

NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY

MEC 270- COMPUTATIONS FOR ENGINEERING TECHNOLOGY (3 CR.)

Course Description

Presents the use of spreadsheets and Matlab or equivalent to solve a variety of problems in introductory engineering analysis, such as graphing data, unit conversions, simple statistical analysis, sorting, searching and analyzing data, curve fitting, interpolation, solving algebraic equations, logical decisions, evaluating integrals, comparing economic alternatives, and finding optimum solutions. The acquisition and processing of data as well as macro programming in Basic are also covered. Lecture 2 hours. Laboratory 2 hours. Total 4 hours per week.

General Course Purpose

This course is designed to teach students the use of software tools for solving engineering problems. Students will use built-in and user-defined functions in Excel such as matrix, standard math functions, integral and derivatives, and curve fitting to solve typical engineering problems. Students will use VBA programming to create user-defined functions for problem-solving.

Course Prerequisites/Corequisites

None

Course Objectives

After the completion of this course the students will be able to:

- Perform basic tasks in Excel
- Solve a system of equations using Excel
- Solve and analyze different types of matrices
- Explain and use built-in Excel functions, such as “Sum,” “Average,” “IF,” “IFS,” “AND,” “OR,” “PMT,” etc.
- Solve and explain engineering problems using Excel
- Explain curve fitting and regression
- Explain and create charts from “DATA.”
- Solve and analyze integral and derivatives using Excel
- Record and explain Excel macro programming
- Perform different Excel VBA programming tasks
- Explain Excel VBA “Arrays,” “Loops,” “Input and message box.”
- Utilize user forms for creating VBA controlled workbooks to solve engineering problems

Major Topics to be Included

Critical attention will be given to the following topics:

- Review of Excel
- Basic Excel built-in functions
- Solving and analyzing matrices using Excel functions
- Advance Excel built-in functions
- Excel charts and Excel macros
- Curve fitting and regression using Excel
- Solving integral and derivatives using Excel
- Introduction to Excel VBA
- VBA Arrays, Loops, functions, IF-Else, Button and Boxes
- Advance macros using VBA
- Creating user forms using VBA
- Excel workbook flow control using VBA