

MAC 2233 Calculus for Business and Social Science

Purpose of the Course

The purpose of MAC 2233 is to teach analysis of function behavior and related applications. The course may also be used to prepare students for economic modeling and for upper division courses in Quantitative Methods/Tools. The concepts learned in this course are also valuable for students taking the GRE economic exam.

Student Population

The audience for MAC 2233 is primarily students in business and social sciences, although students in other fields (such as pharmacy and architecture) also can benefit. The course also serves as preparation for graduate entrance exams, such as the GRE and the MCAT.

Sequence

MAC 2233 is not part of a sequence, although a more rigorous college algebra course is necessary for success in the course. It is also recommended that there be no time gap between the two courses; MAC 2233 should immediately follow MAC 1105.

Redefinition of Course

MAC 2233 is a calculus course that focuses on applications. The name of the course should be changed to Applied Calculus, so that the name better reflects the purpose of the course.

In order to better serve the students, instructors of this course must use appropriate technology to prepare students for the workplace. For instance, spreadsheet programs such as EXCEL may be a better choice than calculator.

General Topics

1. Limits
2. Differential calculus involving algebraic, logarithmic and exponential functions
3. Real-world applications of differential calculus
4. Integral calculus
5. Real-world applications of integral calculus

Specific Course Competencies

1. Create a model from a set of real-world data using an appropriate technology tool **and interpret results from the model created**
2. Explain the intuitive concept of limit
3. Evaluate limits in multiple formats
numerically (quantitatively)
algebraically (analytically)
graphically (visually)
4. Explain the intuitive concept of continuity
5. Determine point(s) of discontinuity
numerically
algebraically
graphically
6. Determine average and instantaneous rates of change
7. Interpret rates of change as either growth (increase) or loss (decrease).
8. Find a derivative using the limit definition.
9. Find derivatives of algebraic, exponential and logarithmic functions using appropriate rules.
10. Demonstrate an understanding of the meaning of derivatives by solving application problems such as finding the slope of a curve or determining the rate at which a function changes.
11. Differentiate implicitly.
12. Use derivative to solve business applications including marginal analysis and elasticity of demand.
13. Analyze function behavior using 1st and 2nd derivative tests.
14. Sketch graphs of functions using information derived from the derivative tests.
15. Solve optimization problems using derivatives.
16. Integrate indefinite integrals without using tables.
17. Evaluate definite integrals using the Fundamental Theorem of Calculus.
18. Use definite integrals to determine the areas under and between curves.
19. Use integration to solve application problems.