

PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS
CALCULUS I
MATH 1910

Class Hours: 4.0
Laboratory Hours: 0.0

Credit Hours: 4.0
Date Revised: Fall 2011

Catalog Course Description:

Single variable calculus for students majoring in science, mathematics, engineering, and computer science. Limits and differentiation of polynomial, rational, trigonometric, exponential and logarithmic functions and applications.

Entry Level Standards:

A thorough knowledge of algebraic and trigonometric functions is necessary for entrance to this course. Students must be able to read at the college level.

Prerequisites:

High school algebra I and algebra II and geometry and trigonometry and an ACT math score of at least 26; or MATH 1730; or MATH 1710 and 1720.

Textbook(s) and Other Reference Materials Basic to the Course:

Calculus: Early Transcendentals by Jon Rogawski,, Second Edition, W.H. Freeman and Company, 2012. ISBN 978-1-4292-8256-7

References:

Calculus: Early Transcendentals by Anton, BIVens and Davis, Tenth Edition, Wiley, 2011. ISBN 978-0470647691

University Calculus, Early Transcendentals by Hass, Weir, and Thomas, First Edition, Addison Wesley, 2011. ISBN 978-0321759900

Calculus: Early Transcendentals by James Stewart, Seventh Edition, Brooks Cole, 2011. ISBN 978-0538498678

Technology Requirement.

The Texas Instruments TI-84 or TI-84 Plus graphing calculator is recommended. Symbolic calculators are not permitted.

I. Week/Unit/Topic Basis:

Week	Topic
1	Introduction, Precalculus Review, Limits, Rates of Change and Tangent Lines
2	Limits (Numerically and Graphically), Limit Laws, Limits and Continuity
3	Continuity, Evaluating Limits Algebraically, Trigonometric Limits
4	Intermediate Value Theorem, Formal Definition of a Limit, Derivative Definition,
5	The Derivative as a Function, Review, Exam 1
6	Product and Quotient Rules, Rates of Change, Higher Derivatives
7	Trigonometric Functions, Chain Rule
8	Implicit Differentiation, Related Rates
9	Derivatives of Inverse, Exponential, and Logarithmic Functions
10	Review, Exam 2, Linear Approximation
11	Extreme Value Theorem, Mean Value Theorem and Monotonicity
12	The Shape of a Graph, Graph Sketching and Asymptotes
13	Applied Optimization, L'Hopital's Rule
14	Newton's Method, Antiderivatives, Exam 3
15	Final Exam

II. Course Goals*:

The course will:

- A. Guide students to become familiar with all descriptive aspects of a function. VI. 1-6

- B. Develop the concept of a limit of a function. Enhance students' ability to find the limit of a function graphically, algebraically, and through using L'Hospital's Rule. VI. 1-6
- C. Build skills to calculate derivatives of algebraic and transcendental functions. VI. 1-6
- D. Pose real and technical problems mathematically. VI. 1-6
- E. Apply limits and derivatives to solve real and technical problems. VI. 1-6
- F. Guide students to interpret and communicate mathematical problems and their solutions into clearly written English. VI. 1-6

*Roman numerals after course goals reference the General Education Goals of the Mathematics program.

III. Expected Student Learning Outcomes*:

Student will be able to:

1. Determine what a function is and work comfortably with functional notation. A
2. Evaluate limits and derivatives of algebraic and transcendental functions using analytic, numerical and graphing techniques. Evaluate the derivative of a function using the (limit) definition. B, C
3. Graph a function using the concepts of symmetry, domain, shifting and stretching, along with information gathered from limits, the function's derivative and the aid of a graphing calculator and/or computer software. A, E
4. Recognize a continuous function. Classify the different types of discontinuities using analytical and graphical means. B
5. Apply derivatives to solve problems such as distance - velocity - acceleration, related rate and optimization problems. E
6. Read and interpret graphs, limits and derivatives which are used in applied settings and communicate that analysis in writing. F
7. Work with technology and special projects involving real world data which enhances the conceptual understanding and usefulness of mathematics. D, F

*letters after Expected Student Learning Outcomes reference the course goals listed above.

IV. Evaluation:

- A. Testing Procedures: 100% of grade or instructor discretion if lab work and/or section projects are utilized.

Students are evaluated primarily on the basis of chapter tests, quizzes, homework, and the comprehensive final exam. A minimum of 4 major tests and the comprehensive is recommended.

- B. Laboratory Expectations: 0% of grade or instructor discretion.
- C. Field Work: None
- D. Other Evaluation Methods: None

V. Policies:

- A. Attendance Policy:

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of the Learning Division, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of the Learning Division.

- B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as

one's own work.

- Taking an exam for another student.
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment.

C. Accommodations for Disabilities:

Students who need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins 127, 132, 134, 135, 131 or by phone: 539-7153 or TTY 694-6429. More information is available at www.pstcc.edu/departments/swd/.

D. Cell Phones:

Cell phones are to be either turned off or put on vibrate mode while in class. Instructor discretion as to penalty.