

BROOME COMMUNITY COLLEGE
Binghamton, New York

COURSE TITLE APPLIED CALCULUS I MAT 160

CLASS LECTURE HOURS 4 LAB HOURS 0 CREDIT HOURS 4

DIVISION DEAN Julia Peacock

DEPT. CHAIRPERSON Mary Woestman DATE March 2002

PREREQUISITE: MAT 130 Applied Algebra and Trigonometry or equivalent.

Learning objectives of Course:

The student should be able to:

MAT160 – Applied Calculus

1. Write the equation of a tangent line.
2. Evaluate limits algebraically.
3. Use limits to find vertical and horizontal asymptotes.
4. Find the points of discontinuity of a function.
5. Differentiate logarithmic, exponential, trigonometric and inverse trigonometric functions.
6. Use the chain rule, product and quotient rules in differentiating.
7. Differentiate implicitly.
8. Solve related rate problems.
9. Use differentials to find approximate values.
10. Antidifferentiate logarithmic, exponential, trigonometric and inverse trigonometric functions.
11. Use calculus methods to find area, center of gravity, volume of revolution, work done.
12. Use calculus methods to find maximum and minimum points of functions.
13. Use calculus methods to solve simple circuit and kinematic problems.
14. Approximate integrals using numeric methods.

Calculator objectives:

1. Graphing functions derived from applications to reinforce Calculus solutions.
2. Find limits graphically.
3. Find the slope of a tangent line to a curve at a specified point.
4. Graph a function and the tangent line at a specified point on the function.
5. Explain why the graphing calculator really does not draw a vertical asymptote for functions.
6. Graph a function and its derivative on the same axes.
7. Find relative extrema and inflection points of a function.
8. Evaluate definite integrals.
9. Show and determine the area under a curve.

CATALOG COURSE DESCRIPTION:

Designed for students in the Engineering Technologies only, this course covers the mechanics of calculus using application problems from technology fields. Topics include: equations of tangent lines; limits; differentiation and integration of algebraic, logarithmic, exponential, and trigonometric functions; product rule, quotient rule, and chain rule; implicit differentiation; related rates; maxima and minima; differentials; the definite integral and applications to finding area, center of gravity, volume of revolution and work done; numerical integration.

4 Class Hours; Prerequisite: MAT 130 Applied Algebra and Trigonometry

MAT 160

Applied Calculus

Course outline

Note: Order of topics subject to change

1. Limits
2. Continuity
3. Differentiation of logarithmic, exponential, trigonometric and inverse trigonometric functions.
4. Chain rule, product rule, and quotient rule for differentiation.
5. Implicit differentiation and related rates.
6. Differentials and approximations.
7. Anti-differentiation of logarithmic, exponential, trigonometric and inverse trigonometric functions.
8. Applications of calculus to graphing, area, volume, optimization, circuits, kinematics.
9. Numerical methods of approximation.