**Jerash University**

**College of Engineering**

**Course Syllabus**

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| **0903402 Engineering Mechanics** |  |  |

**Description**: Force vectors and resultant. Free-body diagram of forces and equilibrium of particles and rigid bodies. Moment of a force about a point and about an axis. Equilibrium of rigid body. Analysis of trusses and frames. Shear forces diagrams and bending moment diagrams. Center of area and moment of inertia of an area. Simple states of stress and strain; Hook’s law; torsional stresses; axial deformation; internal forces in beams; bending and shearing diagrams and stresses; beam design; stress transformation; thin-walled pressure vessels; beam deflection.

**Pre-requisite:** General physics 0304101

**Student Assessment and Grading:** Assignments and term paper (20%), 2 Exams @ 20% each (40%), Final Exam (40%)

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| **0903402** | **Engineering Mechanics** |

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| Catalog Data | **0903402**  **Engineering Mechanics** | (3 – 0 : 3) |
| Force vectors and resultant. Free-body diagram of forces and equilibrium of particles and rigid bodies. Moment of a force about a point and about an axis. Equilibrium of rigid body. Analysis of trusses and frames. Shear forces diagrams and bending moment diagrams. Center of area and moment of inertia of an area. Simple states of stress and strain; Hook’s law; torsional stresses; axial deformation; internal forces in beams; bending and shearing diagrams and stresses; beam design; stress transformation; thin-walled pressure vessels; beam deflection. | |

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| Goals | Furnish the student with basic understanding of the force vectors, resultant and resolution of a force; Determine the moments of a force about a point and axis; Determine the reactions of a rigid body; Analysis of trusses and frames; Drawing shear force and bending moment diagrams of a beam; Determine the centroid and moment of inertia of a composite area, develop the ability to analyze and design simple structural members under various loading conditions and imposed constraints. Develop a strong understanding of materials behavior and response (deformation, stresses, and failure) due to various loading conditions (axial, torsion, bending, shear) applied individually or in combinations to structural members. Develop the ability to analyze and design simple structural members under various loading conditions and imposed constraints. |

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| Assessment and Grading | Assignments.………. 10% | 2 exams @ 20% each ………… 40%  Final Exam ……………………. 50% |

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| Textbook | Beer and Johnston, Vector Mechanics for Engineers, STATICS (6th Ed.) McGraw-Hill Companies, Inc. |
| Reference | 1. Vectors Mechanics for engineers, Statics by Hibbler.  2. Handout Materials  3. Statics by Mariam |