

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

**Cairo University  
Faculty of Engineering**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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:** | **Physical and electro chemistry** | | | | | | | | | **Code:** | | | MET201A | | | | |
| **2. Units/Credit hours per week:** | | Lectures | | | 4 | | | Tutorial | | | 2 | Practical | | **0** | | Total | 6 |
| **B- Professional Information** | | | | | | | | | | | | | | | | | |
| **1. Course description:** | | | | The aim of this course is to establish the relations which exist between the equilibrium state of existence of a given system and the influences which are brought to bear on the system | | | | | | | | | | | | | |
| **2. Intended Learning Outcomes of Course (ILOs):** | | | | **a) Knowledge and Understanding** | | | | | | | | | | | | | |
| 1. Engineering principles and Basic topics related with metals and alloys. | | | | | | | | | | | | | |
| **b) Intellectual Skills** | | | | | | | | | | | | | |
| 2. Think in a creative and innovative way in problem solving and design considering quality assurance systems, codes of practice and standards, health and safety requirements, professional ethics and impacts of engineering solutions on society and environment.  3. 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.  4. Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact | | | | | | | | | | | | | |
| **c) Professional and Practical Skills** | | | | | | | | | | | | | |
| 5. Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services  6. Prepare and present technical reports observing ethical aspects and using proper referencing and citation | | | | | | | | | | | | | |
| **d) General and Transferable Skills** | | | | | | | | | | | | | |
| 7. Collaborate effectively within multidisciplinary team in stressful environment and within constraints and effectively manage tasks, time, and resource  8. Communicate effectively  9. Search for information and engage in life-long self learning discipline. | | | | | | | | | | | | | |
| **3. Contents** | | | | | | | | | | | | | | | | | |
| **Topic** | | | | | | **Total hours** | | | **Lectures hours** | | | | | | **Tutorial/ Practical hours** | | |
| 1. Properties of gas. | | | | | | 12 | | | 8 | | | | | | 4 | | |
| 1. 1 st Law of thermodynamics | | | | | | 12 | | | 8 | | | | | | 4 | | |
| 1. 2 nd Law of Thermodynamics | | | | | | 12 | | | 8 | | | | | | 4 | | |
| 1. 3 rd law of thermodynamics | | | | | | 12 | | | 8 | | | | | | 4 | | |
| 1. Auxilary Functions | | | | | | 12 | | | 8 | | | | | | 4 | | |
| 1. Kinetics | | | | | | 12 | | | 8 | | | | | | 4 | | |
| 1. Galvanic Cells | | | | | | 12 | | | 8 | | | | | | 4 | | |
| **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 | | | | | | | | | 4th and 11th week | | | | | | | | |
| -Assessment 2; Project Assignment | | | | | | | | |  | | | | | | | | |
| -Assessment 3; Presentations | | | | | | | | | Weekly | | | | | | | | |
| -Assessment 3; Midterm Exam | | | | | | | | | 9th Week | | | | | | | | |
| -Assessment 4; Final Exam | | | | | | | | | End of term | | | | | | | | |
| * **Weighting of Assessments** | | | | | | | | | | | | | | | | | |
| -Mid-Term Examination | | | | | | | | | 13% | | | | | | | | |
| -Final-term Examination | | | | | | | | | 66% | | | | | | | | |
| -Project | | | | | | | | |  | | | | | | | | |
| -Class Test | | | | | | | | | 8% | | | | | | | | |
| -Presentation | | | | | | | | | 13% | | | | | | | | |
| -Total | | | | | | | | | 100% | | | | | | | | |
| **6. List of References** | | | | | | | | | | | | | | | | | |
| * Course Notes | | | | | | | | | | | | | | | | | |
| * Essential Books (Text Books) | | | | | | | | | | | | | | | | | |
| * Introduction to Metallurgical Thermodynamics by David R. Gaskell | | | | | | | | | | | | | | | | | |
| * Recommended Books. | | | | | | | | | | | | | | | | | |
| * Suggested by the Academic Advisor | | | | | | | | | | | | | | | | | |
| * Periodicals, Web Sites, … etc: N/A | | | | | | | | | | | | | | | | | |
| **7. Facilities Required for Teaching and Learning** | | | | | | | | | | | | | | | | | |
| Small group of students. | | | | | | | | | | | | | | | | | |
| Screen - Data Show | | | | | | | | | | | | | | | | | |
| **Course Coordinator:** | | | **Prof. Dr. Fawzy El-Refaie** | | | | | | | | | | | | | | |
| **Head of Department:** | | | **Prof. Dr. El-Sayed El-Banna** | | | | | | | | | | | | | | |

