

## **Math 131 Syllabus Summer 2022**

**Text: Applied Calculus: A Brief Approach by Soo Tan**

**Homework Management System: WebAssign**

**Calculator: TI-83 or TI-84**

**This course satisfies the Mathematical and Quantitative Reasoning (MQR) requirement of the Pathways General Education Required Core. Below is the Learning Outcomes that all MQR courses satisfy:**

MQR 1: Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.
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MQR 2: Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.
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MQR 3: Represent quantitative problems expressed in natural language in a suitable mathematical format.
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MQR 4: Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.
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MQR 5: Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.
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MQR 6: Apply mathematical methods to problems in other fields of study.
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Math 131 is a one-semester calculus course designed primarily for students concentrating in economics, social science, and accounting. Throughout this course examples from economics and social science should be emphasized. Rigorous proofs are not required; students should gain an intuitive understanding of the basic concepts of calculus, especially linearity, tangent lines, and linear approximation, and how to apply these ideas.

This semester Math 131 is adopting a new textbook. The chapter sections given below are from the 10<sup>th</sup> Edition. The suggested number of classes represent 75 minute units, 2 classes/week for 14 weeks = 28 classes, 4 classes are reserved for tests & review. The calculus committee recommends 3 in-class exams equally spaced in the semester. This semester Math 131 is also adopting the homework management system, WebAssign. Use of the HMS remains optional for instructors. See notes below.

Chapter 2: Functions, Limits, and Derivatives 6 classes

- 2.1 Functions and their Graphs
- 2.2 Algebra of Functions
- 2.3 Functions and Mathematical Models
- 2.4 Limits
- 2.5 One-Sided Limits and Continuity
- 2.6 The Derivative

Chapter 3 Differentiation 7 classes

- 3.1 Basic Differentiation Rules
- 3.2 The product & quotient rules
- 3.3 The chain rule
- 3.4 Marginal Functions in Economics
- 3.5 Higher-Order Derivatives
- 3.6 Implicit Differentiation and Related Rates
- Optional Topic if Time Permits:
- 8.2 Partial Derivatives (pages 566 to 573)

Chapter 4 Applications of the Derivative 7 classes

- 4.1 Applications of the First Derivative
- 4.2 Applications of the Second Derivative
- 4.3 Curve Sketching
- 4.4 Optimization I
- 4.5 Optimization II

Chapter 5 Exponential and Logarithmic Functions 4 classes

- 5.1 Exponential Functions
- 5.2 Logarithmic Functions
- 5.3 Compound Interest
- 5.4 Differentiation of Exponential Functions
- 5.5 Differentiation of Logarithmic Functions

## Textbook

The physical bookstore at Queens College has closed and been replaced with an on-line service here: <http://qc.textbookx.com/institutional/index.php> This site sells textbooks without the WebAssign HMS.

The publisher of our textbook (Cengage) offers sales direct to students here <https://www.cengage.com/c/applied-calculus-for-the-managerial-life-and-social-sciences-a-brief-approach-10e-tan/9781285464640PF/> (reportedly more affordable.)

## HMS Guidelines

Website: <http://webassign.net/> Instructors can get logins here: <http://webassign.net/>

In addition to online homework, the web site offers an e-book version of our text, a personal study guide for students, and videos of lectures linked to each section of the book. All students self-enroll in WebAssign.

If you are using WebAssign for on-line homework you will need to create a Course in your account for your section. Once you create this section the system will give you a class key, which your students will use to enroll in your section. Later you can find this code in Class View by clicking on “class key settings” in the Class Tools menu.

To create your section: Choose “Create” in the top left menu below “Home”, then “Course”, and select the textbook. Click “enable personal study plan” and the textbook certification. Once you set the start date of the course, students have a 2-week grace period after that date during which they can log in without having paid for access. After you save the course settings, set “How will students be placed on your roster” to self-enrollment.

## TI-84+ Guidelines for Math 131

On departmental finals students are not permitted to use calculators which do symbolic differentiation and integration (for example, the TI-89 or TI-92). All sections of Math 131 should cover the following basic calculator operations

Graphing:

Y= menu, WINDOW, TRACE, GRAPH

ZOOM: zoom in, zoom out, zoom box, zoom standard

Use of the FORMAT and MODE menus

TABLE Menu: TBLSET, Using TABLE to find limits numerically

Obtaining more digits than table display allows

Since the treatment of limits in Math 131 is very compressed, the table function can be very useful to help students develop the correct intuition.

CALC menu: VALUE, ZERO, MIN, MAX

VARS menu: using Y-VARS to patch in functions from y= menu

Finding roots numerically:

1. Using CALC → ZERO within graph window
2. Using TRACE and ZOOM with graph