

**Department of Mining, Petroleum and Metallurgical Engineering**

**Cairo University  
Faculty of Engineering**

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| **Course Specifications** | | | | | | | | | | | | | | | | | |
| **Program(s) on which this course is given:** | | | | | | | Materials and Metallurgical Engineering | | | | | | | | | | |
| **Department offering the program:** | | | | | | | Department of Mining, Petroleum and Metallurgical Engineering | | | | | | | | | | |
| **Department offering the course:** | | | | | | | Department of Mining, Petroleum and Metallurgical Engineering | | | | | | | | | | |
| **Academic Level:** | | | | | | | 2nd Year | | | | | | | | | | |
| **Date** | | | | | | | 2014 | | | | | | | | | | |
| **Semester (based on final exam timing)** | | | | | | | Fall Spring | | | | | | | | | | |
| **A- Basic Information** | | | | | | | | | | | | | | | | | |
| **1. Title:** | **Principles of Mechanical Engineering** | | | | | | | | | **Code:** | | | MDP222 | | | | |
| **2. Units/Credit hours per week:** | | Lectures | | | 3 | | | Tutorial | | | 2 | Practical | | **2** | | Total | 5 |
| **B- Professional Information** | | | | | | | | | | | | | | | | | |
| **1. Course description:** | | | | Quantitative & theoretical Study of the Machine design - Design and power consumption - Power consumption in materials transport.  Introduction to thermodynamics - Applications of the first and second law of thermodynamics - Cycles - Internal combustion engines - Compressors, rotary and reciprocationg. Boilers, steam generation nd Applications. | | | | | | | | | | | | | |
| **2. Intended Learning Outcomes of Course (ILOs):** | | | | **a) Knowledge and Understanding** | | | | | | | | | | | | | |
| 1. Shaping and manufacturing methods. | | | | | | | | | | | | | |
| **b) Intellectual Skills** | | | | | | | | | | | | | |
| 2. Select and identify the appropriate material and manufacturing aspects of design of a component.  3. Assess and evaluate the characteristics, performance and failure of components, systems and processes  4. Solve engineering problems, often on the basis of limited and possibly contradicting information appreciating the role of information technology in providing support for metallurgical engineers. | | | | | | | | | | | | | |
| **c) Professional and Practical Skills** | | | | | | | | | | | | | |
| 5. Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services  6. Create and/or re-design a process, component or system, and carry out specialized engineering designs considering safety, quality assurance procedures, management skills and environmental aspects | | | | | | | | | | | | | |
| **d) General and Transferable Skills** | | | | | | | | | | | | | |
| 7. Collaborate effectively within multidisciplinary team in stressful environment and within constraints and effectively manage tasks, time, and resources | | | | | | | | | | | | | |
| **3. Contents** | | | | | | | | | | | | | | | | | |
| **Topic** | | | | | | **Total hours** | | | **Lectures hours** | | | | | | **Tutorial/ Practical hours** | | |
| Machine design | | | | | | 12 | | | 8 | | | | | | 4 | | |
| Power consumption in materials transport | | | | | | 18 | | | 12 | | | | | | 6 | | |
| Introduction to thermodynamics - Applications of the first and second law of thermodynamics | | | | | | 24 | | | 16 | | | | | | 8 | | |
| Cycles - Internal combustion engines | | | | | | 6 | | | 4 | | | | | | 2 | | |
| Boilers, steam generation nd Applications | | | | | | 8 | | | 6 | | | | | | 2 | | |
| **4. Teaching and Learning Methods** | | | | | | Lectures ( ) | | | Practical Training/ Laboratory ( ) | | | | | | Seminar/Workshop ( ) | | |
| Class Activity ( ) | | | Case Study ( ) | | | | | | Projects ( ) | | |
| E-learning ( ) | | | Assignments /Homework ( ) | | | | | | Other: | | |
| **5. Student Assessment Methods** | | | | | | | | | | | | | | | | | |
| * **Assessment Schedule** | | | | | | | | | **Week** | | | | | | | | |
| -Assessment 1; Class test | | | | | | | | |  | | | | | | | | |
| -Assessment 2; Project Assignment | | | | | | | | |  | | | | | | | | |
| -Assessment 3; Presentations | | | | | | | | |  | | | | | | | | |
| -Assessment 3; Midterm Exam | | | | | | | | |  | | | | | | | | |
| -Assessment 4; Final Exam | | | | | | | | |  | | | | | | | | |
| * **Weighting of Assessments** | | | | | | | | | | | | | | | | | |
| -Mid-Term Examination | | | | | | | | | 14% | | | | | | | | |
| -Final-term Examination | | | | | | | | | 70% | | | | | | | | |
| -Project | | | | | | | | |  | | | | | | | | |
| -Class Test | | | | | | | | | 11% | | | | | | | | |
| -Presentation | | | | | | | | | 5% | | | | | | | | |
| -Total | | | | | | | | | 100% | | | | | | | | |
| **6. List of References** | | | | | | | | | | | | | | | | | |
| Class Notes | | | | | | | | | | | | | | | | | |
| **7. Facilities Required for Teaching and Learning** | | | | | | | | | | | | | | | | | |
| White Board | | | | | | | | | | | | | | | | | |
| **Course Coordinator:** | | | **Prof. Dr. Abdel-Motteleb Ali Mostafa & Prof. Dr. Morsy Ammar** | | | | | | | | | | | | | | |
| **Head of Department:** | | | **Prof. Dr. El-Sayed El-Banna** | | | | | | | | | | | | | | |

