Appendix I  Civil Engineering: ABET Self-Study Report - 2007

(1)  
**Department:** Mechanical and Industrial Engineering  
**Number:** BE 3341  
**Title:** Engineering Analysis

(2)  
**Required or Elective Course**  
Required

(3)  
**Catalog Description:**  
Applications of mathematical principles to the analysis of engineering problems: derivation and solution of mathematical models of physical systems, closed-form solutions, computer solutions by programming in a higher language and by using mathematical computer packages.

(4)  
**Prerequisites:**  
MATH 2313 and MATH 2326, each with a grade of “C” or better.

(5)  
**Textbook:**  

(6)  
**Course Objectives:** Students completing BE 3341 will:  
Be able to apply mathematical techniques learned in Calculus and Differential Equations.  
Be able to write and debug “C” program to the roots of algebraic and transcendental equations by the False Position technique, the Half Interval technique, and the Newton-Rhapson technique; find the integral of algebraic and transcendental functions by means of Simpson’s 1/3 and Simpson’s 3/8 Rule; solve for a system of simultaneous linear equations; convert data points into an equation by means of least squares; solve a 1st order initial value ordinary differential equation; solve higher order ordinary differential equations.  
Be able to write and debug the same programs in Mat Lab.

(7)  
**Topics covered:**  
Numerical techniques for the solution of transcendental equations.  
Numerical techniques for integration and differentiation.  
Matrix algebra needed for the solution of systems of linear algebraic equations.  
Numerical techniques for the solution of systems of simultaneous linear equations.  
Numerical techniques for curve fitting.  
Numerical techniques for the solution of ordinary differential equations.

(8)  
**Class/Laboratory Schedule:**  
Three 50 minute or two 80 minute lectures per week.
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(9) Contribution of course to meeting the professional component:
BE 3341 is a required upper division course that contributes to the engineering topics requirement.

(10) Prepared by:
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