First Semester 2013-2014
Course Syllabus

Course: Engineering Mathematics II. Course No. : (30202205)
Course Pre requisite: Engineering Mathematics I (30202204).

COURSE DESCRIPTION:
Vector calculus, Line and surface integrals. The three main theorems: Green theorem, Stokes theorem and divergence theorem. Fourier series, integrals and transforms. Partial differential equations solutions using Fourier series and transforms

Instructor: MEng. Samah Massadeh.
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Facebook: https://www.facebook.com/smassadeh

Class Meetings: Monday, Wednesday 9:30-11:00.

Course Requirements:

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<tr>
<th>Class Participation</th>
<th>Regular attendance is required and class participation is expected.</th>
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<tr>
<td>Attendance Policy</td>
<td>A student is expected to attend each session on a regular and punctual basis in order to obtain the educational benefits, which each meeting affords, students who exceed the absences limits set by BAU will be treated according to BAU regulations to such students.</td>
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<tr>
<td>Cheating</td>
<td>A student who cheats or copies in an examination or an assignment will be treated according to BAU regulations to such students.</td>
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Text Book & Reference: ADVANCED ENGINEERING MATHEMATICS ERWIN KREYSZIG , 10th edition JOHN WILEY & SONS, INC.
Course Outline

I. Linear Algebra:
   1. Linear Systems of Equations. Gauss Elimination
   2. The Matrix Eigenvalue Problem.
   3. Determining Eigenvalues and Eigenvectors.
   4. Some Applications of Eigenvalue Problems.

II. Vector Differential Calculus:
   1. Vectors in 2-Space and 3-Space
   2. Inner Product (Dot Product)
   3. Vector Product (Cross Product)
   4. Vector and Scalar Functions and Their Fields. Vector Calculus:
       Derivatives.
   6. Gradient of a Scalar Field.
   7. Directional Derivative.
   8. Divergence of a Vector Field.
   9. Curl of a Vector Field.

III. Fourier transform:
   1. Using Matlab to solve Fourier transform and discrete Fourier transform.

IV. Partial Differential Equations (PDEs):
   1. Basic Concepts of PDEs.
   2. Matlab for PDEs.

V. Graphs, Combinatorial Optimization:
   1. Graphs and Digraphs.
   3. Bellman’s Principle, Dijkstra’s Algorithm.
   5. Shortest Spanning Trees: Prim’s Algorithm.