

**Department:** Mining Engineering

**Division:** Mining Exploitation

**Level and Major:** MSc, Mining Exploitation

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**Course Title:** Mine Closure and Reclamation

**Number of Credits:** 2

**Lecturer:** Dr. Morteza Gholi Osanloo

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### **Course Goals and Objectives**

Gain skills in mine planners and designers to prepare mined lands for reuse.

### **Course Topics**

- Collection and Analysis of Closure Data
- Guidelines for preparing mine Closure Plans
- Eventual mined land use: [1] Return to the original conditions (before mining start- native uses), [2] Agricultural uses, [3] Forestry uses, [4] Lake, Amenity and recreation activities
- Monitoring and Management of mines reclamation plan
- Mine waste characteristics and environmental problems: (1) Origin and range of mine wastes, (2) Physical, chemical, and biological characteristics
- Duration of mine reclamation plan implementation
- Integrated, Interactive of surface mining, reclamation, and mines land use planning and design
- Mine wastes reclamation plan
- Reclamation of cyanides wastes of gold- silver mines
- Definition of Mine Closure
- Mine Reclamation
- Natural and Cultural factors affecting mine reclamation plan: (1) Natural factors, (2) Cultural factors
- Reclamation of uranium, phosphate and potash mines
- Mine Closure
- Definition: Reclamation, Restoration, Rehabilitation, Remediation
- Mining and Environmental Impacts : (1) air pollution, (2) water pollution(3) land pollution, (4) noise pollution
- Initial consideration of mine reclamation strategy (constraints to reclamation plan and plant growth): (1) Climate, (2) Physical factors, (3) Chemical factors
- Mine tailings reclamation plan

## Reading Resources

- Botin, J.A. sustainable management of mining operation, published by SME, USA, (2009), 381 p
- Kennedy A.B. "Surface mining" 2<sup>nd</sup> edition, published by SME, USA -1990- p 485-495 and 883-889
- Bhattacharya, J. "Principle of mine planning" allied publication, New Delhi, 2003, p 295-312
- Osanloo, M, Mine reclamation, 2<sup>nd</sup> edition, Amirkabir University of Technology, Tehran, (2008), 228 p
- Williamson N.A and Johnson M.S, "Mine Wastes Reclamation", Mining Journal Books, 1982-103P
- Bell FG et al, Mining and its impact on the environment, Taylor and Francis, London, (2006) 547 p
- Fung, R., Surface mining technology, Engineering and Environmental aspects, Publisher: NDC-New Jersey-USA, (1981), 380 pages
- Lottermoser, B.G, Mine Wastes: Characterization, treatment, environmental impact, Springer 2<sup>nd</sup> edition, (2007), 300 p
- Coppin. N.J and Bradshaw A.D, "Quarry Reclamation" mining journal books -1982- 112P
- Vasu de van R et al., Sustainable mining practices, Taylor and Francis Group, London, (2005), 300 p
- W. Hustrulid; and Kuchta M., Open-pit mine planning and design; 3<sup>rd</sup> Ed., Taylor and Francis Group, 2013, 1004 pages
- Peter, Darling; SME mining engineering handbook Vol. 1, 2; SME 3rd edition -2011- 1984 pages
- Nathanal, C.P., and Bardos, R.P., Reclamation of contaminated land, John Wiley and Sons, (2004), 238 pages
- Land Reclamation in Ecological Fragile Areas: Proceedings of the 2<sup>nd</sup> International Symposium on Land Reclamation and Ecological Restoration (LRER 2017), October 20-23, 2017, Beijing, PR China