

Course Syllabi

1. INGE-00027 EXTRACTIVE METALURGY

2. Instructor:

- Sonia Margoth Astudillo Ochoa

3. Bibliography

- NOTAS DE CLASE DE METALURGIA

EXTRACTIVA/https://minas.medellin.unal.edu.co/images/Centro-Editorial/Metalurgia_extractiva.pdf, OSCAR JAIME RESTREPO BAENA , 2019

- PEQUEÑA MINERIA TECNICAS Y PROCESOS, MICHAEL PRIESTER, THOMAS HENTSCHEL, BERND BENTHIN. , 1992
- GEOLOGIA DEL ECUADOR, EUGENIO NUÑEZ, 2003

4. Specific Course Information

- a. The subject of Extractive Metallurgy corresponds to the area of professional training the same one that is based on providing the student with basic knowledge and analytical processes to extract metals from their minerals in order to separate species of interest from those of valueless. Therefore it is important that the study of this subject can contribute according to the graduation profile of the chemical engineering career in the following aspects: 6. Controlling experiments and processes of the field of the Chemical Engineering, considering transport phenomena, unitary operations, chemical processes, and operational research, to obtain relevant information and meet previously defined objectives. 7. Apply the basic foundations of training research, at the exploratory and diagnostic level, in an appropriate way, for the development of experiments, for the search, selection and evaluation of information, preparation of bibliographical essays and academic articles and for the communication of h 9. To implement technologies related to the physical and chemical transformation of materials, effectively, incorporating technological improvements or innovations. 11. To evaluate and develop industrial projects with technical and economic criteria, to estimate their feasibility. 12. To manage laboratories of physical and chemical analysis with scientific-technical rigor and safety, to provide reliable analytical results. 13. To act with respect and commitment to the environment, applying ge practices 14. To act with professional ethics, considering the social and economic impact of their professional practice, in the regulatory areas related to quality, health and safety and the environment.

b. Prerequisites:

- INDU-00034 Applied mining
- INDU-00046 Analytical chemistry soils
- SVCS-00036 Community service
- INDU-00037 Ope III wetting-drying
- INDU-00036 Op III ionic exchange

5. Learning Objectives of the Course

- a. General objective: The general objective of the subject is to get the student to acquire and assimilate the necessary foundation to understand the principles for the extraction of metals from their minerals, refining them and preparing them for use, all this based on conventional classical methods and modern instrumental methods. It is also important that the student develop analysis techniques to verify whether they comply with the theoretical aspects indicated in each and every one of them. stintas stages of the extraction process, as well as the statistical treatment of the experimental results obtained

and their reliability; in order to understand, discuss and interpret the importance of the metallurgy sector. - To evaluate the different operations applied in Extractive Metallurgy necessary to treat a mineral according to its characteristics, in order to obtain the metal of interest, also allowing to develop skills and skills to the student thus ómo acquire adequate knowledge for the treatment of materials related to the area of metals and industrial minerals. - Inculcate the habit of the permanent study of the subject and encourage the search for new knowledge and analytical techniques that are less polluting in order to guarantee the health and safety of the personnel and the environment. - Evaluate in an efficient, economic and sustainable way the process of extraction of metals, minimizing the environmental impact in order to to adapt these resources for the benefit of the development and well-being of humanity.

b. Learning Outcomes

1. Know the basic metallurgical techniques for obtaining metals from their minerals.
2. It performs on a laboratory scale, metal extraction processes applying good laboratory practices, to provide reliable analytical results and evaluate the environmental implications of metallurgical operations.
3. It knows the fundamentals of metal mining processes and applies the knowledge acquired to practical cases.

6. Course Topics

1. Extractive metallurgy.
2. Thermodynamics and metallurgical kinetics
3. Prior operations and metallurgical processes
4. Wet metallurgy. teaching. electrometallurgia. metal refining process
5. Environmental impacts on extractive metallurgy