Al-Hussein Bin Talal University		**Faculty of Engineering**

Department of Mechanical Engineering.

Course Syllabus

Course title: Computer Programming for Engineers	**Course No. /Code:** 0507281
Course pre-requisite: : 0612114	**Course teaching language:** English
Course level: Second year	**Credit hours:** 2 hours

Course Description:

A systematic development of programming via flowcharts and pseudo codes; The course highlights include: assignment, repetition, decision making, arrays, file processing and subprograms in program construction. Program design includes: algorithm design, procedures and data program structure, module design, programming standards, program documentation, testing, debugging, verification and validation, file organization and processing, array processing, abstract data structures, data driven programs and simulation. Matlab language will be used. Homework problems and projects of direct engineering applications will be assigned.

Course objectives:

1.	To find solution for systems of linear algebraic equations using MATLAB. Matrices, arrays, and mathematical operations with vectors & matrices and determination of Zeroes of functions.
2.	To use MATLAB to integrate and differentiate numerically.
3.	To use MatLab to solve mathematical problems.
4.	To write and read from Excel sheets using MATLAB built-in functions.
5.	To visualize data using MATLAB plot functions. Learn simple and advanced plotting techniques.
6.	To use MATLAB for simple programs FOR/IF/WHILE loops.
7.	To use MATLAB to study powerful techniques to deal with discrete data. Learn MATLAB functions to perform both curve fitting and interpolation

Learning outcomes (understanding, knowledge and practical skills):

Upon completing this course, the student is expected to be able to:

1.	Find solution for systems of linear algebraic equations using MATLAB. Matrices, arrays, and mathematical operations with vectors & matrices and determination of Zeroes of functions.
2.	Use MATLAB built-in functions and techniques generate histogras and other Statistical analysis.
3.	Numerical differentiation and integration. Use MATLAB to integrate and

	differentiate numerically . Learn how to compute the derivative of specified functions, and how to find the integral (area under the curve) of a given function and data points. Compare the results obtained using MATLAB (numerically) to analytical solution. Use MATLAB built-in functions to solve a set of ordinary differential equations (ODEs) numerically.
4.	Use MatLab to solve mathematical problems. Find root of nonlinear algebraic equations in single variable using MATLAB built-in functions.
5.	Use Simulink to model, analyze and simulate dynamic systems using block diagrams.
6.	Write and read from Excel sheets using MATLAB built-in functions.
7.	Visualize data using MATLAB plot functions. Learn simple and advanced plotting techniques.
8.	simple programs using MATLAB FOR/IF/WHILE loops. Calling functions in MATLAB.
9.	Use MATLAB built-in functions and techniques to do statistical analysis on given data.
10.	Use MATLAB to study powerful techniques to deal with discrete data. Learn MATLAB functions to perform both curve fitting and interpolation.

Textbook & references:

Book title	Author (s)	Publisher	Edition
Introduction to Matlab for Engineers	C William J. Palm III	McGraw-Hill	3rd
MATLAB Programming for Engineers	S. J. Chapman.	Thomson	2nd

Assessment Methods:

Assessment no.	Assessment Method	Week Due	Allocated Mark
1	Class works	-	10
2	Mid exam	10th week	30
3	Assignments	-	10
4	Final exam	17th week	50