz: Connect Registration"]
Module 1	Learn	Read: 5 items Watch: 4 items Interact: 1 item
	Apply	HW: H01 Introduction to Limits Assignment Prerequisite Project Assignment Quiz: MQ1 Introduction to Limits
Module 2	Learn	Read: 3 items Watch: 2 items
	Apply	HW: H02 Limits Involving Infinity Assignment Quiz: MQ2 Limits Involving Infinity
Module 3	Learn	Read: 2 items Watch: 1 item
	Apply	HW: H03 Precise Formulation of Limits Assignment Quiz: MQ3 Precise Formulation of Limits
Module 4	Learn	Read: 3 items Watch: 2 items
	Apply	HW: H04 Continuity Assignment Quiz: Limits Test

When	Topic	Notes
<b>Module 5</b>	Learn	Read: 4 items Watch: 3 items
	Apply	HW: H05 Definition of the Derivative Assignment Quiz: MQ4 Definition of the Derivative
<b>Module 6</b>	Learn	Read: 11 items Watch: 9 items
	Apply	HW: H06 Derivative Rules (Part 1) Assignment HW: H07 Derivative Rules (Part 2) Assignment Quiz: Limits Test Corrections Assignment (Optional) Quiz: MQ5 Derivative Rules (Part 1) Quiz: MQ6 Derivative Rules (Part 2)
<b>Module 7</b>	Learn	Read: 4 items Watch: 3 items
	Apply	HW: H08 Related Rates & Linear Appr. Assignment Quiz: Calculating Derivatives Test
<b>Module 8</b>	Learn	Read: 5 items Watch: 4 items
	Apply	HW: H09 Maximum and Minimum Values Assignment Quiz: MQ7 Maximum and Minimum Values
<b>Module 9</b>	Learn	Read: 4 items Watch: 3 items
	Apply	HW: H10 Prop. of Graphs from Calculus Assignment Quiz: Calculating Derivatives Test Corrections Assignment (Optional) Quiz: MQ8 Properties of Graphs from Calculus
<b>Module 10</b>	Learn	Read: 5 items Watch: 4 items
	Apply	HW: H11 Other Topics in Diff. Calculus Assignment Quiz: MQ9 Other Topics in Differential Calculus
<b>Module 11</b>	Learn	Read: 2 items Watch: 1 item
	Apply	HW: H12 Approximating Area Assignment Quiz: Applications of Derivatives and Riemann Sums Test

When	Topic	Notes
<b>Module 12</b>	Learn	Read: 13 items Watch: 11 items
	Apply	HW: H13 Antiderivatives Assignment HW: H14 Variable Substitution Assignment Quiz: Application of Derivatives and Riemann Sums Test Corrections Assignment (Optional) Quiz: MQ10 Antiderivatives Quiz: MQ11 Variable Substitution
<b>Module 13</b>	Learn	Read: 5 items Watch: 4 items
	Apply	HW: H15 Area Btwn Curves & Vol. of Rev. Assignment Quiz: MQ12 Area Btwn Curves & Volumes of Revolution
<b>Module 14</b>	Learn	Read: 2 items Watch: 1 item
	Apply	HW: H16 Work and Average Value Assignment Quiz: Overview of Calculus I Test