

Course Title and Code	MATH115 - Integral Calculus
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I. **Course Identification and General Information:**

Course Title	Integral Calculus	Course Code	MATH115	Pre-requisite	MATH105
Department	Computer Engineering	Course Level	3	Credit Hours	3 (3+0)

II. **Course Description/Topics:** The following course topics will be covered.

- The indefinite integral.
- The definite integral.
- Fundamental theorem of calculus.
- Area, volume of revolution.
- Work, Arc length.
- Differentiation and integration of inverse trigonometric functions, the logarithmic, exponential, hyperbolic and inverse hyperbolic functions.
- Techniques of integration: substitution, by parts, trigonometric substitutions, partial fractions, miscellaneous substitutions.
- Numerical integration.
- Improper integrals.
- Polar coordinates.

III. **Course Outcomes:** Summary of the main learning outcomes for students enrolled in the course.

- Explain indefinite and definite integration
- Evaluate integrals using Techniques of Integration such as substitution, Trigonometry substitution, Inverse substitution, Partial fraction, Integral by parts.
- Evaluate integrals by using Fundamental Theorem of Calculus.
- Describe the area and volume of revolution
- Apply Integration to compute areas and Volumes by slicing, Volume of revolution and surface of area of revolution.
- Explain the role of integration in the study of work and give examples.
- Locate the center of gravity by applying integrals.
- Define and calculate an integral numerically to a given degree of accuracy.
- Analyze and evaluate improper integrals.
- Describe polar coordinates.

IV. **Required Text:**

- Calculus, Howard Anton, John Wiley & Sons, 2009

V. **References:**

- Calculus: Early Transcendentals, James Stewart, Thomson Brooks/Cole, 2007.