

ENFP201 Numerical Methods with MatLab

Credits: Three (3)

Contact hours: Two lectures per week, 75 minutes each

Table 5-1 category: math and basic science

Instructor: Stoliarov

Textbook: S. C. Chapra, *Applied Numerical Methods with MatLab for Engineers and Scientists*, 4th Edition, McGraw Hill, ISBN 978-0-07-339796-2

Other supplemental materials: None

Catalog description:

A broad range of numerical methods are illustrated and applications related to engineering problems are implemented using MatLab thus providing a working knowledge of this computational tool. The topics covered in the course include: finding roots of equations with bracketing and open methods; solving linear systems of equations with matrices, Gauss elimination, LU decomposition, and iterative methods; linear regression, polynomial interpolation; numerical integration and numerical differentiation; ordinary and partial differential equations. Additional topics such as optimization, eigenvalues, Fourier analysis, splines, and Romberg integration may be included as time allows.

Prerequisites and Corequisites: Prerequisite: MATH141. Restriction: Must be in Engineering: Fire Protection program.

Table 5-1 Course Type: Required

Specific outcomes of instruction: The students will learn numerical methods frequently used to solve engineering problems and will be taught how to implement these methods in MatLab.

Student outcomes assessed: SO1

Brief list of topics covered: Mathematical modeling; numerical methods and problem solving; MatLab fundamentals; Roundoff and truncation errors; Roots: bracketing and open methods; Numerical differentiation and integration; Gauss elimination and iterative methods for linear systems of equations; Regression and interpolation; Ordinary differential equations; Partial differential equations.