



NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF GEOLOGICAL, MINING AND METALLURGICAL
ENGINEERING

MINING ENGINEERING PROGRAM

GM942 – CONTROL OF MINING OPERATIONS

I. GENERAL INFORMATION

CODE	: GM942 Control of Mining Operations
SEMESTER	: 9
CREDITS	: 3
HOURS PER WEEK	: 5 (Theory–Practice)
PREREQUISITES	: MI872 Surface Mining Exploitation Methods
CONDITION	: Compulsory
DEPARTMENT	: Mining Engineering

II. COURSE DESCRIPTION

The course starts with the revision of concepts of work, production and productivity. The research scientific method is applied to study the mining production process. Schemes and diagrams are elaborated and analyzed in order to identify variables that produce process deviations and propose corrective and improving solutions for increasing quality and decreasing costs and time. Work is measured and production ratios are calculated. Finally, the acquired knowledge and management techniques will be applied for the monitoring and control of an actual mining production process.

III. COURSE OUTCOMES

At the end of the course, students:

1. Identify the main resources of a project, manage and assign them to fulfill project schedules and budgets.
2. Identify and sequence all the required activities in a project and elaborate management plans and schedules.
3. Manage the times of the project to fulfill schedules, including incidentals and unexpected situations.
4. Apply quality control methods to assure the final product meets required specifications
5. Elaborate inventory control programs assuring the timely availability of required resources.
6. Formulate preventive and corrective maintenance plans of equipment and instruments.

IV. LEARNING UNITS

1. INTRODUCTION

Styles and stages of production / Identifying relevant parameters in operations control / Resources management (human, machines and materials) / Operative cycle and relationship with work environment / Concepts of administration and productive process / Control parameters / Input – Process – Output diagrams / Operations control.

2. TIME MANAGEMENT

Identify correction actions to possible deviations / Process sequence / Time control in unexpected situations / Time management / Definition and activities sequence / Clearances / Resources assignment / Tools and techniques for operations control / Chronogram management plan / Project management plan / Diagramming method by precedence.

3. FINANCIAL MANAGEMENT

Administration and identification of difficult areas / Possible deviations correction / Techniques to measure and registry the real progress of activities / Financial comparative analysis between current and estimated progresses / Critical path / Verification techniques / State registry of the project / Direct, variable and total costs / Decreasing and optimization of costs techniques. /

4. QUALITY MANAGEMENT

Application of management techniques and knowledge to produce economically optimal products that meet the needs of the process / Definition and quality control elements / Statistical control of quality / Process diagram / Analysis and improvements / Quality assurance / Problems identification / Improvement goals / Production factors (4M).

5. INVENTORY MANAGEMENT

Mathematical methods / Optimal investment control and planning in stocking and materials renovation process / Logistics / Control and planning / Inventory control theory / Sources / Inventory models.

6. PRODUCTIVE MAINTENANCE

Six biggest loses elimination in order to reach a Just in Time Production / Systemic disposal of waste / Definitions / Dead time / Low performance working in equipment / Maintenance improvement activities / Stages of implementation / Maintenance management evolution.

V. PRACTICAL EXPERIENCES

1. Session 1: Time management.
2. Session 2: Finance management.
3. Session 3: Quality management.
4. Session 4: Inventory management.
5. Session 5: Productive maintenance.
6. Technical visits: Underground and surface mines.

VI. METHODOLOGY

Active teaching is applied to promote lectures, student participation, workshops and team work. There are 5 practice sessions, which are focused on the development of learned topics. Technical visits allow to identify the different activities in underground and surface mining exploitation methods.

VII. GRADING FORMULA

The Final Grade PF is calculated as follow:

$$PF = (EP + EF + PP) / 3$$

EP: Mid-term Exam EF: Final Exam
PP: Average of 5 Practical Works

VIII. BIBLIOGRAPHY

1. EPPEN GOULD.
Research Operations in Administrative Sciences.
2. HIEZER RENDER.
Production and Operations Direction.