

## **Syllabus**

**Course Number: MT330 Course**

**Title: Business Calculus**

### **Course Description:**

Introduces standard topics of calculus, including functions and their graphs, exponential and logarithmic functions, differentiation, and integration, and presents them in the context of examples from the business world.

### **Prerequisite Courses:**

MT 201 (College Algebra) or MT 260 (Pre-Calculus)

### **Course Overview**

Many aspects of business benefit from a mathematical perspective. Analysis of data and mathematical modeling allow businesses to make more effective decisions. In this class we will focus on mathematical modeling and using mathematics to analyze quantities that naturally occur in business, like profit, cost, revenue, and so on. When these quantities are changing, that's when calculus comes into play. Differential calculus is the study of rates of change. We will learn the basics of differential calculus and some of the many applications to business applications. We will also explore the role of antiderivatives in calculating accumulated change.

### **Course Outcomes:**

Upon completion of this course, learners should be able to:

- Apply the basics of differential calculus to real world business and scientific applications.
- Explain how derivatives and antiderivatives can be used to determine rates of change.
- Apply mathematical rules to solve calculus problems.

### **Course Materials:**

#### ***Required Texts:***

Lial, M. L., Greenwell, R. N., & Ritchey, N. P. (2014). *Calculus with Applications* 11th edition. Boston, MA: Pearson Education, Inc. ISBN: 9780321979421.

#### ***Required Resources:***

Revised: 9/21/2016

**MyMathLab (MML)** - for information, refer to the Getting Started with MyMathLab (MML) web page link. This link is also located in the Course Resources folder.

**From the Experts – weekly required readings, videos, presentations – see course web page.**

Presentations resources are in the weekly *From the Experts* webpages that are in the *Content* tab. In order to address the weekly Learner Outcomes you will want to read, understand, and synthesize the course content/material from the assigned readings. Then, review the weekly lecture presentation and resources **AFTER** you have completed the readings.

**Technology Tools:**

Minimum Technology Requirements: <http://www.regis.edu/Academics/Learning-Management-System/System-Requirements.aspx>

**Optional Materials:**

None

**Pre-Assignment:**

**Online Format:** Sign on to D2L (Home Page) and become familiar with the course navigation.

**Classroom-based Format:** Instructor will make assignments.

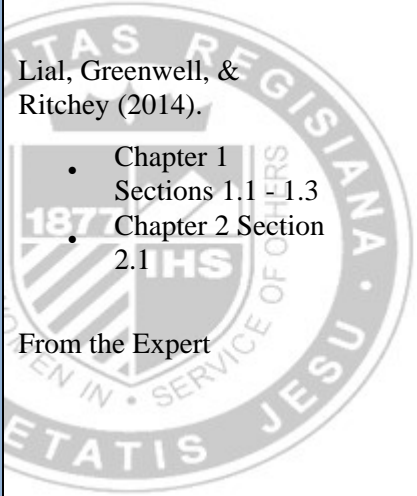
**Pre-Assignment Due Dates:**

**Classroom-based Format:** This assignment is due the first night of class.

**Online Format:** The instructor will specify the due date for this assignment.

**Course Assignments and Activities:**

Week	Topics	Required Readings	Activities/Assignments *see Student Evaluation Grid below for %
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1	Algebra Review	<p>Lial, Greenwell, &amp; Ritchey (2014).</p> <ul style="list-style-type: none"> <li>Chapter R (Algebra Reference) R1-R7</li> </ul> <p>Getting Started with MyMathLab</p> <p>From the Expert</p>	<p>Introductions</p> <p>Discussions</p> <ul style="list-style-type: none"> <li>Intro Paper</li> <li>Discussion Questions</li> </ul> <p>Homework – MyMathLab (MML)</p> <p>Week 1 Quiz (MML)</p>
2	<p>Linear Functions</p> <ul style="list-style-type: none"> <li>Slopes and equations of lines</li> <li>Linear functions and applications</li> <li>Least squares line</li> <li>Properties of functions</li> </ul>	 <p>Lial, Greenwell, &amp; Ritchey (2014).</p> <ul style="list-style-type: none"> <li>Chapter 1 Sections 1.1 - 1.3</li> <li>Chapter 2 Section 2.1</li> </ul> <p>From the Expert</p>	<p>Discussion Questions</p> <p>Homework – MyMathLab (MML)</p> <p>Week 2 Quiz (MML)</p>
3	<p><b>Properties of functions, exponents, and logarithms</b></p> <ul style="list-style-type: none"> <li>Quadratic functions; translation and reflection</li> <li>Polynomial and rational functions</li> <li>Exponential functions</li> <li>Logarithmic functions</li> <li>Applications: Growth and decay; Mathematics of finance</li> </ul>	<p>Lial, Greenwell, &amp; Ritchey (2014).</p> <ul style="list-style-type: none"> <li>Chapter 2 – Sections 2.2 - 2.6</li> </ul> <p>From the Expert</p>	<p>Discussion Questions</p> <p>Homework – MyMathLab (MML)</p> <p>Week 3 Quiz (MML)</p>
4	<p><b>Limits, Continuity, Rates of change</b></p>	<p>Lial, Greenwell, &amp; Ritchey (2014).</p> <ul style="list-style-type: none"> <li>Chapter 3 Sections 3.1 - 3.3</li> </ul> <p>From the Expert</p>	<p>Discussion Questions</p> <p>Homework – MyMathLab (MML)</p> <p>Midterm Exam (MML)</p>

5	<b>Derivatives</b> <ul style="list-style-type: none"> <li>Techniques for finding derivatives</li> <li>Derivatives of products and quotients <ul style="list-style-type: none"> <li>The chain rule</li> <li>Derivatives of exponential functions</li> <li>Derivatives of logarithmic functions</li> </ul> </li> </ul>	Lial, Greenwell, & Ritchey (2014). <ul style="list-style-type: none"> <li>Chapter 4 Sections 4.1 - 4.5</li> </ul> From the Expert	Discussion Questions Homework – MyMathLab (MML) Week 5 Quiz (MML)
6	<b>Higher Derivatives</b> <ul style="list-style-type: none"> <li>Increasing and decreasing functions</li> <li>Relative extrema</li> <li>Higher derivatives, concavity, and the second derivative test</li> </ul>	Lial, Greenwell, & Ritchey (2014). <ul style="list-style-type: none"> <li>Chapter 5 Sections 5.1 – 5.3</li> </ul> From the Expert	Discussion Questions Homework – MyMathLab (MML) Week 6 Quiz (MML)
7	<b>Antiderivatives •</b> Substitution	Lial, Greenwell, & Ritchey (2014). <ul style="list-style-type: none"> <li>Chapter 7 Sections 7.1 – 7.2</li> </ul> From the Expert	Discussion Questions Homework – MyMathLab (MML) Week 7 Quiz (MML)
8	<b>The Fundamental Theorem of Calculus</b> <ul style="list-style-type: none"> <li>The area between two curves</li> </ul>	Lial, Greenwell, & Ritchey (2014). <ul style="list-style-type: none"> <li>Chapter 7 Sections 7.4 – 7.5</li> </ul> From the Expert	Discussion Questions Homework – MyMathLab (MML) Final Exam (MML)
	<b>Total</b>		<b>100%</b>

Student Evaluation Grid:

Assignments	*Weighted Percentage
8 Discussion Questions/Participation (Weeks 1-8)	10%
8 Homework (MML)	30%
6 Quizzes (MML)	30%
Exams (MML) <ul style="list-style-type: none"> <li>• Midterm Exam (15%)</li> <li>• Final Exam (15%)</li> </ul>	30%
<b>Total</b>	<b>100%</b>

### CC&IS Grading Scale

Letter Grade	Percentage	Grade Point
A	93 to 100	4.00
A-	90 to less than 93	3.67
B+	87 to less than 90	3.33
B	83 to less than 87	3.00
B-	80 to less than 83	2.67
C+	77 to less than 80	2.33
C	73 to less than 77	2.00
C-	70 to less than 73	1.67
D+	67 to less than 70	1.33
D	63 to less than 67	1.00
-	60 to less than 63	.67
F	Less than 60	0

Additional information about grading can be found in the latest edition of the University Catalog, available at <http://www.regis.edu/Academics/Course%20Catalog.aspx>.

## Course Policies and Procedures:

Each of the following CC&IS Policies & Procedures is incorporated here by reference. Students are expected to review this information each term, and agree to the policies and procedures as identified here and specified in the latest edition of the University Catalog, available at <http://www.regis.edu/Academics/Course%20Catalog.aspx> or at the link provided.

- The CC&IS Academic Integrity Policy.
- The Student Honor Code and Student Standards of Conduct.
- Incomplete Grade Policy, Pass / No Pass Grades, Grade Reports.
- The Information Privacy policy and FERPA. For more information regarding FERPA, visit the [U.S. Department of Education](http://www.ed.gov).
- The HIPAA policies for protected health information. The complete Regis University HIPAA Privacy & Security policy can be found here: <http://www.regis.edu/About-RegisUniversity/University-Offices-and-Services/Auxiliary-Business/HIPAA.aspx>.
- The Human Subjects Institutional Review Board (IRB) procedures. More information about the IRB and its processes can be found here: <http://regis.edu/Academics/AcademicGrants/Proposals/Regis-InformationIRB.aspx>.

The CC&IS Policies & Procedures Syllabus Addendum summarizes additional important policies including, Diversity, Equal Access, Disability Services, and Attendance & Participation that apply to every course offered by the College of Computer & Information Sciences at Regis University. A copy of the CC&IS Policies & Procedures Syllabus Addendum can be found here: <https://in2.regis.edu/sites/ccis/policies/Repository/CCIS%20Syllabus%20Addendum.docx>.

