

**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**
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| -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.
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| **Course Coordinator:** |  |
| **Head of Department:**  | Prof. Dr. E.M.Elbana |

