

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

**Cairo University
Faculty of Engineering**

|  |
| --- |
| **Course Specifications PHY 120A** |
| **Program(s) on which this course is given:** | Metallurgical Engineering |
| **Department offering the program:** | Department of Mining, Petroleum and Metallurgical Engineering |
| **Department offering the course:** | Metallurgical Engineering |
| **Academic Level:** | First year |
| **Date**  | 2014 |
| **Semester (based on final exam timing)** |  Fall Spring |
| **A- Basic Information** |
| **1. Title:** | Physics 2 | **Code:** | PHY 120 A |
| **2. Units/Credit hours per week:**  | Lectures | 3 | Tutorial | 1 | Practical | **1** | Total | 5 |
| **B- Professional Information** |
| **1. Course description:** | In this course, the student should learn the basics of physical optics. He gets sufficient knowledge about interference, diffraction, polarization, electromagnetic waves, magnetic circuits and oscillatory circuits and electronic amplifiers. In addition, the student learns an introduction to the modern physics including the electron emission, Bohr’s theory, wave particle duality, De Brogile relations, postulates of quantum mechanics and nuclear reaction. |
| **2. Intended Learning Outcomes of Course (ILOs):** | **a) Knowledge and Understanding** |
| 1. The role of information technology in providing support for metallurgical engineers. |
| 2. Processing of metals and alloys. |
| 3. Current engineering technologies related to metallurgical engineering. |
| 4. Technical language and report writing |
| **b) Intellectual Skills** |
| 5. Assess and evaluate the characteristics and performance of components, systems and processes. |
| 6. Propose and assess options for the improvement of operations. |
| 7. Explain experimental results in terms of theoretical mechanisms and concepts. |
| **c) Professional and Practical Skills** |
| 8. Apply knowledge of mathematics, science, information technology, design, business context and engineering practice integrally to solve engineering problems. |
| 9. Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. |
| 10. Create and/or re-design a process, component or system, and carry out specialized engineering designs. |
| 11. Exchange knowledge and skills with engineering community and industry. |
| 12. Prepare and present technical reports. |
| 13. Apply of modern science and engineering in the discovery, development, exploitation, and use of natural mineral deposits. |
| **d) General and Transferable Skills** |
| 14. Collaborate effectively within multidisciplinary team. |
| 15. Communicate effectively. |
| 16. Refer to relevant literatures. |
| **3. Contents** |
| **Topic** | **Total hours** | **Lectures hours** | **Tutorial/ Practical hours** |
| A.C. circuits and amplifiers | 8 | 6 | 2 |
| Interference of light  | 16 | 12 | 4 |
| Diffraction of light | 16 | 12 | 4 |
| Polarization of light | 16 | 12 | 4 |
| * + - Op-Amp inverting amplifier
 | 1 | - | 1 |
| * + - Measurement of the curvature of the convex surface of a lens using Newton’s Rings.
 | 1 | - | 1 |
| * + - Measurement of the width of narrow slit using Single and double slit diffraction.
 | 1 | - | 1 |
| * + - Measurement of the wavelength of the line spectrum of a light source using a Diffraction Grating.
 | 1 | - | 1 |
| * + - Determination of the specific rotation of a sugar solution using the Polarimeter.
 | 1 | - | 1 |
| **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  | 13th week |
| -Assessment 2; Project Assignment  | weekly |
| -Assessment 3; Presentations  |  |
| -Assessment 3; Midterm Exam | 10th week |
| -Assessment 4; Final Exam | End of Term |
| * **Weighting of Assessments**
 |
| -Mid-Term Examination | 32% |
| -Final-term Examination  | 56% |
| -Project |  |
| -Class Test | 12% |
| -Presentation |  |
| -Total | 100% |
| **6. List of References** |
| * + **Course Notes**

 Notes by lecturers* + **Essential Books (Text Books)**
1. “Physical Optics,” Engineering Physics Dept., Cairo University, Egypt, 2007.
2. “Experimental Physics Lab for First Year,” Engineering Physics Dept., Cairo University, Egypt, 2007.
3. “Solved Problems on Physical Optics for Engineering Students”, Engineering Physics Dept., Cairo University, Egypt, 2007.
	* **Recommended Books**
	* **Web Sites**

 http://www.physicsdaily.com/physics/ |
| **7. Facilities Required for Teaching and Learning** |
| 1. Data Show and white board
2. Traditional methods
3. Well-equipped labs with sufficient number of calibrated experiments with respect to number of students
 |
| **Course Coordinator:** | **Prof.Dr/ Abd-El-Rahman Moghazy** |
| **Head of Department:**  | **Prof.Dr/ El-Sayed Mahmoud El-Banna** |

