



## Course Syllabus

**Course Title: Essential Calculus**

**Term and Year:**

**Course and Section Number: MA 173**

**Time and Place:**

**Number of Credit Hours: 3**

**Instructor:**

**Office Location/Hours:**

**Office Phone:**

**Email:**

**Course Description:** This course introduces students to basic concepts in the field of calculus. Topics include: limits, introduction to differential and integral calculus with applications, and fundamental theorem of integral calculus with applications.

**Learning Outcomes:** Upon completion of this course, the student should be able to:

1. Use different methods of evaluating limits.
2. Apply basic rules of differentiation.
3. Solve real world problems using calculus techniques.
4. Interpret graphs of simple functions.
5. Demonstrate basic techniques of integration, including substitution.

**Prerequisites:** MA 113 College Algebra

**Required Text:** This course utilizes OER (Open Educational Resources) materials at no cost to learners. All required reading is available in the online course room. The textbook can also be accessed for free at <http://www.opentextbookstore.com/buscalc/BusCalc.pdf>.

### References:

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<https://www.youtube.com/watch?v=QEWofIMJXfM>

Mathispower4u (2010). *Introduction to Function – Part 2* [Video]. YouTube.

<https://www.youtube.com/watch?v=sW9-zBeQpCU>

Mathispower4u (2013). *Graphing 9 Basic Functions* [Video]. YouTube.

<https://www.youtube.com/watch?v=IP70kcTtWkl>

Mathispower4u (2009). *Interval Notation* [Video]. YouTube.

<https://www.youtube.com/watch?v=hqg85P0ZMZ4>

Mathispower4u (2009). *Determining Domain and Range* [Video]. YouTube.

<https://www.youtube.com/watch?v=FtJRstFMdhA>

Mathispower4u (2010). *Composite Functions* [Video]. YouTube.

<https://www.youtube.com/watch?v=qxBmISCJSME>

Mathispower4u (2012). *Ex: Decompose Functions* [Video]. YouTube.

<https://www.youtube.com/watch?v=gFSSk8jaAwA>

Mathispower4u (2010). *Functions Transformations: A Summary* [Video]. YouTube.

<https://www.youtube.com/watch?v=An29CALYjAA>

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<https://www.youtube.com/watch?v=izsiAR4p4jk>

Mathispower4u (2011). *Graphing a Line in Slope-Intercept Form* [Video]. YouTube.

<https://www.youtube.com/watch?v=eDf9Kxh3XAA>

Mathispower4u (2009). *Properties of Exponents* [Video]. YouTube.

<https://www.youtube.com/watch?v=0GAMbuPJGOY>

Mathispower4u (2009). *Negative Exponents* [Video]. YouTube.

<https://www.youtube.com/watch?v=R7Yp5TW1NTs>

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[https://www.youtube.com/watch?v=L5Z\\_3RrrVjA](https://www.youtube.com/watch?v=L5Z_3RrrVjA)

Mathispower4u (2009). *Graphing Quadratic Functions in General Form* [Video]. YouTube.

<https://www.youtube.com/watch?v=oH6eZ6oDRBI>

Mathispower4u (2010). *Graphing Quadratic Functions in Standard Form (Vertex Form)* [Video].

YouTube. <https://www.youtube.com/watch?v=L8-7QepRSi8>

Mathispower4u (2011). *Ex 1: Solve a Quadratic Equation Graphically on Calculator* [Video].

YouTube. <https://www.youtube.com/watch?v=CU9FuOxK1cl>

Mathispower4u (2009). *The Quadratic Formula* [Video]. YouTube.

<https://www.youtube.com/watch?v=H3UIU0jcJDI>

Mathispower4u (2012). *Turning Points and X Intercepts of a Polynomial Function* [Video]. YouTube.

<https://www.youtube.com/watch?v=9WW0EetLD4Q>

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YouTube. [https://www.youtube.com/watch?v=KLP9\\_6Ywbvo](https://www.youtube.com/watch?v=KLP9_6Ywbvo)

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<https://www.youtube.com/watch?v=OEQnQNvJtG0>

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[Video]. YouTube. <https://www.youtube.com/watch?v=stiMWgo03es>

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<https://www.youtube.com/watch?v=Rpounu3epSc>

Mathispower4u (2010). *The Properties of Logarithms* [Video]. YouTube.

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Mathispower4u (2012). *Ex: Graph an Exponential Function and Logarithmic Function* [Video].

YouTube. <https://www.youtube.com/watch?v=w1A2ZYmfGco>

Mathispower4u (2010). *Solving Exponential Equations - Part 2 of 2* [Video]. YouTube.

<https://www.youtube.com/watch?v=5R5mKpLsfYg>

Mathispower4u (2012). *Ex: Find the Domain of Logarithmic Functions* [Video]. YouTube.

<https://www.youtube.com/watch?v=Om0ZMzIqUk&feature=youtu.be>

Mathispower4u (2011). *Average Rate of Change* [Video]. YouTube.

<https://www.youtube.com/watch?v=F-7Poa3i1ZU>

Mathispower4u (2014). *Graphical Approach to Average and Instantaneous Rate of Change* [Video].

YouTube. <https://www.youtube.com/watch?v=s0RI7F-oGRY>

Mathispower4u (2012). *Ex: Average Rate of Change Application - Hot Air Balloon Function* [Video].

YouTube. <https://www.youtube.com/watch?v=Hn6BtrzYeJ8>

Mathispower4u (2012). *Ex: Use Average Velocity to Predict Instantaneous Velocity* [Video].

YouTube. <https://www.youtube.com/watch?v=lp1ugRvu4bA>

Mathispower4u (2009). *Introduction to Limits* [Video]. YouTube.

[https://www.youtube.com/watch?v=ahZ8LLtgu\\_w](https://www.youtube.com/watch?v=ahZ8LLtgu_w)

Mathispower4u (2009). *Continuity using Limits* [Video]. YouTube.

<https://www.youtube.com/watch?v=Q7tEPyKS4Jg>

Mathispower4u (2009). *Introduction to the Derivative* [Video]. YouTube.

<https://www.youtube.com/watch?v=IDjdzwsm4Q>

Mathispower4u (2013). *Ex 1: Estimate the Value of a Derivative at a Point on a Graph Using a*

*Tangent Line* [Video]. YouTube. <https://www.youtube.com/watch?v=kx9IGSQXUVc>

Mathispower4u (2013). *Ex: Determine the Open Intervals Where the First Derivative is Positive or*

*Negative* [Video]. YouTube. <https://www.youtube.com/watch?v=NZVj-sKHAkq>

Mathispower4u (2014). *Ex: Determine the Linear Cost Revenue, and Profit Functions From a Story*

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<https://www.youtube.com/watch?v=3T0mD8vKLN4>
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<https://www.youtube.com/watch?v=wq2O3o4s1q0>
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[https://www.youtube.com/watch?v=1x\\_wMYFOliQ](https://www.youtube.com/watch?v=1x_wMYFOliQ)
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- Mathispower4u (2009). *Higher-Order Derivatives: Part 1 of 2* [Video]. YouTube.  
[https://www.youtube.com/watch?v=-\\_VkzdNok4](https://www.youtube.com/watch?v=-_VkzdNok4)
- Mathispower4u (2009). *Higher-Order Derivatives: Part 2 of 2* [Video].  
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[https://www.youtube.com/watch?v=v\\_LI05Qsu8U](https://www.youtube.com/watch?v=v_LI05Qsu8U)
- Mathispower4u (2009). *The second derivative test to determine relative extrema* [Video]. YouTube.  
<https://www.youtube.com/watch?v=2tmRPytHBuk>
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The Organic Chemistry Tutor (2021). *Optimization Problems - Calculus* [Video]. YouTube.

<https://www.youtube.com/watch?v=lx8RcYcYVuU&t=1484s>

Mathispower4u (2014). *Determining Area Under Graphs Using Geometric Formulas* [Video].

YouTube. <https://www.youtube.com/watch?v=lulnER0F3ws>

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<https://www.youtube.com/watch?v=B8WYjWiw5YM>

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Mathispower4u (2014). *Introduction to Antiderivatives and Indefinite Integration (No Trig)* [Video].

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Mathispower4u (2017). *The Fundamental Theorem of Calculus* [Video]. YouTube.

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The Organic Chemistry Tutor (2021). *Antiderivatives* [Video]. YouTube.

<https://www.youtube.com/watch?v=xaCPDMEkbig&t=17s>

The Organic Chemistry Tutor (2018). *The U-substitution With Definite Integrals* [Video]. YouTube.

<https://www.youtube.com/watch?v=wg2O3o4s1q0>

The Organic Chemistry Tutor (2021). *How To Integrate Using U-Substitution* [Video]. YouTube.

<https://www.youtube.com/watch?v=sdYdnpYn-1o&t=36s>

**Other Materials:** Scientific Calculator

**Course Requirements:**

**Attendance/Participation:** All students are expected to log in to their courses regularly throughout the week to receive instruction, materials, and updates from the instructor. It is your responsibility to check in and submit your assignments, complete your discussion board postings, and finish quizzes and exams by the due dates.

If you do not participate in the course, you will be counted absent. Simply logging in is not enough; you must submit/complete an assignment, post to a discussion board, or other similar assignment tasks to avoid being counted absent. Instructors are required to submit attendance the Monday following each week of class.

This attendance is reported to the Financial Aid Department and may result in the loss of any financial aid refund you are expecting if you have not been participating in your courses. **In addition, you will be administratively dropped from the course if you are reported absent a total of three weeks.**

### Grading/Evaluation:

#### Trine Graduate Grading Scale:

Grade	Percentage	Quality Points	Meaning of Grade
<b>A</b>	93-100	4.0	Excellent
<b>B+</b>	86-92	3.5	Very Good
<b>B</b>	81-85	3.0	Good
<b>C+</b>	75-80	2.5	Above Average
<b>C</b>	70-74	2.0	Average (lowest passing grade)
<b>F</b>	00-69	0.0	Failure
<b>I</b>	Incomplete	Not figured into GPA	
<b>IP</b>	In Progress (grade deferred)	Not figured into GPA	
<b>W</b>	Withdrawal	Withdrawal before completion of 80% of semester	
<b>WP</b>	Withdrawal	Withdrawal after completion of 80% of semester issued only under special circumstances and with approval of the department chair/director	

All course work will be completed on Moodle. Moodle will be used as the official gradebook. Your overall grade will be based on:

<b>Assessments</b>	<b>Grade Distribution</b>
Discussion Forums (8)	5%
Drag-and-Drop Key Terms Reviews (8)	5%
Papers (6)	10%
Chapter Assignments (19)	15%
Chapter Quizzes (8)	15%
Exams (2)	30%
Final Exam (1)	20%

**Late Work:**

No late work will be accepted in normal cases. However, in exceptional situations and with proper official documentation (doctor's note, police report, etc.) an extension may be granted.

**Other Policies:****Artificial Intelligence Policy:** (Pick one below)

**Artificial Intelligence (AI) is prohibited:** All work submitted by students in this course must be generated by the student. Students may not have another person or entity contribute to an assignment for them, which includes using AI. Students may not incorporate any part of an AI-generated response in an assignment, use AI to formulate arguments, use AI to generate ideas for an assignment, or submit work to an AI platform for improvement. Using an AI tool to generate content may qualify as academic misconduct in this course.

OR

**Artificial Intelligence (AI) is allowed:** Students may use AI tools on instructor-identified assignments in this course. To adhere to our scholarly values, students must cite any AI-generated material that informed their work. Using an AI tool without proper attribution may qualify as academic misconduct in this course. It is the responsibility of the student to verify the accuracy, reliability, and ethical implications of AI-generated content.

**Academic Misconduct:**

The University prohibits all forms of academic misconduct. Academic misconduct refers to dishonesty in examinations (cheating), presenting the ideas or the writing of someone else as one's own (plagiarism) or knowingly furnishing false information to the University by forgery, alteration, or misuse of University documents, records, or identification. Academic dishonesty includes, but is not limited to, the following examples: permitting another student to plagiarize or cheat from one's own work, submitting an academic exercise (written work, printing, design, computer program) that has been prepared totally or in part by another, acquiring improper knowledge of the contents of an exam, using unauthorized material during an exam, submitting the same paper in two different courses without knowledge and consent of professors, or submitting a forged grade change slip or computer tampering. The faculty member has the authority to grant a failing grade in cases of academic misconduct as well as referring the case to Student Life.

**Plagiarism:**

You are expected to submit your own work and to identify any portion of work that has been borrowed from others in any form. An ignorant act of plagiarism on final versions and minor projects, such as attributing or citing inadequately, will be considered a failure to master an essential course skill and will result in an F for that assignment. A deliberate act of plagiarism, such as having someone else do your work, or submitting someone else's work as your own



(e.g., from the Internet, fraternity file, etc., including homework and in-class exercises), will at least result in an F for that assignment and could result in an F for the course.

### Electronic Devices:

Use of electronic devices including smart watches and cell phones is prohibited during exams or quizzes unless directly allowed by the instructor.

### Course Mapping:

<b>Week One: Functions and their Graphs Part 1 (LO4)</b>	
<b>Learning Activities and Materials</b>	<b>Assessments</b>
<p>Read:</p> <ul style="list-style-type: none"> <li>- <a href="#">Chapter 1: Review (Section 1 - Section 4)</a> (~40 pages) <b>(LO4)</b></li> <li>- <a href="#">What is a function?</a> (~5 pages) <b>(LO4)</b></li> <li>- <a href="#">Equation of a Straight Line</a> (~2 pages) <b>(LO4)</b></li> <li>- <a href="#">Composition of Functions</a> (~3 pages) <b>(LO4)</b></li> <li>- <a href="#">Laws of Exponents</a> (~5 pages) <b>(LO4)</b></li> </ul> <p>Watch:</p> <ul style="list-style-type: none"> <li>- <a href="#">Introduction to Functions - Part 1</a> (12:14 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Introduction to Functions - Part 2</a> (10:03 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Graphing 9 Basic Functions</a> (8:21 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Interval Notation</a> (8:00 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Domain and Range</a> (10:19 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Composite Functions</a> (8:55 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Ex: Decompose Functions</a> (5:58 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Functions Transformations: A Summary</a> (8:19 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Rate and Slope</a> (9:43 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Graphing a Line in Slope-Intercept Form</a> (7:06 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Properties of Exponents</a> (9:44 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Negative Exponents</a> (10:11 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Ex: Write a Radical in Rational Exponent Form</a> (2:37 Minutes) <b>(LO4)</b></li> </ul>	<p><b>Introduction Forum:</b></p> <ul style="list-style-type: none"> <li>- Introduce yourself to the class by creating an infographic. At a minimum, please share your professional experience, future aspirations, and an interesting fact about yourself.</li> </ul> <p><b>Assignment:</b></p> <ul style="list-style-type: none"> <li>- Discussion Forum 1: Create an infographic that summarizes the laws of exponents. Be sure to include three examples. (Moodle) <b>(LO4)</b></li> <li>- Drag-and-Drop Key Terms Review 1 (Moodle) <b>(LO4)</b></li> <li>- Section 1.1 Homework (Moodle) <b>(LO4)</b></li> <li>- Section 1.2 Homework (Moodle) <b>(LO4)</b></li> <li>- Section 1.3 Homework (Moodle) <b>(LO4)</b></li> <li>- Section 1.4 Homework (Moodle) <b>(LO4)</b></li> <li>- Paper 1 – Write a one-page paper that describes real-life applications of linear functions. (Moodle) <b>(LO4)</b></li> <li>- Quiz 1 (Section 1.1 – 1.4) (Moodle) <b>(LO4)</b></li> </ul>
<b>Week Two: Functions and their Graphs Part 2 (LO4)</b>	
<b>Learning Activities and Materials</b>	<b>Assessments</b>

<p>Read:</p> <ul style="list-style-type: none"> <li>- <a href="#">Chapter 1: Review (Section 5 - Section 8)</a> (~27 pages) <b>(LO4)</b></li> <li>- <a href="#">Quadratic Equations</a> (~8 pages) <b>(LO4)</b></li> <li>- <a href="#">Polynomials</a> (~5 pages) <b>(LO4)</b></li> <li>- <a href="#">Rational Expressions</a> (~11 pages) <b>(LO4)</b></li> <li>- <a href="#">Exponential Function Reference</a> (~3 pages) <b>(LO4)</b></li> <li>- <a href="#">Logarithmic Function Reference</a> (~3 pages) <b>(LO4)</b></li> </ul> <p>Watch:</p> <ul style="list-style-type: none"> <li>- <a href="#">Graphing Quadratic Functions in General Form</a> (9:14 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Graphing Quadratic Functions in Standard Form (Vertex Form)</a> (9:00 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Ex 1: Solve a Quadratic Equation Graphically on Calculator</a> (5:58 Minutes) <b>(LO4)</b></li> <li>- <a href="#">The Quadratic Formula</a> (7:43 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Turning Points and X Intercepts of a Polynomial Function</a> (5:31 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Ex: Find the Intercepts of a Polynomial Function in Factored Form</a> (3:16 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Ex 1: Solve a Polynomial Inequality in Factored Form</a> (6:12 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Graph Rational Functions</a> (10:14 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Determining Vertical and Horizontal Asymptotes of Rational Functions</a> (11:29 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Graphing Basic Exponential Functions: Growth and Decay</a> (9:18 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Exponential Function Application (y=ab^x) - Population Growth of India</a> (4:23 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Exponential Function Application (y=ae^(kt)) - Bacteria Growth</a> (2:36 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Compounded Interest</a> (7:11 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Introduction to Logarithms</a> (7:41 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Ex: Evaluate Natural Logarithms on the Calculator</a> (2:49 Minutes) <b>(LO4)</b></li> <li>- <a href="#">The Properties of Logarithms</a> (8:36 Minutes) <b>(LO4)</b></li> </ul>	<p><b>Assignment:</b></p> <ul style="list-style-type: none"> <li>- Discussion Forum 2: Create an infographic that reflects the essential functions learned this week such as polynomials, exponential functions, and logarithmic functions. Please include a graph of each function. (Moodle) <b>(LO4)</b></li> <li>- Drag-and-Drop Key Terms Review 2 (Moodle) <b>(LO4)</b></li> <li>- Section 1.5 Homework (Moodle) <b>(LO4)</b></li> <li>- Section 1.6 Homework (Moodle) <b>(LO4)</b></li> <li>- Section 1.7 Homework (Moodle) <b>(LO4)</b></li> <li>- Section 1.8 Homework (Moodle) <b>(LO4)</b></li> <li>- Paper 2 – Write a one-page paper that describes real-life applications of logarithmic functions. (Moodle) <b>(LO4)</b></li> <li>- Quiz 2 (Section 1.5 – 1.8) (Moodle) <b>(LO4)</b></li> <li>- Exam 1 (Section 1.1 – 1.8) (Moodle) <b>(LO4)</b></li> </ul>
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<ul style="list-style-type: none"> <li>- <a href="#">Ex: Graph an Exponential Function and Logarithmic Function</a> (6:01 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Solving Exponential Equations - Part 2 of 2</a> (9:54 Minutes) <b>(LO4)</b></li> <li>- <a href="#">Ex: Find the Domain of Logarithmic Functions</a> (4:36 Minutes) <b>(LO4)</b></li> </ul>	
<b>Week Three: Limits and Continuity (LO1), The Derivative (LO2), and Rates in Real Life (LO3)</b>	
<b>Learning Activities and Materials</b>	<b>Assessments</b>

<p><b>Read:</b></p> <ul style="list-style-type: none"> <li>- <a href="#">Chapter 2: The Derivative (Section 1 - Section 2)</a> (~12 pages) <b>(LO1)</b></li> <li>- <a href="#">Slope of a Straight Line</a> (~4 pages) <b>(LO1)</b></li> <li>- <a href="#">Tangent Lines and Secant Lines</a> (~1 pages) <b>(LO1)</b></li> <li>- <a href="#">Speed and Velocity</a> (~5 pages) <b>(LO1)</b></li> <li>- <a href="#">Continuous Functions</a> (~7 pages) <b>(LO1)</b></li> <li>- <a href="#">Limits</a> (~7 pages) <b>(LO1)</b></li> <li>- <a href="#">Chapter 2: The Derivative (Section 3 - Section 4)</a> (~12 pages) <b>(LO2) (LO3)</b></li> <li>- <a href="#">Introduction to Derivatives</a> (~6 pages) <b>(LO2)</b></li> <li>- <a href="#">The Definition of the Derivative</a> (~3 pages) <b>(LO2)</b></li> <li>- <a href="#">Interpretation of the Derivative</a> (~3 pages) <b>(LO3)</b></li> </ul> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>- <a href="#">Average Rate of Change</a> (8:28 Minutes) <b>(LO1)</b></li> <li>- <a href="#">Graphical Approach to Average and Instantaneous Rate of Change</a> (10:21 Minutes) <b>(LO1)</b></li> <li>- <a href="#">Ex: Average Rate of Change Application - Hot Air Balloon Function</a> (3:22 Minutes) <b>(LO1)</b></li> <li>- <a href="#">Ex: Use Average Velocity to Predict Instantaneous Velocity</a> (5:08 Minutes) <b>(LO1)</b></li> <li>- <a href="#">Introduction to Limits</a> (8:46 Minutes) <b>(LO1)</b></li> <li>- <a href="#">Continuity using Limits</a> (3:16 Minutes) <b>(LO1)</b></li> <li>- <a href="#">Introduction to the Derivative</a> (9:56 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Ex 1: Estimate the Value of a Derivative at a Point on a Graph Using a Tangent Line</a> (2:58 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Ex: Determine the Open Intervals Where the First Derivative is Positive or Negative</a> (2:33 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Ex: Determine the Linear Cost Revenue, and Profit Functions From a Story</a> (4:58 Minutes) <b>(LO3)</b></li> <li>- <a href="#">Ex: Determine a Linear Demand Function</a> (5:00 Minutes) <b>(LO3)</b></li> <li>- <a href="#">Ex: Determine Total Cost and Marginal Cost (No Derivative)</a> (4:12 Minutes) <b>(LO3)</b></li> </ul>	<p><b>Assignment:</b></p> <ul style="list-style-type: none"> <li>- Discussion Forum 3: Create an infographic that explains limits. Be sure to include definitions and visual diagrams! (Moodle) <b>(LO1)</b></li> <li>- Drag-and-Drop Key Terms Review 3 (Moodle) <b>(LO1)</b></li> <li>- Section 2.1 Homework (Moodle) <b>(LO1)</b></li> <li>- Section 2.2 Homework (Moodle) <b>(LO1)</b></li> <li>- Paper 3 – Write a one-page paper that describes real-life applications of average rates of change and how you may use the concept in your everyday life. (Moodle) <b>(LO1)</b></li> <li>- Quiz 3 (Section 2.1 – 2.2) (Moodle) <b>(LO1)</b></li> <li>- Discussion Forum 4: Create an infographic that contains and explains the Business and Economic Terms in Section 4: Rates in Real Life. (Moodle) <b>(LO3)</b></li> <li>- Drag-and-Drop Key Terms Review 4 (Moodle) <b>(LO2) (LO3)</b></li> <li>- Section 2.3 Homework (Moodle) <b>(LO2)</b></li> <li>- Section 2.4 Homework (Moodle) <b>(LO3)</b></li> <li>- Paper 4 – Write a one-page paper that describes real-life applications of derivatives. (Moodle) <b>(LO2) (LO3)</b></li> <li>- Quiz 4 (Section 2.3 – 2.4) (Moodle) <b>(LO2) (LO3)</b></li> </ul>
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<b>Week Four: Derivatives of Formulas (LO2), The Second Derivative (LO2), and Optimization (LO3)</b>	
<b>Learning Activities and Materials</b>	<b>Assessments</b>

<p><b>Read:</b></p> <ul style="list-style-type: none"> <li>- <a href="#">Chapter 2: The Derivative (Section 5)</a> (~13 pages) <b>(LO2)</b></li> <li>- <a href="#">Power Rule</a> (~3 pages) <b>(LO2)</b></li> <li>- <a href="#">Product Rule</a> (~3 pages) <b>(LO2)</b></li> <li>- <a href="#">Derivative Rules</a> (~11 pages) <b>(LO2)</b></li> <li>- <a href="#">Chain Rule</a> (~6 pages) <b>(LO2)</b></li> <li>- <a href="#">Differentiable</a> (~5 pages) <b>(LO2)</b></li> <li>- <a href="#">Chapter 2: The Derivative (Section 6 and Section 7)</a> (~16 pages) <b>(LO2)</b> <b>(LO3)</b></li> <li>- <a href="#">Second Derivative</a> (~5 pages) <b>(LO2)</b></li> <li>- <a href="#">Concave Upward and Downward</a> (~5 pages) <b>(LO2)</b></li> <li>- <a href="#">Inflection Points</a> (~4 pages) <b>(LO2)</b></li> <li>- <a href="#">Finding Maxima and Minima using Derivatives</a> (~7 pages) <b>(LO3)</b></li> <li>- <a href="#">Optimization</a> (~7 pages) <b>(LO3)</b></li> </ul> <p><b>Watch:</b></p> <ul style="list-style-type: none"> <li>- <a href="#">Differentiation Techniques: Power Rule</a> (8:45 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Derivatives of Exponential Functions with Base e</a> (10:17 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Ex 1: Derivatives Involving the Exponential Function with Base e</a> (3:48 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Derivative of the Logarithmic Function</a> (9:44 Minutes) <b>(LO2)</b></li> <li>- <a href="#">The Product Rule of Differentiation (Introduction)</a> (9:41 Minutes) <b>(LO2)</b></li> <li>- <a href="#">The Quotient Rule</a> (7:20 Minutes) <b>(LO2)</b></li> <li>- <a href="#">The Chain Rule of Differentiation: Part 1 of 2</a> (8:44 Minutes) <b>(LO2)</b></li> <li>- <a href="#">The Chain Rule of Differentiation: Part 2 of 2</a> (8:35 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Marginals</a> (8:10 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Determining where a function is increasing and decreasing using the first derivative</a> (10:04 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Higher-Order Derivatives: Part 1 of 2</a> (7:33 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Higher-Order Derivatives: Part 2 of 2</a> (5:20 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Determining the concavity of a function</a> (10:01 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Animation: The graph of a function and it's 1st and 2nd Derivative</a> (5:12 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Finding relative extrema using the first derivative</a> (6:18 Minutes) <b>(LO2)</b></li> <li>- <a href="#">The second derivative test to determine relative extrema</a> (8:40 Minutes) <b>(LO2)</b></li> <li>- <a href="#">Absolute Extrema</a> (8:46 Minutes) <b>(LO2)</b></li> </ul>	<p><b>Assignment:</b></p> <ul style="list-style-type: none"> <li>- Discussion Forum 5: Create an infographic that summarizes all the Derivative Rules listed in Section 2.5. Please include an example of each rule. (Moodle) <b>(LO2)</b></li> <li>- Drag-and-Drop Key Terms Review 5 (Moodle) <b>(LO2)</b></li> <li>- Section 2.5 Homework (Moodle) <b>(LO2)</b></li> <li>- Quiz 5 (Section 2.5) (Moodle) <b>(LO2)</b> <b>(LO3)</b></li> <li>- Discussion Forum 6: Create an infographic that reviews the Second Derivative Test. Please include visual guides of concavity and inflection points. (Moodle) <b>(LO2)</b></li> <li>- Drag-and-Drop Key Terms Review 6 (Moodle) <b>(LO2)</b></li> <li>- Section 2.6 Homework (Moodle) <b>(LO2)</b></li> <li>- Section 2.7 Homework (Moodle) <b>(LO3)</b></li> <li>- Paper 5 – Create a real-life application optimization problem. Create a visual diagram and explain, step-by-step how the problem is solved. (Moodle) <b>(LO2)</b> <b>(LO3)</b></li> <li>- Quiz 6 (Section 2.6 – Section 2.7) (Moodle) <b>(LO2)</b> <b>(LO3)</b></li> <li>- Exam 2 (Section 2.1 – 2.7) (Moodle) <b>(LO1)</b> <b>(LO2)</b> <b>(LO3)</b></li> </ul>
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<ul style="list-style-type: none"> <li>- <a href="#">Optimization Problems - Calculus</a> (64:55 Minutes) <b>(LO3)</b></li> </ul>	
<b>Week Five: The Integral Part 1 (LO5)</b>	
<b>Learning Activities and Materials</b>	<b>Assessments</b>
<p>Read:</p> <ul style="list-style-type: none"> <li>- <a href="#">Chapter 3: The Integral (Section 1 and Section 2)</a> (~20 pages) <b>(LO5)</b></li> <li>- <a href="#">Integral Approximations</a> (~10 pages) <b>(LO5)</b></li> <li>- <a href="#">Area Problem</a> (~8 pages) <b>(LO5)</b></li> <li>- <a href="#">Sigma Notation</a> (~2 pages) <b>(LO5)</b></li> <li>- <a href="#">Definite Integrals</a> (~8 pages) <b>(LO5)</b></li> <li>- <a href="#">Computing Definite Integrals</a> (~7 pages) <b>(LO5)</b></li> </ul> <p>Watch:</p> <ul style="list-style-type: none"> <li>- <a href="#">Determining Area Under Graphs Using Geometric Formulas</a> (7:10 Minutes) <b>(LO5)</b></li> <li>- <a href="#">Approximating Area Under a Graph Using Rectangles</a> (9:19 Minutes) <b>(LO5)</b></li> <li>- <a href="#">The Definition of The Definite Integral</a> (9:21 Minutes) <b>(LO5)</b></li> <li>- <a href="#">Ex: Interpret the Meaning of Area Under a Function</a> (3:17 Minutes) <b>(LO5)</b></li> <li>- <a href="#">Introduction to Antiderivatives and Indefinite Integration (No Trig)</a> (11:21 Minutes) <b>(LO5)</b></li> <li>- <a href="#">The Fundamental Theorem of Calculus</a> (9:04 Minutes) <b>(LO5)</b></li> <li>- <a href="#">The Second Fundamental Theorem of Calculus</a> (5:21 Minutes) <b>(LO5)</b></li> </ul>	<p><b>Assignment:</b></p> <ul style="list-style-type: none"> <li>- Discussion Forum 7: Integration can be confusing! Please find a resource that helped you further understand indefinite integrals. Please share this resource and explain why you choose to share it. (Moodle) <b>(LO5)</b></li> <li>- Drag-and-Drop Key Terms Review 7 (Moodle) <b>(LO5)</b></li> <li>- Section 3.1 Homework (Moodle) <b>(LO5)</b></li> <li>- Section 3.2 Homework (Moodle) <b>(LO5)</b></li> <li>- Paper 6 – Write a one-page paper that describes real-life applications of integration. (Moodle) <b>(LO5)</b></li> <li>- Quiz 7 (Section 3.1 – Section 3.2) (Moodle) <b>(LO5)</b></li> </ul>
<b>Week Six: The Integral Part 2 (LO5)</b>	
<b>Learning Activities and Materials</b>	<b>Assessments</b>

<p>Read:</p> <ul style="list-style-type: none"> <li>- <a href="#">Chapter 3: The Integral (Section 3 and Section 4)</a> (~11 pages) <b>(LO5)</b></li> <li>- <a href="#">Integration Rules</a> (~6 pages) <b>(LO5)</b></li> <li>- <a href="#">Substitution Rule for Indefinite Integrals</a> (~6 pages) <b>(LO5)</b></li> <li>- <a href="#">Substitution Rule for Definite Integrals</a> (~3 pages) <b>(LO5)</b></li> </ul> <p>Watch:</p> <ul style="list-style-type: none"> <li>- <a href="#">The Antiderivative</a> (10:23 Minutes) <b>(LO5)</b></li> <li>- <a href="#">Antiderivatives</a> (33:49 Minutes) <b>(LO5)</b></li> <li>- <a href="#">U-substitution With Definite Integrals</a> (11:02 Minutes) <b>(LO5)</b></li> <li>- <a href="#">How To Integrate Using U-Substitution</a> (21:34 Minutes) <b>(LO5)</b></li> </ul>	<p><b>Assignment:</b></p> <ul style="list-style-type: none"> <li>- Discussion Forum 8: It's the last week of class! Please share the essential calculus topic that you found most interesting in this class. How will you use this topic in the future? (Moodle) <b>(LO1) (LO2) (LO3) (LO4) (LO5)</b></li> <li>- Drag-and-Drop Key Terms Review 8 (Moodle) <b>(LO5)</b></li> <li>- Section 3.3 Homework (Moodle) <b>(LO5)</b></li> <li>- Section 3.4 Homework (Moodle) <b>(LO5)</b></li> <li>- Quiz 8 (Section 3.3 – Section 3.4) (Moodle) <b>(LO5)</b></li> <li>- Cumulative Final Exam (Moodle) <b>(LO1) (LO2) (LO3) (LO4) (LO5)</b></li> </ul>
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