**Philadelphia University**

Faculty of Engineering - Department of Mechanical Engineering

First Semester 2017/2018



**Course Information**

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| **Title:** | Mechanics of materials (620213) | |
| **Prerequisite:** | statics ( 620211 ) | |
| **Credit Hours:** | 3 credit hours (16 weeks per semester, approximately 44 contact hours) | |
| **Textbook:** | Mechanics of Materials -12th edition by R. C. Hibbeler |
| **References:** | Mechanics of Materials- 4th edition Gear |
| **Description:** | The course is a requirement for Mechanical and Civil engineering students. It introduces concept of stress, stress and strain, mechanical properties of materials, axial loading, torsion, pure bending, analysis and design of beam for bending, shear stress in beams, transformation of stress and strain, deflection of beams, columns, energy methods . |
| **Instructor:** | **Dr. Nabil Musa**  **Office**: Mechanical Engineering building, room E61206 , ext. : 2543  **Office hours**: Sun, Tue, Thu: 10:00-11:00 |

**Course Topics:**

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| **Week** | **Topic** |
| **1** | - Introduction and Basic Concepts of Solid Mechanics |
| **2** | - Stress and strain |
| **3** | - Mechanical properties of materials |
| **4** | - Axial loading |
| **5** | - Torsion |
| **6** | - analysis and design of beam for bending |
| **7,8** | -. shear stress in beams |
| **9** | - Transverse shear |
| **10** | - Strain transformation |
| **11, 12, 13** | - transformation of stress and strain |
| **14, 15** | - Deflection of beams. |
| **16** | - Columns, energy methods |

**Course Learning Outcomes and Relation to ABET Student Outcomes:**

Upon successful completion of this course, a student should be able to:

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| 1. | Introduction and Basic Concepts of Solid Mechanics, Stress and strain . | [a, e, k] |
| 2. | Mechanical properties of materials, Axial loading. | [a, e, k] |
| 3. | Torsion, analysis and design of beam for bending. | [a , e, k] |
| 4. | shear stress in beams, Transverse shear, Strain transformation. | [a , e, k] |
| 5. | transformation of stress and strain, Deflection of beams, Columns, energy methods | [g] |

**Assessment Instruments:**

Evaluation of students’ performance (final grade) will be based on the following categories:

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| **Exams:** | Two written exams will be given. Each will cover about 3-weeks of lectures |
| **Quizzes**: | 10-minute quizzes will be given to the students during the semester. These quizzes will cover material discussed during the previous lecture(s). |
| **Homework**: | Problem sets will be given to students. Homework should be solved individually and submitted before the due date.  Copying homework is forbidden, any student caught copying the homework or any part of the homework will receive zero mark for that homework |
| **Participation:** | Questions will be asked during lecture and the student is assessed based on his/her response |
| **Final Exam:** | The final exam will cover all the class material. |

**Grading policy:**

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| First Exam | 20% |
| Second Exam | 20% |
| Home works, Quizzes and participation | 20% |
| Final Exam | 40% |
| Total: | 100% |

**Attendance policy:**

Absence from classes and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse, acceptable to and approved by the Dean of the relevant college/faculty, shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

September , 2017