MTH 241: Calculus for Biology, Management, Social Science
Fall 2019, CRN: 20187
11:00 A.M. – 12:50 P.M., MW; WOH-120

Instructor: Stanley Leung
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Office hours: Monday: 1:00 – 2:00 P.M. (Albany campus), appointments are welcome.

Course Description:
Introduces calculus as applied to business, the social sciences and life sciences. It uses an intuitive development of the calculus of polynomial, exponential and logarithmic functions, extrema theory and applications.
Prerequisite: MTH 111 College Algebra with a grade of C or better.

MTH 241 Student Learning Outcomes
Upon completion of MTH 241: Calculus for Biological, Management, Social Sciences students will be able to:
1. Identify average and instantaneous rates of change in business and biology applications.
2. Connect graphical, numerical, and symbolic interpretations of the difference quotient and the derivative.
3. Apply differential calculus techniques to describe the behavior of business and biological functions.
4. Apply techniques of integral calculus to determine net changes in business and biological applications such as marginal analysis, velocity, and growth.

Required course materials
- Textbook: *Applied Calculus*, Waner/Costenoble, 7th edition [WebAssign]
- Bring your calculator (TI-83, TI-84), laptop computer to every class meeting.

Class format
The course consists of lectures, discussion/problem solving.

Grading Criteria

Points Allocated		Grade Assignment
The final course grade will be computed as follows:		A: 90 – 100 points B: 80 – 89.99 points C: 70 – 79.99 points D: 60 – 69.99 points F: 0 – 59.99 points
• Homework assignments	35 points	
• Two tests	20 points	
• Five quizzes	10 points	
• In-class assignments	15 points	
• Final examination	20 points	

Grades of Y and WP are not given in this course.

- **Absences and excuses do not improve grades.**
- **Understanding comes after studying.**

"The capacity to learn is a gift; the ability to learn is a skill; the willingness to learn is a choice."
Brian Herbert (American author)

You are expected to observe the following cell-phone policy:

Cell-phone policy: Zero tolerance for cell-phone use in class.

You will be asked to leave the classroom if you use cell phone in class.
All **electronic devices** (except approved medical devices, calculator**) are banned** from our classroom or instructor's office. For more information, consult LBCC cell-phone policy.
This policy gives you a higher chance of success in Math 241.

How to do well in this course?
To do well in this course, **your responsibilities** include: **Attend all class meetings and do all required course work**. Take quizzes, tests and the final examination. Submit homework assignments and in-class assignments on time. Study lecture notes daily. Understand the connections between concepts. Pay close attention to definitions, technical details.

Notice:

- **You are responsible for the material covered, course-related information, and announcements made during the class(es) that you miss.** Even if you are sick, even if your car breaks down, even if your cats have to go to the vet; you are still responsible for all the material you missed in your absence.

Tips for success

- To succeed in Math 241, attendance is essential. Two or more absences can affect your grade, due to missed work, and explanation of concepts.
- Keep up!
- Study your lecture notes and read the textbook. (You are expected to review lecture notes daily.)
- Help will be much more effective and productive if *you know what it is that you don't understand* and if *you bring specific questions from lecture or the book*!
- Use **office hours** to get help from your instructor. Ask questions in class. Use **free tutoring services** on campus. Do not wait. You are encouraged to form teams of two.

In-class assignments
Besides lectures, the instructor provides guided discussion/problem solving to illustrate and reinforce concepts. Students are encouraged to work in *teams of two*. Students studying in teams can improve understanding concepts, acquire learning skills including Excel skills; and make new friends, too.
Notice:

- **To receive credit for in-class assignments, you must be present in class**. No excuses.
- In-class assignments must be turned at the end of that class meeting, unless instructed otherwise.

Homework assignments
Do homework assignments **completely** on your own team (= 1 student or 2 students). You must work on the homework assignments on your own team, independent of other teams in class. **Credit for an assignment is equally divided among those teams for work that has been copied.** This includes computer output when used in the homework assignments. The instructor retains copied homework assignments.

You must hand in your homework assignment at the start of class.
Homework deadline: **5 minutes after the start of class** on the due date.
Notice: The instructor does not accept electronic versions of homework assignments.

Policy on late homework assignments

[1] You are allowed to turn in one late homework assignment (up to **72 hours late**) without penalty. Use it for an emergency only. This 72-hour policy may change when it is close to a test or final exam.
[2] If you turn in your homework assignment later than **11:05 A.M**., you will **lose one point** from the score of the assignment for every minute past the due time. If your assignment is more than 10 minutes late, then option [3] applies.
[3] 1 day late: 90% credit; 11:06 A.M.(due day) to within 24 hours
2 days late: 70% credit; 11:06 A.M. (due day) to within 48 hours
3 days late: 50% credit; 11:06 A.M. (due day) to within 72 hours (After 72 hours, late HW assignments will go to recycle bins.)

Homework Policy

- Use 3 or 4 decimal places for numerical answers if necessary. Units of measurement must be included.
- For **full credit**, show all your **WORK** (problem setup, formulas and steps of calculation, standard procedure, standard notation, units, …). No need to show work for true-false questions, or multiple-choice questions.
- **Correct numerical answers with no WORK receive no credit**.

This policy applies to in-class assignments, homework assignments, tests, and the final examination.

Tests

All tests consist of two parts: in-class tests and take-home tests. In-class tests consist of true-or-false questions, multiple-choice questions, computational problems, short-answer conceptual questions, and data-analysis skills. All in-class tests are closed-book and closed-notes. In-class tests start at 12:00 noon. Take-home tests may include Excel commands. Save the Excel commands from homework assignments.
If you have questions regarding your graded test, you must talk to the instructor within **3 school days** after it is returned to you.
Test 1: Take-home test, Monday, week 4; In-class test: Wednesday, week 4
Test 2: Take-home test, Monday, week 8; In-class test: Wednesday, week 8

Policy on tests:

- Make-up tests will not be given under any circumstances.
- If you missed a test and have a **documented reason** or **verifiable emergency**, the credit for the test will be transferred to the final exam. That is, the credit for your final exam is 35 (= 20 + 15) points.
- You must not use cell phones or cell-phone calculators during tests, or the final examination.

Quizzes

You will have 5 quizzes. The topics for a quiz will be announced on Moodle. Quiz time: 12:35 – 12:50 P.M., **Wednesday**. Quiz dates: Weeks 2, 3, 5, 6, 7. No make-up quizzes.

Final Examination

The final examination is comprehensive and covers all lectures through the end of the fall quarter. This is an open-book and open-notes exam. The final exam consists of true-or-false questions, multiple-choice questions, conceptual questions, computational problems, and data-analysis skills. **No make-up final examination**.

Incomplete Policy

- If you are **passing the course** (C or above) **and** have a **documented reason** or **verifiable emergency** for not being able to complete the course, I may be able to grant you an incomplete. You must obtain my written agreement if you wish to have a grade of incomplete recorded.
- If you miss the final exam, are passing Math 241 and have a **documented reason** or **verifiable emergency**, you will be given an Incomplete. If you miss the final exam and your absence is unexcused, you will receive whatever grade you have earned by your total points (maximum 80) prior to the final exam.

Special Circumstances:

Students who have any emergency medical information the instructor should know of, who need special arrangements in the event of evacuation, or students with documented disabilities who may need accommodations, should **make an appointment with the instructor as early as possible, no later than the first week of the term.**

Request for Special Needs or Accommodations

You should meet with your instructor during the first week of class if:

1. You have a documented disability and need accommodations.
2. Your instructor needs to know medical information about you.
3. You need special arrangements in the event of an emergency.

If you have documented your disability, remember that you must make your request for accommodations through the Center for Accessibility Resources (CFAR) Online Services webpage every term in order to receive accommodations. If you believe you may need accommodations but are not yet registered with CFAR, please visit the CFAR Website for steps on how to apply for services or call 541-917-4789.

Center for Accessibility Resources

Main Office, Red Cedar Hall 105 (RCH-105)
Monday-Friday 9:00 a.m. - 3:00 p.m.
Phone: (541) 917-4789 Email: cfar@linnbenton.edu

Support Lab, Red Cedar Hall 114 (RCH-114)
Monday-Friday 8:00 a.m. - 3:00 p.m.
Phone: (541) 917-4343 Email: cfarlab@linnbenton.edu

The LBCC Center for Accessibility Resources and YOU!

The Center for Accessibility Resources provides assistance to students who have documented disabilities by:

- Reviewing documentation, provided by the student, that provides evidence of disability
- Planning reasonable accommodations
- Coordinating services in the classroom
- Providing support (i.e. assistive technology, testing accommodations, and classroom accommodations)
- Success coaching and advocating

If you have a disability and feel that you will need accommodations as a student at Linn-Benton Community College, we are here to support you.

LBCC Comprehensive Statement of Nondiscrimination

LBCC prohibits unlawful discrimination based on race, color, religion, ethnicity, use of native language, national origin, sex, sexual orientation, gender, gender identity, marital status, disability, veteran status, age, or any other status protected under applicable federal, state, or local laws. For further information see Board Policy P1015 in our Board Policies and Administrative Rules. Title II, IX, & Section 504: Scott Rolen, CC-108, 541-917-4425; Lynne Cox, T-107B, 541-917-4806, LBCC, Albany, Oregon. To report: linnbenton-advocate.symplicity.com/public report

Brief Basic Needs Statement:
Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Roadrunner Resource Center for support (resources@linnbenton.edu , or visit us on the web www.linnbenton.edu/RRC under Student Support for Current Students). Our office can help students get connected to resources to help. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to provide any resources that they may possess.

Your instructor is a fair dictator! ☺

- To be fair to all students in Math 241, the instructor strictly enforces the course policies. For individual situations not covered in the course policies, the instructor will act at his discretion. Additional information relating to the course material or assignments will be handed out or announced in class. **You are responsible for the material covered, course-related information, and announcements made during the class(es) that you miss**.
- The instructor does not use class time to return graded assignments, and tests.

Important:

- Class notes, homework assignments, solutions, announcements, and review materials are stored on Moodle.
- Make sure that you check Moodle for class-related materials at least 3 times a week.

☺ I hope you will enjoy your *guided tour* through the wonderland of Math 241. ☺

Tentative Course Outline

Chapter 1: Functions and Applications
1.1: Functions from the Numerical, Algebraic, and Graphical Viewpoints (54)
1.2: Functions and Models (56)
1.3: Linear Functions and Models (82)
1.4: Linear Regression (29)
1: Review Exercises (22)
Chapter 2: Nonlinear Functions and Models
2.1: Quadratic Functions and Models (35)
2.2: Exponential Functions and Models (58)
2.3: Logarithmic Functions and Models (50)
2.4: Logistic Functions and Models (24)
2: Review Exercises (21)
Chapter 3: Introduction to the Derivative
3.1: Limits: Numerical and Graphical Viewpoints (37)
3.2: Limits and Continuity (35)
3.3: Limits and Continuity: Algebraic Viewpoint (74)
3.4: Average Rate of Change (40)
3.5: The Derivative: Numerical and Graphical Viewpoints (64)
3.6: The Derivative: Algebraic Viewpoint (41)
3: Review Exercises (27)
Chapter 4: Techniques of Differentiation with Applications
4.1: Derivatives of Powers, Sums, and Constant Multiples (66)
4.2: A First Application: Marginal Analysis (32)
4.3: The Product and Quotient Rules (67)
4.4: The Chain Rule (61)
4.5: Derivatives of Logarithmic and Exponential Functions (69)
4.6: Implicit Differentiation (44)
4: Review Exercises (32)
Chapter 5: Further Applications of the Derivative
5.1: Maxima and Minima (48)
5.2: Applications of Maxima and Minima (57)
5.3: Higher Order Derivatives: Acceleration and Concavity (46)
5.4: Analyzing Graphs (27)
5.5: Related Rates (39)
5.6: Elasticity (30)
5: Review Exercises (19)
Chapter 6: The Integral
6.1: The Indefinite Integral (56)
6.2: Substitution (65)
6.3: The Definite Integral: Numerical and Graphical Viewpoints (48)
6.4: The Definite Integral: Algebraic Viewpoint and the Fundamental Theorem of Calculus (67)
6: Review Exercises (28)