

MAT 113 – APPLIED CALCULUS

4 hrs./wk. – 4 cr.

9/4/2019

BEGINNING FALL 2019

Catalog Description: A study of topics which provides a basis for continuing courses in mathematics and the physical sciences. This course includes trigonometric, exponential and logarithmic functions; analytic geometry; differentiation and integration

Prerequisite: MAT 110 or MAT 123 or equivalent

Text: Washington, Evans, *Basic Technical Mathematics with Calculus, 11th ed.* (Pearson).

Syllabus

Period	Sections	Topics
1	2.1 – 2.5 (Review)	Geometry-Lines, Angles, Triangles, Quadrilaterals, Circles, Irregular Shapes
2 – 4	4.1 – 4.5	Angles, Trigonometric Functions, Function Values, Right Triangles
5 – 7	8. 1 – 8.4	Signs Of Trigonometric Functions, Trigonometric Functions Of Any Angle, Radians, Applications Of Radians
8	9.5 – 9.6	Oblique Triangles, Laws Of Sines And Cosines
9		Test #1 – Chapters 2, 4, 8, 9
10 – 11	10.1 – 10.4	Graphs Of Trigonometric Functions
12	20.1	Fundamental Trigonometric Identities
13 – 14	20.2 – 20.4	Sum, Difference, Double-Angle And Half-Angle Formulas
15 – 16	20.5 – 20.6	Trigonometric Equations, Inverse Trigonometric Functions
17 – 18	21.1 – 21.3	Introduction To Analytic Geometry; Lines, Circles
19		Midterm – Chapters 2, 4, 8, 9, 10, 20, 21
20 – 27	23.1 – 23.8	Limits, Slopes; Derivatives, Implicit Functions
28	24.1 – 24.2	Tangents, Normal, Newton's Method -Root Solving
29	24.4 – 24.5	Related Rates, Curve Sketching
30 – 31	25.1 – 25.2	Differentials, Antiderivatives, Indefinite Integrals
32	25.3 – 25.4	Areas, Definite Integrals
33	25.5 – 25.6	Trapezoidal Rule, Simpson's Rule
34		Test #2 – Chapters 23, 24, 25
35 – 37	2.6, 26.2 – 26.3	Review of Areas, Areas And Volume By Integration
38 – 39	27.1 – 27.3	Derivatives Of The Trigonometric Functions
40 – 41	13.1 – 13.7	Exponential And Logarithmic Functions
42	27.5 – 27.6	Derivatives of Exponential And Logarithmic Functions
43		Review, (Optional – Technology Excel Project)
44		Final Examination – Chapters 13, 23, 24, 25, 26, 27

Students are expected to adhere to the policies of the County College of Morris. These can be accessed at www.ccm.edu/academics/academic-policies/.

Statement of Course LEARNING OUTCOMES

- **Define, interpret** and **use** trigonometric, exponential and logarithmic functions
- **Identify, apply** and **solve** lines, angles, triangles, quadrilaterals, circles and irregular shapes
- **Recognize, solve** and **apply** trigonometric identities and equations
- **Identify** analytically and **describe** lines and circles
- **Define, interpret** and **calculate** limits and derivatives, and **apply** both the concepts to find slopes of tangent lines and **solve** rate problems
- **Define, interpret** and **calculate** integrals using various techniques including numerical integration, and **apply** these operations to solve geometrical and physical problems