

POLK STATE COLLEGE

MAC 2311, CALCULUS I

LAKELAND DEAN'S OFFICE: LLC 2255 PHONE: (863) 297-1024

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CREDIT HOURS, PREREQUISITES, AND COURSE DESCRIPTION:

5 hours Lecture, 5 credits

Prerequisites: MAC 1140 and MAC 1114, or MAC 1147, or appropriate placement examination score

This course provides a study of limits; differentiation and integration of algebraic, trigonometric, logarithmic, and exponential functions; and applications involving the analysis of graphs, optimization, approximation, and rates of change. Students who enroll should have a strong background in algebra, plane geometry, and trigonometry. This course is essential to students majoring in mathematics, science, or engineering programs. Success in this course depends on a strong foundation in algebra and a willingness to devote ample time to studying and working problems. A graphing calculator (TI-83 or equivalent) is required.

PSC MISSION AND CORE OBJECTIVES: Polk State College is a quality-driven educational institution, providing access to affordable associate and baccalaureate degrees, career certificates, and workforce development programs, delivered by diverse, qualified faculty and staff who are committed to student learning and achievement through the consistent practice of collaboration and focus on excellence. In line with this purpose, PSC's general education develops competence in the areas of 1) Communication, 2) Critical Thinking, 3) Scientific and Quantitative Reasoning, 4) Information Literacy, 5) Diversity, 6) Culture, 7) Ethics and 8) Social Responsibility. Please see the PSC catalog for complete descriptions of these outcomes. A primary focus of this course is competence related to the areas of:

2. Critical Thinking

Demonstrate the ability to reflect on, analyze, synthesize, and apply information through problem solving.

3. Scientific and Quantitative Reasoning

Understand and apply mathematical and scientific principles and methods to solve abstract and real-world problems.

COURSE OBJECTIVES:

1. Analyze the limits of functions. (2)
2. Determine the derivatives of polynomial, rational, radical and trigonometric functions. (3)
3. Identify extrema of a function using first and/or second derivative tests. (2,3)
4. Identify concavity and inflection points of a function using the second derivative. (2,3)
5. Integrate functions using basic integration rules and/or substitution. (3)
6. Evaluate the definite integral. (3)
7. Interpret the 1st and 2nd derivatives to sketch the graph of their function. (2,3)
8. Use extrema, concavity and asymptotes to sketch the graph of a function. (2,3)
9. Use calculus to solve real world problems involving related rates. (2,3)

10. Use calculus to solve real world problems involving position, velocity, and acceleration functions. (2,3)
11. Use calculus to determine minimum and maximum values in real world optimization problems. (2,3)
12. Use differentials to estimate propagated error. (2,3)
13. Compute the derivatives and integrals of logarithmic, exponential, and trigonometric functions. (2)

TEXTBOOK AND OTHER REQUIREMENTS: For textbook information, visit the campus bookstore, the bookstore website at www.efollet.com, or see the course syllabus.

COURSE CONTENT:

- Chapter 1 Limits and Their Properties
 - Chapter 2 Differentiation
 - Chapter 3 Applications of Differentiation
 - Chapter 4 Integration
 - Chapter 5 Logarithmic, Exponential, and Other Transcendental Functions (5.1 – 5.5)
- Additional topics as determined by the instructor

METHODS OF INSTRUCTION: These will vary according to specific course objectives, student learning needs, and instructional style.

THE GORDON RULE: The Gordon Rule, State Rule 6A-10.30, requires A.A. program students to complete six semester hours of English and six semester hours of additional courses in which the student must demonstrate college-level writing skills through multiple assignments. Because PSC uses a "Writing Across the Curriculum" approach to meeting the writing requirement, in addition to the required composition courses, any of the required social sciences and humanities courses will fulfill the writing requirement. This is not a Gordon rule writing course, but it may include writing assignments as part of course requirements.

In addition, State Rule 6A-10.30 requires A.A. program students complete six credits of college level mathematics. Taking the appropriate general education mathematics courses satisfies the mathematics portion of the requirement.

A minimum grade of "C" is required in all courses with primary responsibility for fulfilling the communications and mathematics areas of the general education requirements. This includes any course taken to complete the general education mathematics requirement, and the courses taken to complete the communications requirement.

STUDENT HELP: The instructor is available for help during posted hours and by appointment during other non-class hours. Students are encouraged to seek assistance from the instructor. To further the educational process, the Teaching /Learning /Computing /Center (TLCC) provides qualified staff and up-to-date equipment and facilities to promote student academic success by providing tutoring services, computing resources, and other instructional support. TLCC hours of operation and tutor schedules are posted in the TLCCs and available on PSC's website at: www.polk.edu/it/tlcc.

WITHDRAWAL: Students may officially withdraw from course(s) during any given term provided the appropriate policy and procedure is followed. Following the conclusion of the Drop/Add period, the student may officially withdraw without penalty from any credit course provided the appropriate forms are submitted to Student Services no later than the deadline published in the

term schedule booklet. (The published deadline reflects the 70% point in the course based upon the course's scheduled duration.) It is the student's responsibility to submit these withdrawal forms. Failure to do so may result in an "F" in the course. By State rule students are not allowed to withdraw from the third course attempt. If students stop attending class after the deadline, or any time during the third attempt, a grade other than a "W" is assigned and posted. Students cannot use course withdrawal to avoid academic dishonesty penalties. Students who have been penalized for academic dishonesty in a course are not eligible to withdraw from the course.

REPEATING A COURSE: Under the Forgiveness Policy, a student is allowed three attempts in any one college credit course: one initial enrollment and two repeats. A course cannot be repeated unless the previously earned grade is a "D", "F", or "W" (see college catalog for details). Students are not allowed to withdraw from their third course attempt. If students stop attending class, a grade other than a "W" is assigned and posted.

ACADEMIC INTEGRITY: Students are responsible for their own work. It is assumed that each student is honest and will abide by that standard. However, in the event there is an indication or suspicion that there has been a case of cheating/plagiarism, the situation will be dealt with in accordance with published College policy. Copies of this policy are available in Student Services offices.

INFORMATION TECHNOLOGY ACCESS/USE POLICY: All individuals who employ information technology resources provided by Polk State College (this includes, but is not limited to telephones, computers, the PSC local area and wide area networks, and the Internet) must use these resources for academic purposes only. Use of these resources is a privilege, not a right. Inappropriate use can result in revocation or suspension of this privilege.

EQUAL OPPORTUNITY FOR STUDENTS WITH DISABILITIES: If you are a student with a disability and will need special accommodations or auxiliary aids under the Americans with Disabilities Act (ADA), please contact the Coordinator of Academic Advising in Student Services on the Lakeland Campus (863) 297-1000 Ext. 6110 or the Winter Haven Campus (863) 297-1000 Ext. 5227.

EVALUATIVE CRITERIA: The grade for the course will be based on grades earned on progress tests, a comprehensive final examination and additional work as determined by the instructor. The additional work, optional with the instructor, may consist of a combination of homework, quizzes, computer assignments, projects, in-class work or similar activities. The additional work, when chosen, will be combined into one grade and count as one progress test. Each progress test will count 100 points. There is no "drop grade" for this course. The procedure for making up missed tests will be determined by the instructor. The course average at any time prior to the final examination can be determined by finding the average of the progress tests at that time. The final examination will count as 25% of the final course average with the final course average calculated by the formula:

$$\frac{3 (\text{progress test average}) + \text{final exam percentage grade}}{4}$$

The course grade will be determined by using the following scale:

A = 90-100% B = 80-89% C = 70-79% D = 60-69% F = 0-59%

CALCULATOR POLICY: A graphing calculator (TI-83 or equivalent) is required for this course. The calculator will be used for work both in class and out of class. Calculators will generally be used on tests, but their use may be prohibited for particular tests or portions of tests as determined by the instructor. Calculators which have the capability of evaluating derivatives and/or integrals symbolically may be excluded from use on tests in calculus courses.

ATTENDANCE: Regular attendance is the student's responsibility. If a student has excessive absences (more than 5 hours), he/she may be dropped from the course with a "W" grade before the withdrawal date. After the withdrawal date, a student may receive an "F" grade for the course for excessive absences (more than 5 hours accumulated since the beginning of the term).

WORK MISSED: Procedures for work missed are determined by the instructor.