Calculus I (QL)

MATH1210 001

READ:

Welcome to Calculus! This syllabus has a lot of information. Please take time to read through it and re-read relevant parts when questions about the course arise later. This will help you be familiar with the course. Ask your instructor questions you have that are not directly addressed in the syllabus; frequent communication with your instructor is highly recommended. Ignorance regarding information in the syllabus, the course's due dates, assignments, exams, etc., is not accepted nor excused. Be aware and be prepared. Work well and work hard. If you do, then you will learn a lot in this course, and consequently, you will develop mathematically and intellectually, which is part of its many purposes. Have a great semester!

Course Prerequisites

This course is for students who, within the past year, have successfully completed both College Algebra (Math 1050) and Trigonometry (Math 1060) courses within the last year, or a Precalculus course (Math 1080) within the last year, with a grades of C or better (preferably, B or better).

Course Description

Calculus 1 introduces the following topics: limits, derivatives of algebraic and transcendental functions, applications of differentiation, integration, the Fundamental Theorem of Calculus, the technique of substitution, and finding the area between curves.

Pre-Requisite: Within the last year, MATH 1050 and MATH 1060 w/C grade or better; OR MATH 1080 w/C grade or better, OR appropriate placement.
Semester: All

Required Text

OpenStax Calculus (free OER book available here in Canvas).

For more information on text accessibility, contact Accessibility & Disability Services at ads@slcc.edu.

Communication Plan

The best way to contact me is via the Canvas Inbox, as I will prioritize this email over other modes of communication.

Calculator Rule

Programmable calculators, graphing calculators, and any calculators capable of algebraic manipulations, are not allowed on in-class quizzes, regular exams, or the final exam.

Prohibited calculators include all the various makes of the following base models: TI36, TI83, TI84, TI86, TI89, TI92, TI-Nspire, HP48, as well as other similar models and brands. An example of an acceptable standard, scientific, non-graphing calculator is the TI30, which is relatively inexpensive. Your instructor can verify if a calculator is acceptable for use during quizzes or exams. How to use graphing software or how to program will not be taught in Math 1050, but it will also not be assessed.

Occasionally, a standard scientific calculator, say, a TI30, is required for basic approximation of radicals, logarithmic expressions, and the like, even on exams, like the final exam. It is advised that students always have a basic calculator with them for quizzes and exams just in case that one is allowed or needed. Note that it is the instructor's prerogative to give quizzes, tests, or portions of tests that do not allow any calculator. Not having a calculator does not excuse a student from being responsible for taking a quiz or exam at the assigned time or completing problems.

Students are expected to be able to perform basic calculations such as fractional arithmetic, finding exact simplified root values, manipulating algebraic expressions at the course level, etc., without a calculator. While a few homework problems and applications may require the use of a graphing calculator or online app, e.g., Desmos, questions on

in-person quizzes or exams will only test basic facts that must be demonstrated by students without aid beyond blank scratch paper and a standard, scientific, non-graphing calculator. A student's performance will be measured primarily on their understanding of the concepts and their competency in performing symbolic operations rather than a mere ability to use technology (pushing buttons) to get answers. Full credit will only be awarded on exam questions when answers are justified by a legible and valid argument.

General Education Information

QL

This course satisfies the **Quantitative Literacy** (QL) graduation requirement. As such there is a required e-portfolio project.

e-Portfolio Project (Signature Assignment): There is one required signature course assignment that must be posted to your e-portfolio along with a thoughtful reflection (a reflective writing) about the e-portfolio project/course. The e-portfolio will count 5% of your total course grade.

To create an ePortfolio, use Sharepoint: Sharepoint Gen Ed Hub

Your General Education ePortfolio tells your SLCC learning story. Your ePortfolio enables you to introduce yourself to your professors and classmates, showcase your learning, and reflect on how your courses connect to each other, your life, goals, and community. The ePortfolio is intended to help you connect with other students and communicate with professors about how you learn, what you are taking away from your experience, and what supported your learning in their class. Professors can use your ePortfolio to get to know you before class and use your reflections and signature assignments to continuously improve their teaching.

Your General Education ePortfolio will also help you weave together the concepts you learn across all general education courses. To do this, each general education course you take at the college will ask you to demonstrate your engagement with the general education learning outcomes by designing a course-specific ePortfolio page that includes a Signature Assignment and reflection. When you finish your time at SLCC, your ePortfolio should provide a multi-media showcase of your educational experience and tell

the story of your learning growth while at SLCC. You can learn more and create your ePortfolio by visiting the Sharepoint Gen Ed Hub

In order for us to learn from your ePortfolio and provide effective support, we must be able to access your ePortfolio. To make sure your ePortfolio is accessible to professors, check your My SLCC ePortfolio Card:

1. Copy the URL for your ePortfolio from the web browser.

2. Click here and then check to see if there is already a hyperlink under the General Education ePortfolio heading.

3. If there is no link, paste the copied link to your Welcome page and click "Save." If there is a link already, verify that the link is correct and update it if it is not correct.

4. Finally, confirm that everything worked by clicking on the link and making sure it goes to your Gen Ed ePortfolio Welcome page.

ACTIVE LEARNING: This course utilizes instructional videos for outside of class viewing and also will involve participation in hands-on classroom activities.

VIDEOS: The purpose of the videos is to free up class time for in depth learning. The videos are embedded in the class Canvas site and will prepare you with a short basic lecture so that you may come to class prepared to ask questions and to work with your classmates on any activities for the day. Be sure to view the videos prior to attending class. Take notes on them for future reference.

ACTIVITIES: The activities for each week are available on the class Canvas site. You will need to print them out and bring them with you to class (or bring a device to access electronically). While classroom time is provided for the activities, you may need additional time outside of class to complete them. The activities for each week will be due on the following Sunday night. They will be scanned and submitted in Canvas. 10% will be deducted for each day the assignment is late.

Brief Description of Assignments/Exams

Homework: You will be completing your homework online in Derivita which is embedded in Canvas. There will be due dates posted in Canvas and there is a 10% per day late fee applied. Working these exercises is considered a minimum for you to demonstrate the learning objectives of the course and sufficient mastery of the course's concepts/techniques, etc.

Ask your instructor if you have questions! Please keep current on your homework and ask questions about the homework when/if needed. It is very easy to feel overwhelmed if one gets too far behind. Don't allow that to happen! Be and remain diligent.

Of course, regular and often intense practice is essential for learning and retaining mathematics, like learning any demanding subject. You should be prepared to spend at least two hours studying outside of the class for each hour of class. For online classes, that minimum will require additional time to complete the lessons on your own. However, many students find that much more time is required to perform as well as they desire on exams. You are encouraged to work more exercises than those assigned, say, from the text, for extra practice. Do what is necessary for you to perform well.

Course Folder: In case of human or computer error, it is highly recommended that you keep all homework, projects, and exams in a folder (hardcopy or digital) until you have received a final grade for the entire course. Protect yourself!

Late Homework: There is a 10% per day penalty for late homework.

Regular Exams: There will be four regular exams on the dates given in the course schedule. No sample regular exams will be given to students by the instructor for any regular exams (this is a Math Departmental Rule).

Final Exam: There is a mandatory, departmental, comprehensive, proctored final exam. Its format will be paper, and pen-or-pencil, with 20 to 30 mandatory, show-your-work problems, no multiple choices. Students will show/write their work for each problem and all final exams will be graded according to the work shown. Partial credit is possible for relevant, partially correct work. Final exams are not given early or late (plan now). All students must take the final exam to pass the class. Final exams can only be taken once a semester. Final exams are not returned to students, not even upon request. The Math

Department keeps final exams on record for up to a few years for data collection, samples of student work, and to help prevent cheating in following semesters.

Exam Rules: *Every* exam is proctored. No note cards, notes, texts, collaboration, internet devices, programming/graphing calculators, or external aid of any kind are allowed on any exam, including the final exam. Scratch paper and a standard scientific, non-graphing, non-programmable calculator are allowed, e.g., TI30 but not TI36 or higher; see the Calculator Rule below. All exam-work to be graded must be (re)written on the exam's pages itself. There are no final exam retakes and no final exam corrections of any kind can be submitted for points.

60% Final Exam Rule: The Math Department's 60% Final Exam Rule is that if a student scores less than 60% on their final exam then their total course grade will be the lower of a D or their grade as calculated according to the weights of the grading categories on the syllabus. In other words, if a student fails their final exam (scores less than 60%), then the highest total course grade that they can earn for the course is a D.

This is an important departmental rule, which must be enforced to help ensure the success of students taking courses that have Math 1210 as a prerequisite. Moreover, it enforces a reasonable standard. Rules such as this also help make, "seamless," transfers to other USHE institutions possible. Without such rules, your SLCC math credit might not transfer to other higher ed institutions!

Math Department's Testing Rule: *All* SLCC math exams, regular exams and final exams, must be taken in person in a live proctored/monitored environment for *all* modalities (in-person, hybrid, livestream, or online). Online and livestream students are required to take their exams at an SLCC testing center facility or, if outside a 50-mile radius, coordinate with the Testing Center for a proctoring site nearer to their home. Any accommodations to this rule must be approved by the SLCC Math Department Associate Dean. Students are encouraged to make arrangements early in a semester with employers and families to ensure they are free during the scheduled exam periods; see the disclaimer below.

In-Person Testing Disclaimer: It is a student's responsibility to make arrangements early with employers, family, etc. to be free during all scheduled exams. **Missing an exam for work, for example, is not excused** as students are aware of exam dates the first day of classes. Any student not willing or not able to comply with in-person testing in their

classroom, or at an SLCC Testing Center, during scheduled times should not register, or remain registered, for this class.

Grading Scale

Grade Weights: The breakdown percentages are as follows.

Derivita HW and Pre-Req Reviews 15% of semester grade
Activities 10% of semester grade
Signature Assignments & e-Portfolio 5% of semester grade
In Class Exams 40% of semester grade
Final Exam 30% of semester grade

Total numeric course grades are mapped to letter grades according to the following partition, using interval notation:

A [93%, 100%]	C [73%, 77%)
A- [90%, 93%)	C- [70, 73%)
B+ [87%, 90%)	D+ [67, 70%)
B [83%, 87%)	D [63, 67%)
B- [80%, 83%)	D- [60, 63%)
C+ [77%, 80%)	E [0%, 60%)

Take note that grades are not, “rounded up“ or curved.

Incompletes: Typically, incompletes are only considered when a student has completed at least 70% of total course work and is passing the class at the time the incomplete is requested. In this class, this amounts to all course work being completed minus the final exam. Thus, if a student has completed all work except the final and is passing, then their instructor may consider, but does not have to grant, an incomplete grade to a requesting student; it is the instructor's prerogative. Incompletes are not given for more time to learn material or to avoid an undesirable grade. They are given primarily

in the case of an emergency that prevented a student from being able to submit final papers/exams/etc.

Student Academic Calendar

As students you should be aware of all important dates in the semester, such as the day that courses begin and end, as well as the drop date and the last day to withdraw. To learn more about those dates, navigate to the Student Academic Calendar below:

SLCC Student Academic Calendar

Assignment Schedule

Due Date	Assignment Name	Assignment Type	Points
8/23	Student tutorial	Assignment	100
8/25	Activity 1A Prerequisite Review Part 1	Assignment	12
8/25	Activity 1B Prerequisite Review Part 2	Assignment	12
8/25	Review of Algebra & Trigonometry	Assignment	100
8/26	Pre-Req Review - Lines and Functions	Assignment	4
8/29	Create & Link Your ePortfolio	Assignment	10
9/2	Activity 2 Average & Instantaneous Velocity	Assignment	12
9/2	Section 2.1 - The Tangent and Velocity Problems	Assignment	100

Due Date	Assignment Name	Assignment Type	Points
9/2	Section 2.2 - The Limit of a Function	Assignment	100
9/2	Section 2.2+ - Limits at Infinity; Horizontal Asymptotes	Assignment	100
9/3	Pre-Req Review - Composition and Limits for Continuity	Assignment	2
9/8	Activity 4 Continuity	Assignment	12
9/8	Section 2.3 - Calculating Limits Using the Limit Laws	Assignment	100
9/8	Section 2.4 - Continuity	Assignment	100
9/8	Activity 3 The Notion of a Limit	Assignment	12
9/9	Pre-Req Review - Difference Quotient	Assignment	3
9/15	Activity 5 Precise Definition of a Limit Graphically	Assignment	12
9/15	Activity 6 Secant lines and Tangent Lines	Assignment	12
9/15	Activity 7 The Derivative as a Function	Assignment	12
9/15	Section 2.5 - The Precise Definition of a Limit	Assignment	100

Due Date	Assignment Name	Assignment Type	Points
9/15	Section 3.1 - Derivatives and Rates of Change	Assignment	100
9/15	Section 3.2 - The Derivative as a Function	Assignment	100
9/16	Test 1	Assignment	88
9/22	Activity 8 Derivatives of Power Functions	Assignment	12
9/22	Activity 9 The Product & Quotient Rules	Assignment	12
9/22	Section 3.3 - Differentiation Rules	Assignment	100
9/29	Activity 10 Derivatives of Trig Functions	Assignment	12
9/29	Activity 11 Chain Rule	Assignment	12
9/29	Activity 12 Chain Rule Practice	Assignment	12
9/29	Section 3.5 - Derivatives of Trigonometric Functions	Assignment	100
9/29	Section 3.6 - The Chain Rule	Assignment	100
9/29	Extra Credit Monster Chain Rule Problem	Assignment	0
10/1	Pre-Req Review - Inverse Trig Functions	Assignment	6

Due Date	Assignment Name	Assignment Type	Points
10/2	Pre-Req Review - Logs	Assignment	5
10/6	Activity 13 Implicit Differentiation	Assignment	12
10/6	Activity 14 Derivatives of Inverse Trig Functions	Assignment	12
10/6	Activity 15 Logarithmic Differentiation	Assignment	12
10/6	Section 3.4 - Derivatives as Rates of Change	Assignment	100
10/6	Section 3.7 & 3.8 - Derivatives of Inverse Functions and Implicit Differentiation	Assignment	100
10/6	Section 3.9 - Derivatives of Exponential and Logarithmic Functions	Assignment	100
10/8	Pre-Req Review - Related Rates Prep	Assignment	3
10/13	Activity 16 Related Rates	Assignment	12
10/13	Activity 17 Differentials & Linearization	Assignment	12
10/13	Activity 18 Hyperbolic Functions	Assignment	12

Due Date	Assignment Name	Assignment Type	Points
10/13	Section 4.1 - Related Rates	Assignment	100
10/13	Section 4.2 - Linear Approximations and Differentials	Assignment	100
10/13	Section HF - Hyperbolic Functions	Assignment	100
10/15	Test 2	Assignment	100
10/21	Activity 19 Extreme Values	Assignment	12
10/21	Section 4.3 - Maximum and Minimum Values	Assignment	100
10/22	Signature Project	Assignment	80
10/23	Pre-Req Review - Review Equation Solving & Trig Stuff	Assignment	10
10/27	Activity 20 L'Hopital's Rule	Assignment	12
10/27	Activity 21 What Derivatives Tell Us About Graphs	Assignment	12
10/27	Section 4.4 - The Mean Value Theorem	Assignment	100
10/27	Section 4.5 - Derivatives and the Shape of a Graph	Assignment	100

Due Date	Assignment Name	Assignment Type	Points
10/27	Section 4.8 - Indeterminate Forms and l'Hospital's Rule	Assignment	100
11/3	Activity 22 Curve Sketching	Assignment	12
11/3	Activity 23 Optimization	Assignment	12
11/3	Section 4.6 - Summary of Curve Sketching	Assignment	100
11/3	Section 4.7 - Optimization Problems	Assignment	100
11/3	Section 4.9 - Newton's Method	Assignment	100
11/5	Test 3	Assignment	82
11/6	Pre-Req Review - Antiderivatives	Assignment	4
11/10	Activity 24 Newton's Method	Assignment	12
11/10	Activity 25 Antiderivatives	Assignment	12
11/10	Section 4.10 - Antiderivatives	Assignment	100
11/11	Pre-Req Review - Summations and Areas	Assignment	9
11/17	Activity 26 Area and Distance	Assignment	12

Due Date	Assignment Name	Assignment Type	Points
11/17	Activity 27 Riemann Sums	Assignment	12
11/17	Section 5.1 - Areas and Distances	Assignment	100
11/17	Section 5.2 - The Definite Integral	Assignment	100
11/20	Pre-Req Review - Substitution Prep	Assignment	8
11/24	Activity 30 Substitution	Assignment	12
11/24	Section 5.4 - Indefinite Integrals and the Net Change Theorem	Assignment	100
11/24	Section 5.5 - The Substitution Rule	Assignment	100
11/24	Activity 28 Definite Integrals	Assignment	12
11/24	Section 5.3 - The Fundamental Theorem of Calculus	Assignment	100
12/1	Activity 31 Area Between Curves	Assignment	12
12/1	Section 6.1 Areas Between Curves	Assignment	100
12/2	Test 4	Assignment	100
12/3	Course Reflection and ePortfolio	Assignment	50
12/9	Final Exam	Assignment	140

Contingency Remote Workday/Learning Plan

Under Utah legislation, the governor can now call a "Remote Workday" given certain circumstances. These remote workdays can be due to inclement weather, pollution, or natural disasters.

1. Each math instructor (full or part-time) will **check-in/communicate** with the Math AD, say, with an email that acknowledges the remote workday and their relative plan for it.
2. The Math AD will verify whether a class will still meet on a campus if something happens at the campus, etc.
3. Each instructor will make a **Canvas class announcement and communicate with students**, informing them of the remote learning day and what their relative plan is for the day's class. Announcements will include pertinent info for the remote day and/or any adjustments to the next class:

- What are the assigned readings, video lectures to watch, practice problems to work?
- Is the instructor holding a Zoom meeting in lieu of the in-person class? The Zoom meeting must be optional and should be conducted at the same time as the regularly scheduled class, if possible. Moving to livestream modality is only an option, not required of the instructor or students. The Zoom meeting could simply be to answer student questions.
- Any test that was scheduled on a remote learning day will be postponed, either to the next class or possibly later scheduled through the Testing Center. Instructors will let students know that the exam has been postponed in their Canvas announcement.

How to Navigate to Canvas

Student Conduct

Students are expected to follow the SLCC Student Code of Conduct at Student Code of Conduct.

Classroom Deportment: Each student is responsible for their own behavior. Any student who shows a pattern of disrespect for others, or who at any time displays egregious disrespect for others, will be subject to penalties as per the student code of conduct.

Attendance: Class attendance and/or participation, whether in-person, broadcast, or online, are expected. They are typically essential to achieve satisfactory results. It is the student's responsibility to be aware of all material covered, in-class announcements, tests dates, assignment due dates, etc.

Electronic Devices in the Classroom: Absolutely no video or audio recording in the classroom is allowed without prior written authorization from the instructor. Cell phones and other electronic devices should be in silence mode during classes, tests, and final exams. Moreover, such devices should not be on desks during lectures, tests, and the final exam unless they are part of the class' participation activities.

Cell phones and tech in-class: In case of emergency, or otherwise, students should exit the classroom before they e-mail, text, or use their cell phones. If students choose to use a computer or electronic device in class to take notes, they may do so without distracting their classmates. Computer activities that are not directly related to the class should not be done in-class, e.g., watching YouTube or the like. Students who text, scroll on their phones, talk on their cell phone, or use their computers to do activities not directly related to the class will be asked to leave the classroom.

Cheating Rule: Cheating on any Math 1050 assignment or exam will minimally result in a failing grade of 0% for that assignment without any possibility for that work to be made up, resubmitted, or for the failing grade to be substituted by any other work's grade. Moreover, cheating on a single assignment or exam can result in a failing grade for the entire class; this is typically the prerogative of the individual instructor. Cheating is not tolerated, so, take heed and do honest work to learn and develop intellectually. For

more details about academic dishonesty, consult the Student Code of Conduct, where this topic is addressed in section C (see below too):

Policies and Student Affairs.

Sanctions for Academic Misconduct (taken from the Student Code of Conduct): Faculty, program directors, associate deans, deans, and the provost for Academic Affairs are authorized to impose any one or a combination of the following sanctions after finding a student responsible for acts of academic misconduct. The possible sanctions include, but are not limited to

- verbal warning and reprimand,
- restriction of privileges, such as access to lab facilities, library facilities, or testing centers,
- failure of the exam, quiz, project, or other assessment,
- failure for the course,
- withdrawal from the course, or
- withdrawal from the academic program.

Upon the circumstance of catching a student cheating, even if the infraction seems minor or the student is remorseful, instructors are expected to fill out the following form (the Dean of Students uses these forms to establish patterns of behavior):

Academic Misconduct Violation Reporting Form.

Institutional Policies

As members of our academic community, we would like to invite you to review the Institutional Syllabus which covers important policies and procedures. This document contains important links for students on the code of student rights and responsibilities, academic integrity, and grading policies, Title IX and other important acknowledgements. By familiarizing yourself with this information, you can help us create a safe and respectful environment for everyone.

You can access the document by clicking on the following link: https://slcc.instructure.com/courses/530981/pages/institutional-syllabus

Learning Support and Tutoring Services

We are pleased to offer a range of tutoring and learning support services to help you achieve your academic goals. Whether you need assistance with a specific subject or want to improve your study skills, you have many options for tutoring or other support.

To learn more about the services we offer and how to access them, please visit the Institutional Syllabus under the Tutoring and Learning Support tab: https://slcc.instructure.com/courses/530981/pages/institutional-syllabus. We encourage you to take advantage of these resources to help you succeed in your studies. If you have any questions or would like to schedule a tutoring session, please don't hesitate to reach out to us. We are here to support you in any way we can.

General Learning Support & Tutoring Services

General Learning Support & Tutoring Services provide support for SLCC students enrolled in any class at the College. You may also ask your instructor about discipline-specific learning support and tutoring services. The following resources are provided free-of-charge.

- In your Canvas course, there is a (blue) tab, “Online Tutoring,” in the left column of tabs. This literally provides free online tutoring during hours of operation.
- For in-person Redwood campus help in math, the next resource is highly recommended: **STEM Center** in SI building, which offers free STEM tutoring.

STEM Center Hours (may vary by semester): Monday-Thursday, 10:00 a.m.-9:00 p.m. Friday and Saturday, 10:00 a.m.-5:00 p.m.

Tutoring: This is an index of tutoring resources.

STEM Learning Centers: Provides free assistance in Math, Science, Accounting, CSIS and Allied Health Classes at 6 campus locations.

Student Writing Center: Provides in-person and online feedback on all writing assignments.

Library Services: Provides research help, print and online resources, computers and study space.

ePortfolio Lab: Provides drop-in assistance for all ePortfolio questions.

eLearning Support: Provides support for navigating online and hybrid classes.

Accessibility and Disability Services: If you have a disability and want an accommodation, please contact:

- Phone: 801-957-4659
- Email: ADS@slcc.edu
- Website: ADS

Advising and Counseling Support Services

At our institution, we are committed to supporting your academic and personal growth. That's why we offer a range of advising and counseling services to help you navigate the challenges of college life. To learn more about the resources available to you and how to access them, please visit the Institutional Syllabus under the Advising and Counseling Support Services tab: https://slcc.instructure.com/courses/530981/pages/institutional-syllabus. Our advising team and the support centers across campus are here to support you in achieving your goals and overcoming any obstacles you may face.

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 Phone: 801-957-4659

 Email: ADS@slcc.edu

 Website: ADS

Course Student Learning Outcomes

- Student will be able to find the value of limits using limit theorems.
- Student will be able to determine limits by inspecting graphs.
- Student will be able to use algebraic techniques to simplify limit expressions and evaluate.
- Student will be able to find points or intervals of discontinuity.
- Student will be able to find one-sided limits.
- Student will be able to find limits at infinity and infinite limits.
- Student will be able to use limits to find horizontal and vertical asymptotes.
- Student will be able to find the slope and equation of a tangent line.
- Student will be able to find f '(x) using the limit definition of derivative.
- Student will be able to find points at which a function is differentiable.
- Student will be able to find the average rate of change and instantaneous rate of change of a function.
- Student will be able to find higher order derivatives of a function.
- Student will be able to find derivatives by using differentiation rules.
- Student will be able to differentiate trigonometric functions.
- Student will be able to differentiate logarithmic functions.
- Student will be able to use logarithmic differentiation.
- Student will be able to use the chain rule to differentiate functions.
- Student will be able to find derivatives using implicit differentiation.
- Student will be able to find the derivative of the inverse of a function.
- Student will be able to differentiate exponential functions.
- Student will be able to fse L’ Hospital’s Rule to find limits of indeterminate form.
- Student will be able to solve word problems involving related rates.
- Student will be able to find critical points of a function.
- Student will be able to find maximum and minimum values for a function on an interval.
- Student will be able to determine whether Rolle’s Theorem and the Mean Value Theorem apply to a given function.

- Student will be able to determine intervals where a function is increasing or decreasing.
- Student will be able to determine intervals where a function is concave up or concave down.
- Student will be able to find inflection points.
- Student will be able to solve optimization applications.
- Student will be able to find approximate solutions to equations using Newton's Method.
- Student will be able to find and use linear approximations of functions.
- Student will be able to find and use differentials.
- Student will be able to find antiderivatives.
- Student will be able to evaluate selected sigma expressions.
- Student will be able to write a given sum using sigma notation.
- Student will be able to calculate upper and lower sums to approximate the area between a nonnegative function and the x-axis on a given interval.
- Student will be able to use definite integrals to find areas.
- Student will be able to use the properties of definite integrals to evaluate integrals.
- Student will be able to use the Fundamental Theorem of Calculus to evaluate definite integrals.
- Student will be able to evaluate indefinite integrals.
- Student will be able to use substitution to evaluate integrals, changing limits of integration as necessary.
- Student will be able to find areas between curves using integration.
- Organize and communicate quantitative and mathematical information in writing, including proofs of mathematical theorems.
- Model real world problems using average rates of change, derivatives and integrals.
- Obtain mathematical knowledge and understanding of calculus including notation and theorems for use in upper division courses.