
**Course Number and Name:** MAT 146 section name - *Brief Calc With Appl*
**Term Dates:** Sep 7, 2022 - Dec 23, 2022
**Meeting Location:** section Meeting Building section Meeting Room
**Meeting Days & Times:** section Meeting Days; section Start Time - section End Time
**Lecture/Lab Hours:** 3.00 Lecture Hours
**Credits:** 3.00
**Prerequisite(s):** ENG-097; MAT-143
**Corequisite(s):** course Coreqs
**Course Description:** This course is an elementary course in the application of the fundamentals of calculus to the management, social, and life sciences. Topics include limits, continuity, differentiation, maxima, minima, integration of elementary functions, and applications.

## Course Learning Outcomes

**Upon successful completion of this course, students will be able to:**

- Apply functions, operations with functions, limits, and continuity.
- Apply the concept of the limit definition of a derivative, rules of derivatives, and higher order derivatives.
- Apply the rules of derivatives to applications involving business, biology, and physics.
- Apply the concept of the family of antiderivatives to area.

## Course Materials

**WebAssign Printed Access Card for Larson's Calculus: An Applied Approach, 10th Edition, Single-Term**
Texts and software are subject to change, including updates to current editions; check with your specific course instructor prior to purchasing the text. Appropriate software and materials are required to support online instruction. No devise with calculator “apps” are allowed. No other electronic device is permitted.

**Use of the Academic Learning Center (ALC) specifically the Mathematics Success Center (MSC), for extra tutoring assistance is recommended.**

## Course Requirements

- The Mathematics Department adheres to the College attendance policy, which can be found at http://owlsnest.ucc.edu/academics/Policies/Pages/Attendance.aspx. Attendance is required to properly learn the material and meet course expectations.
- Completion of assigned homework.
- Exams and/or quizzes.
- A cumulative final exam is required.

Online students must have system requirements, required software, and technology competency, and are required to take proctored exams, presenting the instructor with a valid photo ID.

## Evaluation Methods

- Homework
- Classwork
- Quizzes
- Tests
- Projects
- Final Exam

## Grading

| Letter Grade | Percentage |
|---|---|
| A | 90-100 |
| B+ | 87-89 |
| B | 80-86 |
| C+ | 77-79 |
| C | 70-76 |
| D+ | 67-69 |
| D | 60-66 |
| F | < 60 |

## Class Schedule

| CLASS MTGS. | TEXT ASSIGNMENT CHAP. | PAGES | TOPICS | ASSIGNMENT PROBLEMS OR QUESTIONS |
|---|---|---|---|---|
| ½ | A.4 | A.19 - A.24 | Factoring Polynomials | P. A.24; 1-55 odd |
| ½ | A.5 | A.25 - A.32 | Fractions and Rationalization | P. A.31; 13-19 odd, 23-41 odd |

| CLASS MTGS. | TEXT ASSIGNMENT CHAP. | PAGES | TOPICS | ASSIGNMENT PROBLEMS OR QUESTIONS |
|---|---|---|---|---|
| 1 ½ | 1.4 | 35-47 | Functions | P. 44; 1-7 odd, 3-16 all, 25, 29-37 odd, 41, 45, 53, 59, 67, 71 |
| 1 ½ | 1.5 | 48-59 | Limits | P. 57; 1-7 odd, 13-57 odd |
| 1 ½ | 1.6 | 60-79 | Continuity | P. 67; 1-49 odd, 57 |
| 1 | 2.1 | 80-90 | The Derivative and the Slope of a Graph | P. 88; 7, 9, 11, 17-39 odd, 41-49 odd, 53-59 odd |
| ½ | | | REVIEW | |
| 1 | | | TEST 1 | |

| CLASS MTGS. | TEXT ASSIGNMENT CHAP. | PAGES | TOPICS | ASSIGNMENT PROBLEMS OR QUESTIONS |
|---|---|---|---|---|
| 1 ½ | 2.2 | 91-102 | Some Rules for Differentiation | P. 100; 1-61 eoo (every other odd), 63, 65, 67 |
| 2 | 2.3 | 103-116 | Rates of Change: Velocity and Marginals | P. 113; 13, 17, 27 |
| 2 | 2.4 | 117-126 | The Product and Quotient Rules | P. 124; 1-55 eoo |
| 1 ½ | 2.5 | 128-136 | The Chain Rule | P. 135; 7-37 odd, 47-61 odd, 69 |
| 1 | 2.6 | 137-143 | Higher Order Derivatives | P. 142; 1, 7, 11, 15, 21, 33, 34 |
| ½ | | | REVIEW | |
| 1 | | | TEST 2 | |

| CLASS MTGS. | TEXT ASSIGNMENT CHAP. | PAGES | TOPICS | ASSIGNMENT PROBLEMS OR QUESTIONS |
|---|---|---|---|---|
| 1 | 3.1 | 168-176 | Increasing & Decreasing Functions | P. 175; 11-37 odd |
| 2 | 3.2 | 177-185 | Extrema and the First Derivative Test | P. 184; 1-11 odd, 19-29 odd, 41 |
| 2 | 3.5 | 205-214 | Business & Economics Applications | P. 212; 3, 9, 17, 21, 25 |
| 1 | 4.1 | 252-257 | Exponential Functions | P. 256; 1-5 odd, 19-25 odd, 22 |
| 1 | 4.2 | 258-266 | Natural Exponential Functions | P. 264; 1-4 all, 35, 37 |
| ½ | | | REVIEW | |
| 1 | | | TEST 3 | |
| 1 | 4.3 | 267-274 | Derivatives of Exponential Functions | P. 273; 1-25 odd, 31, 39, 41 |
| 1 | 4.4 | 276-284 | Logarithmic Functions | P. 282; 1-7 odd, 9-12 all, 15-33 odd, 43, 47, 51, 53, 57, 61 |

| CLASS MTGS. | TEXT ASSIGNMENT<br><br>CHAP. | <br><br>PAGES | TOPICS | ASSIGNMENT<br><br>PROBLEMS OR QUESTIONS |
|---|---|---|---|---|
| 2 | 4.5 | 285-293 | Derivatives of Logarithmic Functions | P. 291; 1-49 odd, 59-63 odd |
| 2 | 4.6 | 294-301 | Exponential Growth and Decay | P. 299; 1-19 odd, 23-29 odd, 33, 45 |
| 2 | 5.1 | 312-321 | Antiderivatives and Indefinite Integrals | P. 319; 1-35 odd, 39, 41-53 odd, 59 |
| 1 | 5.2 | 322-330 | The General Power Rule | P. 329; 1-33 odd, 35-45 odd |
| 2 | 5.3 | 331-337 | Exponential and Logarithmic Integrals | P. 336; 1-45 odd |
| 1 | 5.4 | 339-350 | Area and the Fundamental Theorem of Calculus (skip if needed) | P. 3348; 1-23 odd, 27-39 odd, 43, 45, 49 |
| ½ | | | REVIEW | |
| 1 | | | Test 4 | |

| CLASS MTGS. | TEXT ASSIGNMENT<br><br>CHAP. PAGES | | TOPICS | ASSIGNMENT<br><br>PROBLEMS OR QUESTIONS |
|---|---|---|---|---|
| 2 | | | Review for Final | |

## Experiential Learning

Students must complete an experiential learning activity that connects course content to career applications. This activity may be a content specific assignment or practical skill that is applied within a course assignment. This assignment supports the general education learning outcomes of scientific/critical thinking and quantitative reasoning; oral and written communication; and information literacy/technological competency.

## Academic Policies

See College Catalog for more information: http://onlinecatalog.ucc.edu/content.php?catoid=9&navoid=2335

## Americans with Disabilities Act (ADA)

Union College offers reasonable accommodations and/or services to persons with disabilities. Any student who has a documented disability and wishes to self-identify should contact the Coordinator of Disability Support Services at (908) 709-7164, or email disabilitysvc@ucc.edu. Accommodations are individualized and in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1992. In order to receive accommodations, students must be registered with Disability Support Services. Students should register with the office as soon as possible. Accommodations are not official until the Faculty Accommodations Alert Form(s) are issued from the student to his/her instructor(s).

## Family Educational Rights and Privacy Act (FERPA)

The FERPA Statement can be found at https://www.ucc.edu/admissions/the-family-education-rights-and-privacy-act/.

## Equal Opportunity Statement

Union College does not discriminate and prohibits discrimination, as required by state and/or federal law, in all programs and activities, including employment and access to its career and technical programs.

## Union College Mission Statement

***Transforming Our Community. . . One Student at a Time***

## Suggested Teaching Methodologies

Material is presented in a lecture format incorporating many examples. It is recommended that time be set aside for problem solving in teams or independently.

## Mapping Course Learning Outcomes to Learning Activities and Evaluation Methods

| **Course Learning Outcomes (CLO's)** | **Learning Activities** | **Evaluation Methods** |
|---|---|---|
| Apply functions, operations with functions, limits, and continuity. | Read text and watch supplemental videos<br>Practice problems<br>Lecture<br>Group discussions<br>Classroom demonstration | Chapter quizzes<br>Chapter Exercises & Problems<br>Tests<br>Final Exam |
| Apply the concept of the limit definition of a derivative, rules of derivatives, and higher order derivatives | Read text and watch supplemental videos<br>Practice problems<br>Lecture<br>Group discussions<br>Classroom demonstration | Chapter quizzes<br>Chapter Exercises & Problems<br>Tests<br>Final Exam |
| Apply the rules of | Read text and watch | Chapter quizzes |

| | | |
|---|---|---|
| derivatives to applications involving business, biology, and physics. | supplemental videos<br>Practice problems<br>Lecture<br>Group discussions<br>Classroom demonstration | Chapter Exercises & Problems<br>Tests<br>Final Exam |
| Apply the concept of the family of antiderivatives to area. | Read text and watch supplemental videos<br>Practice problems<br>Lecture<br>Group discussions<br>Classroom demonstration | Chapter quizzes<br>Chapter Exercises & Problems<br>Tests<br>Final Exam |

***Please note:*** *all programs must integrate in one or more courses, discipline-specific course learning outcomes that reflect the College learning outcomes of scientific/critical thinking and quantitative reasoning, oral/written communication, and information literacy.*