

**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 Engineering | | | | | | | | | | |
| **Department offering the program:** | | | | | | | Mining, Petroleum, and Metallurgy | | | | | | | | | | |
| **Department offering the course:** | | | | | | | Mining, Petroleum, and Metallurgy | | | | | | | | | | |
| **Academic Level:** | | | | | | | 3 rd year Metallurgy | | | | | | | | | | |
| **Date** | | | | | | | 2014 | | | | | | | | | | |
| **Semester (based on final exam timing)** | | | | | | | t Fall Spring | | | | | | | | | | |
| **A- Basic Information** | | | | | | | | | | | | | | | | | |
| **1. Title:** | Mineral Processing | | | | | | | | | **Code:** | | | MIN 303 | | | | |
| **2. Units/Credit hours per week:** | | Lectures | | | 4 | | | Tutorial | | | 1 | Practical | | **-** | | Total | 5 |
| **B- Professional Information** | | | | | | | | | | | | | | | | | |
| **1. Course description:** | | | | .  An introduction to ore deposits, minerals, processing methods and equipment, particularly those utilized in the mining industry. Topics include material balances, size analysis, crushing, grinding, classification, flotation, magnetic, gravity, electrostatic separations and dewatering. Applications to concentration, recycling industries are discussed. A major design problem is given to cover process design and material balances. | | | | | | | | | | | | | |
| **2. Intended Learning Outcomes of Course (ILOs):** | | | | **a) Knowledge and Understanding** | | | | | | | | | | | | | |
| 1- Apply knowledge of mathematics, science, and engineering skills for mineral, preparation processing and environmental management. | | | | | | | | | | | | | |
| 2- Principles and applications of mineral processing techniques for design of mineral up-grading flow sheets | | | | | | | | | | | | | |
| **b) Intellectual Skills** | | | | | | | | | | | | | |
| 3- Assess and evaluate the characteristics and performance of components, systems and processes. | | | | | | | | | | | | | |
| 4- Optimizesation of the mining process and reliability | | | | | | | | | | | | | |
| **c) Professional and Practical Skills** | | | | | | | | | | | | | |
| 5- Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services. | | | | | | | | | | | | | |
| 6- Supervise the operations of extraction, processing and sometimes the primary refinement, of the raw material. | | | | | | | | | | | | | |
| **d) General and Transferable Skills** | | | | | | | | | | | | | |
| 7- Effectively manage tasks, time, and resources. | | | | | | | | | | | | | |
|  | | | | 8- Refer to relevant literatures. | | | | | | | | | | | | | |
| **3. Contents** | | | | | | | | | | | | | | | | | |
| **Topic** | | | | | | **Total hours** | | | **Lectures hours** | | | | | | **Tutorial/ Practical hours** | | |
| * Introduction | | | | | | 4 | | | 4 | | | | | |  | | |
| * particle size analysis ,sieve analysis | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * particle size analysis ,sub-sieve analysis | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Primary Crushers | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Secondary crushers | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Grinding mills | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Industrial screening | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Classification – hydraulic, mechanical classifiers | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Hydrocyclone | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Gravity separation | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Heavy media separation | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Magnetic separation | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * High-tension and electrostatic separation | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Theory of Froth flotation | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Flotation machines and circuits | | | | | | 5 | | | 4 | | | | | | 1 | | |
| * Case studies | | | | | | 5 | | | 4 | | | | | | 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; Assignment | | | | | | | | | Bi-weekly | | | | | | | | |
| -Assessment 2; Midterm Exam | | | | | | | | | Eighth week | | | | | | | | |
| -Assessment 3; Final Exam | | | | | | | | | Fifteenth week | | | | | | | | |
| * **Weighting of Assessments** | | | | | | | | | | | | | | | | | |
| -Mid-Term Examination | | | | | | | | | 20 points | | | | | | | | |
| - Problems and assignments | | | | | | | | | 25 points | | | | | | | | |
| -Final-term Examination | | | | | | | | | 80 points | | | | | | | | |
| -Total | | | | | | | | | 125 points | | | | | | | | |
| **6. List of References** | | | | | | | | | | | | | | | | | |
| B.A.Wills "Mineral Processing Technology ", Jhon Wiley and sons, 2007. | | | | | | | | | | | | | | | | | |
| Principles of Mineral Processing   |  |  | | --- | --- | |  | Editors: Maurice C. Fuerstenau, Kenneth N. Han Published by Society for Mining, Metallurgy, and Exploration - 2003 | | | | | | | | | | | | | | | | | | |
| . SME Mineral Processing Handbook (Order No. 4436))Hardcover – February, 1986  by [Norman L. Weiss](http://www.amazon.com/s/ref=dp_byline_sr_book_1?ie=UTF8&field-author=Norman+L.+Weiss&search-alias=books&text=Norman+L.+Weiss&sort=relevancerank) (Editor) | | | | | | | | | | | | | | | | | |
| |  | | --- | | [SME PDF] Mineral Processing Plant Design, Practice, and Control Proceedings, Volumes 1-2 Edited by: Mular, Andrew L.; Halbe, Doug N.; Barratt, Derek J. © 2002 Society for Mining, Metallurgy, and Exploration (SME) |   . | | | | | | | | | | | | | | | | | |
| D.L.Khoury, Coal Cleaning Technology, Noyes Data Corporation, 1981. | | | | | | | | | | | | | | | | | |
| . A.J .Lynch, N.W.Johnson, E.V.Manlapig, C.G.Thorne, Mineral and Coal Flotation Circuits, 1981. | | | | | | | | | | | | | | | | | |
| 7. Facilities Required for Teaching and Learning | | | | | | | | | | | | | | | | | |
| Mineral Processing Lab  Computer, Data show. | | | | | | | | | | | | | | | | | |
| Course Coordinator: | | | Prof. Dr. Ahmed Abdallah Sadeek Seifelnassr | | | | | | | | | | | | | | |
| Head of Department: | | | Prof. Dr. E.M. Elbanna | | | | | | | | | | | | | | |

