

**Fall, 2014**

**CLASS:** MAT 151-006 10-10:50 MWF BR 106

**INSTRUCTOR:** Dr. Kenneth Gurganus ([gurganus@uncw.edu](mailto:gurganus@uncw.edu)) **OFFICE:** BR 201A **PHONE:** 962-3297

**Required TEXT:** *Calculus with Applications*, 10<sup>th</sup> edition, by Lial, Greenwell and Ritchey (2012)

Available in a variety of formats: hardback, looseleaf, and on line.

An on-line version comes with MyMathLab student access: [www.MyMathLab.com](http://www.MyMathLab.com)

**On-Line Component:** MyMathLab (Student access code comes with text if purchased at UNCW bookstore.) This includes an electronic copy of the text and access to on-line homework, a student's solutions manual, video lectures, PowerPoint outlines, and remedial help. Use of the on-line component is optional. MyMathLab course ID for my MAT 151 classes: **gurganus64816**

**SYLLABUS with tentative hour test dates:**

Sections 1.1 & 1.2, 2.1-2.6,3.1-3.5.....Wednesday, September 17

Sections 4.1-4.5, 5.1-5.4, 6.1.....Monday, October 20

Sections 6.2, 6.4-6.6, 7.1-7.5.....Friday, November 21

Final Exam (cumulative): .....Monday, December 8, 8-11 AM in BR 101

**Other important dates:**

Wednesday, August 20—first day of classes;

Monday, September 1; Monday, Oct. 13 & Tuesday, Oct. 14; Wednesday, Thursday & Friday, Nov. 26-28---no classes;

Wednesday, August 27—last day to add or drop without grade;

Wednesday., October 8—last day to withdraw for undergraduates;

Wednesday, December 3—last day of classes;

Thursday, December 4 –Reading Day

The class period before each test will contain a review/problem session.

**Office Hours:** 8:30-8:50 AM MTWRF, 10-10:50 TR and 2-3 MWF with additional times by arrangement. These hours are subject to change during the semester. If you see me and need help regardless of the time, just ask.

**Grading:** Each of the hour tests and the final will be graded on a ten point scale:

90-100 A; 80-89 B; 70-79 C; 60-69 D.

If I feel it is justified, some adjustment downward may be made at times.

"Plus or minus grading may be awarded at the discretion of the faculty [Undergraduate Catalogue]."

The hour test average will count approximately 65% of the final grade and the final exam approximately 25%.

**Homework** will be regularly assigned but generally not collected only because you should do much more homework than I can possibly have graded. You will be notified in advance that some assignments will be collected and graded. Other graded assignments of generally no more than one or two problems may be assigned, done, and collected within a single class meeting with or without prior notice. They may be open or closed book assignments. Such assignments along with graded homework will account for approximately 10% of the final grade. If you choose to use MyMathLab and your average there is higher than the average of your other homework, I will take the mean of the two scores to count for 10% of the final grade.

**Attendance** is to be regularly taken and is expected of every student. It is definitely your responsibility to learn all material covered and this can best be achieved by regular class attendance and by keeping up with the daily pace of the class.

**Make-up tests** will not be given unless you have a reason for missing a test that I determine valid. Even then I reserve the option of using the corresponding portion of the final exam for a make-up test. If you know that you will miss a test, let me know before the test if possible. In any case, inform me as soon as possible.

**The final exam** will cover the entire course and will be graded two ways. The entire final exam grade will count approximately 25% of the final grade. If there is improvement over any hour test grade (or homework average), that hour test grade will be replaced by the weighted average of the final exam grade and the test grade with the higher exam grade weighted three times more than the hour test grade.

**Students with Disabilities:** If you have a disability and need reasonable accommodation in this course, you should inform me of this fact in writing within the first week of class or as soon as possible. If you have not already done so, you must register with the Office of Disability Services in DePaolo Hall (extension 7555) and obtain a copy of your Accommodation Letter. You should then meet with me to make mutually agreeable arrangements based on the recommendations of the Accommodation Letter.

**UNCW's Academic Honor Code** applies to all members of the university community. All students are expected to read and abide by the Academic Honor Code that is in the Student Handbook and Code of Student Life.

**Technology:** A TI-83 or 84 graphing calculator is recommended in this course. The purpose of using a graphing calculator is to clarify and reinforce concepts, as a means of discovery, and as an efficient problem-solving tool.

### **Course Catalog Description: MAT 151-152 Basic Calculus with Applications (3-3)**

#### **Prerequisites:**

For MAT 151: MAT 111 or 115 or the equivalent preparation in algebra.

For MAT 152: MAT 112 or 115 or equivalent preparation in algebra and trigonometry and 151.

#### **Purpose:**

This calculus sequence is intended for majors that emphasize techniques and applications rather than theory and derivations.

#### **Material Covered:**

MAT 151: Differentiation and integration of algebraic, exponential, and logarithmic functions.

MAT 152: Partial differentiation, sequences, series, and trigonometric functions.

#### **Who should take this course:**

This course is primarily designed for majors in business, biology, and the social sciences.

*(If your major is Mathematics, Engineering, Statistics, Physics, Chemistry, Biochemistry, or Computer Science and you have elected to take this course before taking MAT 161 to get a basic intro to calculus, keep in mind that you will still be required to take MAT 161, and taking this course will put you a full semester behind schedule in your mathematics sequence.)*

**Goal of the Course:** MAT 151 is the first half of the standard two-semester university basic calculus sequence. The intended audience are students majoring in biological sciences, business, and social sciences. Its principal goal is to show how calculus has served as the primary quantitative language of applications arising from these fields. It provides the basic theoretical ideas used to model change. Students in this course develop the mathematical skills found in the core topics of limits, differentiation, and integration. Students investigate the wider application of these skills in the natural and social sciences and communicate the results of investigations. MAT 151 will count for the Mathematics and Statistics requirement in University Studies by supporting all the Common Student Learning Outcomes (MS) for that category. If another course is used to meet the Mathematics

and Statistics requirement of University Studies, MAT 151 may count for the Quantitative and Logical Reasoning requirement by supporting all the Common Student Learning Outcomes (QRE) for Quantitative and Logical Reasoning.

**Course Student Learning Objectives:** Upon completing MAT 151, students should be able to:

- Use graphical, numerical, analytical and verbal representations of functions, limits, derivatives and integrals. (MS 1; QRE 1)
- understand the meaning of the derivative in terms of a rate of change and use derivatives to solve a variety of problems. (MS 1 & 2; QRE 1 & 2)
- understand the meaning of the definite integral both as a limit of Riemann sums and as the net accumulation of change and use integrals to solve a variety of problems. (MS 1 & 2; QRE 1 & 2)
- understand the relationship between the derivative and the definite integral as expressed in the Fundamental Theorem of Calculus. (MS 1; QRE 1)
- use correct mathematical syntax to explain solutions in both written and graphic forms. (MS 3; QRE 3)
- model a variety of applications using the concepts of calculus. (MS 2 & 3; QRE 2 & 3)
- use technology to help solve problems, interpret results, and verify and communicate conclusions. (QRE 1 & 2)
- determine the reasonableness of solutions, including sign, size, relative accuracy, and units of measurement. (MS 2 & 3; QRE 1, 2 & 3)

**State Policy on Excused Absences for Religious Observance:** In accordance with North Carolina G.S. 116-11(3a), students are entitled to two excused absences per academic year for religious observances. In order to preserve your right to make up any tests or other work missed for religious observance required by your faith, you must inform the Registrar in writing of your intended absence before the end of the first week of class.

### **MyLab & Mastering Student Registration Instructions**

To register for MAT 151 006 Basic Calculus I, Fall 2014:

1. Go to [pearsonmylabandmastering.com](http://pearsonmylabandmastering.com).
2. Under Register, click Student. 3. Enter your instructor's course ID: gurganus64816, and click Continue.
4. Sign in with an existing Pearson account or create an account:
  - If you have used a Pearson website (for example, MyITLab, Mastering, MyMathLab, or MyPsychLab), enter your Pearson username and password. Click Sign in.
  - If you do not have a Pearson account, click Create. Write down your new Pearson username and password to help you remember them.
5. Select an option to access your instructor's online course:
  - Use the access code that came with your textbook or that you purchased separately from the bookstore.
  - Buy access using a credit card or PayPal.
  - If available, get 14 days of temporary access. (Look for a link near the bottom of the page.)
6. Click Go To Your Course on the Confirmation page. Under MyLab & Mastering New Design on the left, click MAT 151 006 Basic Calculus I, Fall 2014 to start your work.

Retaking or continuing a course?

If you are retaking this course or enrolling in another course with the same book, be sure to use your existing Pearson username and password. You will not need to pay again.

To sign in later:

1. Go to [pearsonmylabandmastering.com](http://pearsonmylabandmastering.com).
2. Click Sign in.
3. Enter your Pearson account username and password. Click Sign in.
4. Under MyLab & Mastering New Design on the left, click MAT 151 006 Basic Calculus I, Fall 2014 to start your work.

Additional Information

See Students > Get Started on the website for detailed instructions on registering with an access code, credit card, PayPal, or temporary access.

### **Recommended problems in the text:**

#### **Chapter 1: Linear Functions** (quick review)

- 1.1 Slopes and Equations of Lines  
# 15, 19, 49, 61, 63, 65 a, b, c, e, 69, 71, 75  
(Do especially some whose subject matter interests you.)  
*(64 and 72 are also good; you can check even answers in my book.)*
- 1.2 Linear Functions and Applications  
# 15 – 18, 19, 27, 29, 33, 35, 37, 41, 46

#### **Chapter 2: Nonlinear Functions** (quick review)

- 2.1 Properties of Functions  
# 19 – 27 odd, 33, 71a, 73, 75, 79
- 2.2 Quadratic Functions  
# 13-21 odd, 49, 53, 55, 57, 61, 68-69
- 2.3 Polynomial and Rational Functions  
Polynomials # 1, 3, 5, 21, 23, 25, 43  
Rationals # 27 – 41 odd  
Cost-Benefit Analysis: example 7 on p. 72 and # 51
- 2.4 Exponential Functions  
# 3, 4, 13 – 21 odd, 37 – 43 odd, 47, 49
- 2.5 Logarithmic Functions  
# 1 – 17 odd, 21, 23, 27, 37, 39, 41 – 53 odd, 75, 77, 87
- 2.6 Applications: Growth and Decay; Mathematics of Finance  
11, 13, 19, 21 a-b, 27, 2933, 35, 37

#### **Chapter 3: The Derivative**

- 3.1 Limits  
1 – 51 odd, 61, 64, 87, 92
- 3.2 Continuity

1 – 13 odd, 19 – 27 odd, 35, 37

3.3 Rates of Change

1, 3, 5, 9 – 17 odd, 23, 24, 25, 27, 31, 35

3.4 Definition of the Derivative

1 – 25 odd, 35, 37, 39, 49, 51, 53

3.5 Graphical Differentiation

(will be covered briefly in class, no problems assigned)

**Chapter 4: Calculating the Derivative**

4.1 Techniques for Finding Derivatives

Derivative of Constant, Power, Constant times Function  
and Sum or Difference of Functions

1 – 17 odd, 23, 31, 33, 37, 47, 51, 53, 55, 59, 69, 73

4.2 Derivatives of Products and Quotients

1 – 27 odd, 31, 33, 39

4.3 Derivatives of Composite Functions: Chain Rule

21 – 39 odd, 45, 47, 49

4.4 Derivatives of Exponential Functions

1 – 33 odd, 38, 41, 44, 45, 47, 55

4.5 Derivatives of Logarithmic Functions

1 – 21 odd, 25 – 27 odd, 65

**Chapter 5: Graphs and the Derivative**

5.1 Increasing and Decreasing Functions

1 – 7 odd, 13 – 35 odd, 47, 55

5.2 Relative Extrema (local max and min pts)

1 – 7 odd, 13 – 35 odd, 41, 45 – 49 odd

5.3 Higher Derivatives, Concavity, 2<sup>nd</sup> Derivative

27, 33, 37, 39, 73, 81, 86

5.4 Curve Sketching

3, 5, 7, 9, 11, 15, 17, 23

**Chapter 6: Applications of the Derivative**

6.1 Absolute Extrema

1 – 7 odd, 9, 10, 11, 15

6.2 Applications of Extrema

9, 11, 13, 19, 21, 23, 33, 37, 47

6.3 OMIT

6.4 Implicit Differentiation

1 – 21 odd

6.5 Related Rates

1, 5, 9, 11, 15, 17, 19, 21, 273

6.6 OMIT

**Chapter 7: Integration**

7.1 Antiderivatives

- 1 – 43 odd, 63
- 7.2 Substitution
  - 1 – 35 odd
- 7.3 Area and the Definite Integral
  - 5d, 7d, 11d, 13
- 7.4 Fundamental Theorem of Calculus
  - 1-27 odd, 31-43 odd
- 7.5 Area Between 2 Curves
  - 1 – 11 odd, 17