

1. Course Number and Name: 113 MATH – Differentiation and Integration

2. Credits and Contact Hours: 3 Credit

- a. Lecture – 3 day per week at 50 minutes for 16 weeks
- b. Laboratory – Nil

3. Course Coordinator or Instructor:

Department of Mathematics, College of Science

4. Text Book:

- E. W. Swokowski, M. Olinick, D. Pence & J. A. Cole, Calculus, 6th Edition, PWS Publishing Company, Boston. 1994.
- R. A. Hunt, Calculus with Analytic Geometry. Harper and Row Publisher, 1988.

5. Specific Course Information:

- a. **Catalog Description:** This course is focus on differentiation and integration of functions, with applications. Informal treatment of limits and continuity. Differentiation: definition, rules, rates, approximations, and extremism problems, implicit differentiation, higher derivatives. Indefinite integration; Definite integral; fundamental theorem of calculus, integration by substitution.
- b. **Prerequisites:** 112 MATH Linear Algebra
- c. **Status:** Required

6. Specific Goals for the Course: See the Mapping in First Page of College Requirement Courses

7. List of Topics:

- Anti-derivatives, indefinite integrals
- Definite integral
- Properties of definite integrals, fundamental theorem of calculus
- Applications of definite integrals: Area, Solids ad Surface of revolution, Arc Length and surface of revolution
- The inverse function and its derivative, the natural logarithm function
- The exponential function, integration using natural logarithm and exponential functions
- General exponential function and logarithm functions, Inverse of trigonometric functions, Hyperbolic and inverse hyperbolic functions, integration by parts
- Trigonometric integrals, trigonometric substitutions, Integration of rational functions, Quadratic expressions