NATIONAL UNIVERSITY OF ENGINEERING

COLLEGE OF ENVIRONMENTAL ENGINEERING

HYGIENE AND INDUSTRIAL SAFETY ENGINEERING PROGRAM

SE211 – INTEGRAL SAFETY IN EXTRACTIVE ACTIVITIES

I. GENERAL INFORMATION

CODE	**:**	SE211 – Integral Security in Extractive Activities
SEMESTER	**:**	-
CREDITS	**:**	03
HOURS PER WEEK	**:**	04 (Theory – Practice)
PREREQUISITES	**:**	SE102 – Safety Engineering II
CONDITION	**:**	Elective

II. COURSE DESCRIPTION

The course prepares the student in the practical application of the knowledge acquired in industrial safety and hygiene directed to mining, to prevent occupational accidents and diseases, for which the subject comprises: Historical Background. Current legislation. Management of the Miners. Management of Mine Safety and Hygiene, Exploitation Methods, Work Environments, Environmental Agents, Physiological Effects and Professional Diseases, Mining Hygiene, Methods, Anticipation, Recognition, Evaluation, Control. Management of Safety in Mining Operations. Preparation and Answers for Emergencies, Annual Mine Safety and Hygiene Program.

III. COURSE OUTCOMES

At the end of the course the student will:

- Build and organize the theoretical knowledge acquired for the practical application in mining safety and hygiene, so that the student will be capable of preventing work accidents and occupational diseases.
- Organize the knowledge and skills in Mining Safety and Hygiene to be competitive and show leadership.
- Project and develop the capacity to identify, analyze, evaluate and / or measure the magnitude of occupational risks.
- Develop the ability to promote, prevent occupational hazards and the ability to select and apply control methods.
- Formulate the Mine Safety and Hygiene Programs, within the framework of the Occupational Health and Safety Law.
- Manage the Annual Programs in Mine Safety and Hygiene.

IV. LEARNING UNITS

1. EXTRACTIVE ACTIVITIES. SECURITY AND MINERAL HYGIENE. HISTORICAL BACKGROUND

Extractive activities. Introduction Importance of Mining Safety and Hygiene. Historical Background of Mine Safety and Hygiene. Occupational Health and Safety Regulations. Work environment in mining works. Exploitation method, technology and mining plans.

2. MINING HYGIENE

Mining dust Sources of generation in mining operations. Environmental agents: chemical, physical, biological. Sources of generation in the different mining operations. Ergonomic and psychosocial factors. Physiological Effects of the agents and the Professional Diseases. Mining Hygiene. Definition, Methods: Anticipation, recognition, evaluation, control. Concept. Goals. Technique. Rules. Occupational exposure Maximum allowable limit.

3. MINING SECURITY

Prevention of accident risks. Cause of accidents. Ground Control Mining operations Detection and elimination techniques. Inspection, importance, classes, technique. Research of work accidents. Records. Accident report. Accident statistics. Accident costs. Preparation and response for mine emergencies.

4. SECURITY IN AUXILIARY MINING SERVICES AND RELATED ACTIVITIES

Management of services and related activities: Importance, objectives, activities and risk prevention. Fire prevention and control. Control of hazardous materials.

5. PREPARATION AND RESPONSE FOR EMERGENCIES IN MINING

Preparation and response for emergencies in mining activity. Mining Emergency Plan.

6. ANNUAL SECURITY AND MINING HYGIENE PROGRAM

Mine hygiene and safety management: Leadership and commitment, policy and Annual Occupational Safety and Health Program.

V. LABORATORIES AND PRACTICAL EXPERIENCES

Video projection about mining. Forming teams and presenting their monographic works on mining. Reading of mining plans. Problems and discussion of cases of occupational diseases. Problems, solution and discussion. Video projection on mining safety and hygiene. Solve problems of accidents and discussion in the classroom. Presentation and exposition of the Monographic Works.

VI. METHODOLOGY

In the theory sessions, the teacher presents the concepts, definitions and the theoretical foundations.
In the practice sessions, the students work as a team, where the teacher is the organizer, mediator and facilitator in the solution of the presented problems and / or cases.

VII. EVALUATION FORMULA

The learning will be evaluated through the "G" system.

- Partial Exam: Weight 1
- Final Exam: Weight 1
- Practices Average: Weight 1.

Calculation of the Final Average:

$$FA = \frac{PE + FE + PA}{3}$$

PE: Partial Exam; FE: Final Exam, PA: Practices Average

For the Practices Average, during the semester four qualified practices and the practice with lowest grades is eliminated. The average is calculated with the remaining three practices.

$$PA = \frac{P1 + P2 + P3}{3}$$

VIII. BIBLIOGRAPHY

- Energy and Mines, Occupational Health and Safety Regulations Mining, D.S. No. 024-2016-Em. Lima Peru.

- Hans Hamrin. Encyclopedia of Safety and Health at Work-Oit.Técnicas Minería Subterránea, Madrid 2001.