

**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:** | | | | | | | Fifth year | | | | | | | | | | |
| **Date** | | | | | | | 2014 | | | | | | | | | | |
| **Semester (based on final exam timing)** | | | | | | | Fall Spring | | | | | | | | | | |
| **A- Basic Information** | | | | | | | | | | | | | | | | | |
| **1. Title:** | Advanced Materials | | | | | | | | | **Code:** | | | **MET 445** | | | | |
| **2. Units/Credit hours per week:** | | Lectures | | | 3 | | | Tutorial | | | 1 | Practical | | - | | Total | 4 |
| **B- Professional Information** | | | | | | | | | | | | | | | | | |
| **1. Course description:** | | | |  | | | | | | | | | | | | | |
| **2. Intended Learning Outcomes of Course (ILOs):** | | | | **a) Knowledge and Understanding** | | | | | | | | | | | | | |
| 1. Fundamental properties of nano materials (thermodynamic, mechanical, electronic, magnetic, optical and bio-chemical properties). | | | | | | | | | | | | | |
| 2. Applications of nano materials, ceramics and polymers | | | | | | | | | | | | | |
| 3. Processing of ceramic and polymeric materials. | | | | | | | | | | | | | |
| 4. Mechanical properties of ceramic and polymeric materials. | | | | | | | | | | | | | |
| 5. Coating | | | | | | | | | | | | | |
| **b) Intellectual Skills** | | | | | | | | | | | | | |
| 6. Identifying different methods for synthesis, characterization of nano materials | | | | | | | | | | | | | |
| 7. Identifying most advanced nano fabrication methods | | | | | | | | | | | | | |
| 8. Identifying different Processing techniques for polymers and ceramics | | | | | | | | | | | | | |
| **c) Professional and Practical Skills** | | | | | | | | | | | | | |
| 9. How are electronic devices manufactured. | | | | | | | | | | | | | |
| 10. Processing techniques for ceramics and polymers. | | | | | | | | | | | | | |
| **d) General and Transferable Skills** | | | | | | | | | | | | | |
| 11. Working in a team. | | | | | | | | | | | | | |
| 12. Presenting a report. | | | | | | | | | | | | | |
| **3. Contents** | | | | | | | | | | | | | | | | | |
| **Topic** | | | | | | **Total hours** | | | **Lectures hours** | | | | | | **Tutorial/ Practical hours** | | |
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| **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 | | | | | | | | |  | | | | | | | | |
| -Final-term Examination | | | | | | | | |  | | | | | | | | |
| -Project | | | | | | | | |  | | | | | | | | |
| -Class Test | | | | | | | | |  | | | | | | | | |
| -Presentation | | | | | | | | |  | | | | | | | | |
| -Total | | | | | | | | |  | | | | | | | | |
| **6. List of References** | | | | | | | | | | | | | | | | | |
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| **7. Facilities Required for Teaching and Learning** | | | | | | | | | | | | | | | | | |
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| **Course Coordinator:** | | |  | | | | | | | | | | | | | | |
| **Head of Department:** | | |  | | | | | | | | | | | | | | |

