

**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:** | | | | | | | Mining, Petroleum, and MetallurgicalEngineering | | | | | | | | | | |
| **Department offering the program:** | | | | | | | Mining, Petroleum, and MetallurgicalEngineering | | | | | | | | | | |
| **Department offering the course:** | | | | | | | Engineering Mathematics and Physics | | | | | | | | | | |
| **Academic Level:** | | | | | | | first year | | | | | | | | | | |
| **Date** | | | | | | | 2014 | | | | | | | | | | |
| **Semester (based on final exam timing)** | | | | | | | Fall Spring | | | | | | | | | | |
| **A- Basic Information** | | | | | | | | | | | | | | | | | |
| **1. Title:** | Mechanics | | | | | | | | | **Code:** | | | **Mech120** | | | | |
| **2. Units/Credit hours per week:** | | Lectures | | | 2 | | | Tutorial | | | 2 | Practical | | **-** | | Total | 4 |
| **B- Professional Information** | | | | | | | | | | | | | | | | | |
| **1. Course description:** | | | | Development of the student's ability to analyze problems in Rigid body dynamics in a simple and logical manner, and apply well understood basic principles to solve them. | | | | | | | | | | | | | |
| **2. Intended Learning Outcomes of Course (ILOs):** | | | | **a) Knowledge and Understanding** | | | | | | | | | | | | | |
| 1- Concepts and theories of mathematics and sciences, appropriate to the discipline. | | | | | | | | | | | | | |
| 2- Characteristics of engineering materials related to the discipline | | | | | | | | | | | | | |
| 3- Principles of design including elements design, process and/or a system related to specific disciplines. | | | | | | | | | | | | | |
| 4- Methodologies of solving engineering problems, data collection and interpretation | | | | | | | | | | | | | |
| 5 - Contemporary engineering topics | | | | | | | | | | | | | |
| **b) Intellectual Skills** | | | | | | | | | | | | | |
| 6- Select appropriate mathematical and computer-based methods for modeling and analyzing problems. | | | | | | | | | | | | | |
| 7- Select appropriate solutions for engineering problems based on analytical thinking. | | | | | | | | | | | | | |
| 8- Think in a creative and innovative way in problem solving and design. | | | | | | | | | | | | | |
| 9- Combine, exchange, and assess different ideas, views, and knowledge from a range of sources. | | | | | | | | | | | | | |
| 10- Assess and evaluate the characteristics and performance of components, systems and processes. | | | | | | | | | | | | | |
| 11- Investigate the failure of components, systems, and processes. | | | | | | | | | | | | | |
| **c) Professional and Practical Skills** | | | | | | | | | | | | | |
| 12- Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. | | | | | | | | | | | | | |
| 13- Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. | | | | | | | | | | | | | |
| 14- Create and/or re-design a process, component or system, and carry out specialized engineering designs. | | | | | | | | | | | | | |
| 15- Exchange knowledge and skills with engineering community and industry. | | | | | | | | | | | | | |
| 16- Prepare and present technical reports. | | | | | | | | | | | | | |
| **d) General and Transferable Skills** | | | | | | | | | | | | | |
| 17- Collaborate effectively within multidisciplinary team. | | | | | | | | | | | | | |
| 18- Communicate effectively. | | | | | | | | | | | | | |
| 19- Acquire entrepreneurial skills. | | | | | | | | | | | | | |
| 20- Refer to relevant literatures. | | | | | | | | | | | | | |
| **3. Contents** | | | | | | | | | | | | | | | | | |
| **Topic** | | | | | | **Total hours** | | | **Lectures hours** | | | | | | **Tutorial/ Practical hours** | | |
| Basic Concepts | | | | | | 4 | | | 2 | | | | | | 2 | | |
| Rigid body Motion in the Plane | | | | | | 4 | | | 2 | | | | | | 2 | | |
| Velocity and Acceleration | | | | | | 12 | | | 6 | | | | | | 6 | | |
| Center of Mass | | | | | | 8 | | | 4 | | | | | | 4 | | |
| Mass moment of Inertia | | | | | | 8 | | | 4 | | | | | | 4 | | |
| Equations of Motion | | | | | | 12 | | | 6 | | | | | | 6 | | |
| **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 | | | | | | | | | 4,17 | | | | | | | | |
| -Assessment 2; Project Assignment | | | | | | | | |  | | | | | | | | |
| -Assessment 3; Presentations | | | | | | | | |  | | | | | | | | |
| -Assessment 3; Midterm Exam | | | | | | | | | 7,22 | | | | | | | | |
| -Assessment 4; Final Exam | | | | | | | | | 30 | | | | | | | | |
| * **Weighting of Assessments** | | | | | | | | | | | | | | | | | |
| -Mid-Term Examination | | | | | | | | | 20% | | | | | | | | |
| -Final-term Examination | | | | | | | | | 60% | | | | | | | | |
| -Project | | | | | | | | |  | | | | | | | | |
| -Class Test | | | | | | | | | 10% | | | | | | | | |
| -Presentation | | | | | | | | |  | | | | | | | | |
| -Total | | | | | | | | |  | | | | | | | | |
| **6. List of References** | | | | | | | | | | | | | | | | | |
| Lecture notes | | | | | | | | | | | | | | | | | |
| Engineering Mechanics 2 | | | | | | | | | | | | | | | | | |
| Solved problems in Rigid Body Dynamics | | | | | | | | | | | | | | | | | |
| Vector Mechanics for Engineers (Dynamics), Beer and Johnston, McGraw-Hill | | | | | | | | | | | | | | | | | |
| **7. Facilities Required for Teaching and Learning** | | | | | | | | | | | | | | | | | |
| 1. Available Chalkboard class rooms 2. Recommended Data show for classrooms new traditional Labs. as well as new computer Labs. | | | | | | | | | | | | | | | | | |
| **Course Coordinator:** | | |  | | | | | | | | | | | | | | |
| **Head of Department:** | | | Prof. Dr. E.M.Elbana | | | | | | | | | | | | | | |

