

**WALTERS STATE COMMUNITY COLLEGE
COURSE SYLLABUS**

COURSE NAME AND NUMBER: Calculus I - MATH 1910

SEMESTER AND YEAR:

INSTRUCTOR:

Mathematics Division Fax: 423-585-6873

Division Secretary: 423-585-6864

Tutoring: Mrs. Beth Dixon at Beth.Dixon@ws.edu or 423-585-6872 or MBSS 222

or Ms. Mary Breedlove at Mary.Breedlove@ws.edu or 423-585-6920 or CCEN 261

Office Hours: Posted on office door. Office hours are times the instructor is on campus.

If a student needs assistance, it is recommended that they make an appointment.

REQUIRED TEXTBOOK: Calculus Single and Multivariable 4th Edition Hughes-Hallett, Wiley

REQUIRED TECHNOLOGY: A TI-89, TI-89 Titanium, Voyage 200, TI-92 Plus, or TI-92 calculator is required. Ask about WSCC calculator loaner program for Calculus I.

CATALOG DESCRIPTION OF COURSE:

A standard first-semester course in single variable calculus and analytic geometry especially for students of science, engineering, mathematics, secondary mathematics education, and scientific computer science. Differential and integral calculus with applications. (Prerequisites: Two years of algebra, a year of geometry, and half a year of trigonometry in high school plus satisfactory placement scores, or MATH 1720.)

4 Semester Credits

COURSE OUTCOMES:

1. Evaluate limits of functions including one-sided limits, two-sided limits, limits involving infinity, and limits using l'Hopital's Rule.
2. Identify where a given function is continuous. Use the definition of continuity to show a function is continuous at a point.
3. Use the definition to find derivatives. Understand the conceptual meaning of derivative.
4. Differentiate power functions, exponential, logarithmic, trigonometric, and inverse trigonometric functions
5. Differentiate sums, products, and quotients of functions. Use chain rule to differentiate composite functions. Use implicit differentiation to find derivatives.
6. Use derivatives to identify where functions are increasing, decreasing, concave up, and concave down. Use derivatives to find local extrema, find points of inflection, and to graph functions.
7. Use derivatives to solve applied problems.
8. Find antiderivatives (indefinite integrals) of linear combinations of power functions, basic trigonometric functions, and exponential functions.
9. Approximate signed areas (definite integrals) using right-hand, left-hand, and midpoint rectangles.
10. Use Fundamental Theorem of Calculus to find and signed area and construct antiderivatives.
11. Use substitution techniques to find indefinite and definite integrals.

GENERAL EDUCATION DESIGNATION: Mathematics (4 hours)

COURSE CONTENT:

Chapter 1 – A Library of Functions Treat Chapter 1 sections 1-6 as review

- 1.1 Functions and Change
- 1.2 Exponential Functions
- 1.3 New Functions from Old
- 1.4 Logarithmic Functions
- 1.5 Trigonometric Functions
- 1.6 Powers, Polynomials, and Rational Functions
- 1.7 Introduction to Continuity
- 1.8 Limits

Chapter 2 – The Derivative

- 2.1 How Do We Measure Speed
- 2.2 The Derivative at a Point
- 2.3 The Derivative Function
- 2.4 Interpretation of the Derivative
- 2.5 The Second Derivative
- 2.6 Differentiability

Chapter 3 – Short-Cuts to Differentiation

- 3.1 Powers and Polynomials
- 3.2 The Exponential Functions
- 3.3 The Product and Quotient Rule
- 3.4 The Chain Rule
- 3.5 The Trigonometric Functions
- 3.6 The Chain Rule and Inverse Functions
- 3.7 Implicit Functions
- 3.9 Linear Approximation and the Derivative
- 3.10 Theorems About Differentiable Functions

Appendix C Using Newton's Method

Supplement Logarithmic Differentiation

Chapter 4 – Using the Derivative

- 4.1 Using First and Second Derivatives
- 4.3 Optimization
- 4.5 Optimization and Modeling
- 4.6 Rates and Related Rates
- 4.7 L'Hopital's Rule, Growth, and Dominance

Chapter 5 – Key Concept: The Definite Integral

- 5.1 How Do We Measure Distance Traveled
- 5.2 The Definite Integral
- 5.3 The Fundamental Theorem and Interpretations
- 5.4 Theorems About Definite Integrals

Chapter 6 –Constructing Antiderivatives

- 6.1 Antiderivatives Graphically and Numerically
- 6.2 Constructing Antiderivatives Analytically
- 6.4 Second Fundamental Theorem of Calculus

Chapter 7 – Integration

- 7.1 Integration by Substitution

INSTRUCTIONAL AND EVALUATION METHOD:

FINAL EXAM: The final examination for the following classes will be:

COURSE GROUND RULES:

All students attending Walters State Community College, regardless of the time and location of the class, must abide by the rules and regulations outlined in the current *Walters State Catalog/Student Handbook* and the current *Walters State Timetable of Classes*. A copy of the Catalog /Handbook and the Timetable of Classes may be obtained from the admissions office on the main campus or at any of our off-campus sites. You may also access the Catalog/Handbook on-line at the following web address: <http://www.ws.edu/catalog>

Students should attend the first day of class or contact the instructor prior to the first class. Failure to do this may result in being dropped from the class.

Plagiarism, cheating, and other forms of academic dishonesty are prohibited.

Students with disabilities must register with Student Support Services (CCEN), Room 262 (phone 423-585-6892) if they need any special facilities, services, or consideration.

Students in need of tutoring assistance are encouraged to contact the Office of Student Tutoring located in the College Center (CCEN), Room 261. The phone number is 423-585-6920.

Students receiving any type of financial aid or scholarship should contact the Financial Aid Office before making any changes to their schedule. Schedule changes without prior approval may result in loss of award for the current term and future terms.

Students who have not paid fees on time and/or are not correctly registered for this class and whose names do not appear on official class rolls generated by the Admissions and Records Office will not be allowed to remain in class or receive credit for this course.

Cellular phone use during classroom interaction is prohibited. Cellular phones must be turned to the non-audible mode until after class, at which time calls can be received or checked. (See *the Walters State Catalog/Handbook*)

For information related to the cancellation of classes due to inclement weather, please check the college's Web site at www.ws.edu or call the college's student information line, 1-800-225-4770, option 1; InfoConnect, (423) 581-1233, option 1045; the Sevier County Campus, (865) 774-5800, option 9; or the Greeneville/Greene County Center for Higher Education, (423) 798-7940, option 4. Also, please monitor local TV and radio stations for weather-related announcements. For additional information on this policy see the college catalog.

In the event of a pandemic or other college declared critical event that impacts the college's ability to proceed with academic course activities as planned, the college reserves the right to alter this course plan. In the event of a pandemic or other event, please refer to the college's home web page, www.ws.edu or call InfoConnect, (423) 581-1233 for further information.

Regular class attendance is a student's obligation. (See *the Walters State Catalog/Student Handbook*) If for some reason a student misses class, it is his or her responsibility to see the instructor regarding missed assignments and/or activities and to be prepared for the next class. Excessive absences may substantially lower the semester grade. The college requires the instructor to keep accurate records and to report when students are not attending class.

ALTERNATE TEACHING PLAN: Email instructor for additional information

DROP DEADLINE:

ACCESS FULL SYLLABUS: <https://elearn.ws.edu/>