Paul D. Camp Community College
Department of Mathematics
Fall 2018 Course Syllabus

Course Title: Applied Calculus I

Course Number: MTH 261-113

Credit Hours: 3

Course Prerequisites: Completion of MTH 161 or equivalent with a grade of C or better.

Instructor: Col. Joel Bradshaw

- **Office Location:** Southampton High School, Math Teacher Office, Room 706
- **Office Hours:** Wednesdays after school by appointment at least 24 hrs in advance
  Tuesday mornings during Student Success
  All other times by appointment only
- **Telephone Number:** 703-209-3030 (send texts to 757-304-2311)
- **E-mail address:** jbradshaw@pdc.edu

Course Description: Introduces limits, continuity, differentiation and integration of algebraic, exponential and logarithmic functions, and techniques of integration with an emphasis on applications in business, social sciences and life sciences.

Course Overview: The general purpose of this course is to prepare students in business, social sciences and life sciences to apply concepts of differentiation and integration of algebraic, exponential and logarithmic functions in future mathematics and degree coursework. *This course will also help STEM students excel in Calculus when attending a four-year university.*

Course Objectives: Upon completion of MTH 261, you should be able to:

• Limits and Continuity
  o Calculate and interpret limits at particular x-values and as x approaches infinity.
  o Determine whether a function is continuous at a given point and over open/closed intervals.
• Derivatives
  o Find the derivative of a function applying the limit definition of the derivative.
  o Interpret the derivative as both the instantaneous rate of change of a function and the slope of the tangent line to the graph of a function.
  o Use the Power, Product, Quotient, and Chain rules to find the derivatives of algebraic, exponential, and logarithmic functions
• Applications of the Derivative
  o Find the relative extreme values for a continuous function using the First and Second Derivative Tests.
  o Apply derivatives to solve problems in life sciences, social sciences, and business.
  o Find higher order derivatives and interpret their meaning. o Use derivatives to model position, velocity, and acceleration.
  o Apply First and Second Derivative Tests to determine relative extrema, intervals of increase and decrease, points of inflection, and intervals of concavity.
  o Graph functions, without the use of a calculator, using limits, derivatives and asymptotes.
  o Use derivatives to find absolute extrema and to solve optimization problems in life sciences, social sciences, and business.
  o Perform implicit differentiation and apply the concept to related rate problems.
  o Evaluate partial derivatives and interpret their meaning.

• Integration and Its Applications

o Use basic integration formulas to find indefinite integrals of algebraic, exponential, and logarithmic functions.

o Develop the concept of definite integral using Riemann Sums.

o Evaluate definite integrals using Fundamental Theorem of Calculus.

Topical Outline

- Chapter R – Functions, Graphs, and Models
- Chapter 1 – Differentiation
- Chapter 2 – Applications of Differentiation
- Chapter 3 – Exponential and Logarithmic Functions
- Chapter 4 – Integration

Learning Experiences: The instructor will:

1. Explain mathematical concepts in a college lecture format.
2. Show how course content is used in the workplace, other classes, etc., including personal experiences from engineering in the military and uses in businesses.
3. Discuss other informational details that the instructor feels are relevant to this course

Methods of Instruction: This course is taught in a hybrid manner. Classes are face-to-face lecture. Most Homework and Quizzes (for grade) will be online, using MyMathLab.

This course is fast paced.

Come to class prepared! This is necessary for a good grade.

Methods of Evaluation: Tests, Quizzes, Homework, Class Participation, Projects

Textbook(s) and Required Materials

A. **Textbook**: *Calculus and Its Applications*, 11/e, by Bittinger, et al. ©2016 • Pearson (ISBN-10: 0-321-97939-7, ISBN-13: 978-0-321-97939-1). Provided by school.

B. Scientific Calculator: TI -30X IIs (provided in class) when allowed on Tests and Quizzes.

C. TI-84 Plus CE for instructional purposes in class. (Virginia Community College System is moving toward not allowing calculators.)

D. Spiral Notebook or 3-Ringer Binder, Loose Leaf Paper, Graph Paper, Ruler, Highlighters or Colored Pens/Pencils(optional, but suggested)

Course Policies

- **Attendance:**

You must attend all classes unless you have made other arrangements with your instructor. It is a requirement to contact your instructor if you plan to be absent. You are responsible for all material covered and assigned in class. Even if you are absent, you must keep up with all class work and assignments. Students with absences in excess of twenty percent (20%) of the scheduled instructional time will receive an "F" for the class.

- **Tardiness**

Tardiness is not accepted and you are expected to be in your seat when the bell rings. If you must be late, you must have a valid pass signed by a teacher or the school office.

- **Grading***

Tests	40%
Quizzes	30%
Project	10%
Homework	10%
Classwork	10%
TOTAL .85 x 100% =	85%
FINAL EXAM	15%
COURSE GRADE	100%

SHS/PDCCC Grade:
A: 90 – 100%
B: 80 - 89%
C: 70 - 79%
D: 60 - 69%
F: 59% and below

* The mandatory Final Exam will count 15% of the course grade.
** Your classwork, homework, quiz, and test scores will be entered into Power School at least weekly.

- **Tests:**

  There will be paper tests on each Unit and a final exam as noted on the Schedule (or as modified by the instructor in class). You are expected to take tests on time. If you are absent from a test (Emergency's Only, documentation must be dated for the day missed). You must write a note (email) to the instructor (in advance) to explain the reason for the absence and to make special arrangements to take a make-up test. . The test must be made up before you attend the next class, or a grade of ZERO will be given.
  I WILL NOT EMAIL YOU OR ASK YOU TO MAKE UP YOUR TEST.
  THIS IS YOUR RESPONSIBILITY, NOT MINE.

- **Quizzes for Grade:**

  There will be quizzes on one to three sections at least once a week. Most quizzes will be on MyMathLab, but some may be on paper in class.

- **Homework:**
  - Most homework will be done on MyMathLab.
  - Regular completion of homework assignments is most important for your success.
  - You should read the material in the textbook and work example problems before class.
  - You will be assigned homework (from the textbook and/or MyMathLab),
  - I strongly advise you to work on homework with classmates in study groups.
  - Homework is due the class after it is assigned or as set in MyMathLab.

- **Late or make-up work:** Instructor's discretion: You are allowed one late work pass. But the late work MUST be submitted within one class time of being late. After that one time, no late work is accepted. If you are absent, you are expect to turn in your work when you get back to class.

- **Tutoring/Help:** SMARTHINKING is an online, Internet based tutoring service offered to all students at the college. SMARTHINKING connects students to highly qualified and well trained tutors in a variety of subjects including Basic Math , Algebra, Geometry, Trigonometry, Calculus, a Writing Lab, General Chemistry, Physics, Accounting, Statistics, Economics, Finance, Biology, and Anatomy and Physiology. SMARTHINKING will provide you with the tutoring, writing services, and homework help that you need to succeed! You can find SMARTHINKING on your Blackboard homepage.

- **Academic Integrity:** **Cheating** and plagiarism will not be tolerated. First offense is a warning and the assignment will receive **a grade of ZERO**, second offense is **automatic failure** from the course. Homework should not be identical or look like anyone else's homework.

- **Student Responsibility Statement:** Students are responsible for being aware of the policies, procedures, and student responsibilities contained within the current edition of the Paul D. Camp Community College Catalog and Student Handbook. Students should be familiar with College policy regarding academic misconduct and inclement weather.

- **Student Disability Information/Statement (ADA Compliance Statement):** Students with documented disabilities may be eligible for accommodation in their classes. If you require such accommodations, contact either Mrs. Mrs. Gail Vaughan on the Franklin Campus at 569-6725 (Room 120D) or Ms. Hyler Scott on the Hobbs Campus at 925-6308 (Room 100G). Please provide your instructor with proper documentation from the Student Support Services before the end of the second week of classes so that appropriate adjustments can be arranged. All discussions are confidential.

- **Collegiate Level Expectation:** This class is taught as a collegiate level course using a college lecture format. Class expectations include: regular classroom attendance, regular class interactions, completion of all assignments by the deadline(s). An open communication between the instructor and student addressing questions/concerns, and abstract reasoning is emphasized.

  A regular method of communication between instructor and student occurs through blackboard, cell phone texts (757-304-2311) and PDC email; thus, students are expected to check daily. Students are responsible for all content, instructions, discussions, assignments, and communication by these methods. Discussion of student questions and concerns with the instructor is expected, anticipated, and strongly encouraged. This is recognized as a part of the learning process. Parental respect of interaction between the instructor and student (rather than between the parent and instructor) for all classroom purposes is expected and appreciated.

- **How to be Successful in This Course:** Do your homework, attend class, ask questions, and put in effort. Failure to do any of those four things may result in your not being successful in this course.
  - Do not ask me about extra credit, I do not believe in it.
  - Here is the key to this course…Do your homework and pay attention in class. If you need help, get it! Don't wait!
    - See me Wednesdays after school or during student success on Tuesday mornings,
    - Text me (757-304-2311), or email me at jbradshaw@pdc.edu.

- **Rule of Conduct**
  - Cell Phones may be used for taking pictures of work on board or when approved by the instructor for solving assigned problems or research.
  - No bullying, picking or teasing on other students.
  - Pick up after yourself, leave your desk as clean as it was when you came in.
  - Be respectful, courteous and kind to others in the class
  - Arrive to class on-time and be ready to start promptly
  - Respond and interact with the instructor via text, email, or face-to-face

- **Concerns:** If you have concerns about this course and the way it is working, please let your instructor or Dr. Oliver know. Dr. Oliver can be emailed: joliver@pdc.edu called: 757-925-6302 or his office is on the Suffolk Campus in the admissions suite.

MTH 261 FALL 2018 COURSE OUTLINE

Week of:	Topic
September 4	Introduction & Review Packet **Prerequisite Skills Diagnostic Test** (counts as classwork grade) R.1 Graphs & Equations R.2 Functions and Models R.3 Finding Domain and Range R.4 Slope and Linear Functions R.5 Nonlinear Functions and Models R.6 Mathematical Modeling and Curve Fitting **Quiz on Chapter R**
September 10	1.1 Limits: A Numerical and Graphical Approach 1.2 Algebraic Limits and Continuity 1.3 Average Rates of Change 1.4 Differentiation Using Limits of Difference Quotients *September 14 – Last Day to withdraw with Refund*
September 17	1.5 The Power and Sum-Difference Rules 1.6 The Product and Quotient Rules 1.7 The Chain Rule 1.8 Higher-Order Derivatives **Review and Test on Unit 1: Differentiation**
September 24	2.1 Use First Derivative Test & Sketch Graphs 2.2 Use Second Derivative Test & Sketch Graphs 2.3 Graph Sketching: Asymptotes and Rational Functions 2.4 Use Derivatives to find Absolute Maximum and Minimum Values 2.5 Max-Min Problems: Business, Economics, and General Applications
October 1	2.6 Marginals and Differentials 2.7 Elasticity of Demand 2.8 Implicit Differentiation and Related Rates **Review and Test on Unit 2: Applications of Differentiation**
October 8	3.1 Exponential Functions 3.2 Logarithmic Functions 3.3 Applications: Uninhibited and Limited Growth Models 3.4 Applications: Decay *October 12 – Last Day to Withdraw with grade of "W"*
October 15	3.5 Derivatives of a^x and $\log_a x$; Application on Annuities 3.6 Business Application on Amortization **Review and Test on Unit 3: Exponential & Logarithmic Functions**
October 22	4.1 Antidifferentiation 4.2 Antiderivatives as Areas **Submit Project on Differentiation Application**
October 29	Review for Final Exam
November 1	**FINAL EXAM**

**** This schedule is subject to change as announced in class. ****