

**WALTERS STATE COMMUNITY COLLEGE
COURSE SYLLABUS**

COURSE NAME AND NUMBER: Calculus A - MATH 1830

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

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

Office Hours posted on door

REQUIRED TEXTBOOK: Brief Calculus Concepts: An Applied Approach to the Mathematics of Change
4th Edition by LaTorre, Kenelly, Reed, Carpenter, Harris, and Biggers

REQUIRED TECHNOLOGY: TI-83 or TI-84 graphing calculator required for course – discuss with instructor if you own a different graphing calculator

CATALOG DESCRIPTION OF COURSE:

A one-semester course in the differential and integral calculus of algebraic, exponential, and logarithmic functions with applications. (Prerequisite: Math 1630 or 1710 or permission of the instructor.)

3 Semester Credits

COURSE OUTCOMES: The student should be able to:

1. Use a graphing calculator to investigate the behavior of functions.
2. Use a graphing calculator to develop appropriate mathematical models including linear, polynomial, exponential, logarithmic, and logistic regression.
3. Use mathematical models to solve problems and make predictions.
4. Develop an intuitive concept of limits.
5. Find and interpret average rates of change and slopes of secant lines.
6. Understand the concept of derivative as instantaneous rate of change and slope of a tangent line.
7. Use the definition of derivative to find derivatives.
8. Differentiate functions in the form of x^n , b^x , and $\ln(x)$.
9. Differentiate sum, difference, product, and composite functions.
10. Find, interpret, and use derivative models to solve problems.
11. Demonstrate an understanding of the relationship between the behavior of a function and its derivatives.
12. Solve optimization problems.
13. Approximate the area between two curves by summing the area of approximating rectangles.
14. Find the area between two curves using definite integrals.
15. Find and use antiderivatives of functions of the form x^n and b^x to solve problems.
16. Interpret the Fundamental Theorem of Calculus as a connection between integrals and derivatives.
17. Apply the Fundamental Theorem of Calculus to evaluate definite integrals.
18. Apply the concepts of calculus to investigate real-world situations including applications to business, social, and health models.

GENERAL EDUCATION DESIGNATION: Mathematics (3 hours)

COURSE CONTENT:

Chapter 1 - Ingredients of Change: Functions and Models

- 1.1 Models and Functions
- 1.2 Linear Functions and Models
- 1.3 Exponential and Logarithmic Functions and Models
- 1.4 Logistic Functions and Models
- 1.5 Polynomial Functions and Models

Chapter 2 – Describing Change: Rates

- 2.1 Change, Percentage Change, Average Rates of Change
- 2.2 Instantaneous Rates of Change
- 2.3 Derivative Notation and Numerical Estimates
- 2.4 Algebraically Finding Slopes

Chapter 3 - Determining Change: Derivatives

- 3.1 Drawing Rate-of-Change Graphs
- 3.2 Simple Rate-of-Change Formulas
- 3.3 Exponential and Logarithmic Rate-of-Change Formulas
- 3.4 The Chain Rule
- 3.5 The Product Rule

Chapter 4 - Analyzing Change: Applications of Derivatives

- 4.1 Approximating Change
- 4.2 Relative and Absolute Extreme Points
- 4.3 Inflection Points
- 4.4 Interconnected Change: Related Rates

Chapter 5 - Accumulating Change: Limits of Sums and the Definite Integral

- 5.1 Results of Change and Area Approximations
- 5.2 Accumulation Functions
- 5.3 The Fundamental Theorem
- 5.4 The Definite Integral

INSTRUCTIONAL AND EVALUATION METHOD:

FINAL EXAM:

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*). **Students are expected to show the courtesy of refraining from text-messaging during class. The instructor may collect for the duration of class any cell phones used to text during class or request that the student leave the class.**

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: Go to <https://elearn.ws.edu> for links to class content.

DROP DEADLINE:

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

WEB RESOURCES: <http://www.ws.edu> , then click online icon for ELEARN and STARNET.