RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Mining Engineering, VI-Semester

MI6001 - Underground Metal Mining

UNIT 1: General
Status and scope of Underground metal mining methods; Definitions of important terms used in underground metal mining methods. Classification of mining methods; Factors affecting the choice of mining methods

UNIT 2: Development
Mode of access; Variables affecting the choice of mode of access; Crosscuts, Levels, Raises, Winzes, Ore passes; Their method of drivages with the description of various unit operations; Introduction to Raise boring and introduction to tunnel boring .

UNIT 3: Stoping Methods-I
Overhand, Underhand and Breast stoping methods; Open stoping; Vertical Crater Retreat method; Sub level stoping Room and Pillar method., Resuing method.

UNIT 4: Stoping Methods-II
Shrinkage stoping; Cut and fill stoping, Introduction to Square set stoping, Sub level caving, Block caving, Top slicing.

UNIT 5: Support Systems
Pillars; Back fill, Cable bolting, Steel Rock bolting, Grouting, Shotcreting etc.,Code of timbering rules.

Reference Books:
1. Elements of Mining Tech. Vol II by D. J. Deshmukh
2. S M E Handbook
3. Underground mining methods, Hustrulid
4. Introduction to Mining, H. L. Hartman

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Credit Based Grading System

Mining Engineering, VI-Semester

MI- 6002 Mining Environment - II

UNIT 1: VENTILATION SYSTEMS AND PLANNING
Calculation of pressure and quantity requirements, network problems, Hardy-Cross method, Ventilation planning and economic analysis, central and boundary ventilation, ascensional and descensional ventilation, antitropal, homotropal ventilation.

UNIT 2: MECHANICAL VENTILATION - I
Theory of mine fans, Types of mine fans, their characteristics & suitability, Process for selection of mine fans

UNIT 3: MECHANICAL VENTILATION - II
Auxiliary and booster fans, series and parallel operation of fans, fan drift and evasee, forcing and exhaust ventilation, fan reversal, ventilation in long headings.

UNIT 4: VENTILATION SURVEY
Object of ventilation survey, instruments for the measurement of pressure, velocity, and quantity of air.

UNIT 5: MINE DUST
Classification, physiological effects, measurement of dust concentration, dynamics of small particles, sampling of air borne dust, prevention and suppression of dust

Reference Books:
1. Mine Environment - G.B. Mishra
2. Elements of Mining Technology, Vol.2, D. J. Deshmukh
3. Underground Mine Environment, M. Mcpherson
4. Subsurface Mine Ventilation, H.L. Hartman

List of Experiments:
1. Study of installation of axial flow fan.
2. Study of installation of centrifugal flow fan.
3. Study of installation and positioning of booster fan.
4. Study of characteristic curve of different fans and their comparison
5. Study of principal and working of vane anemometer
6. Study of principal and working of velometer.
7. Study of principal and working of pitot tube.
8. Study of central and boundary ventilation system.
9. Study of gravimetric dust sampler
10. Study of thermal precipitator dust sampler

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Credit Based Grading System

Mining Engineering, VI-Semester

MI6003- Mining Machinery- II

UNIT 1. Aerial ropeways
Different types, their constructions & installation, operation & maintenance, design calculation, their layout including rope-tensioning arrangements.

UNIT 2. Conveyors - I
Different types of belt conveyors, their construction, installation, maintenance & design.

UNIT 3. Conveyor - II
Shaker conveyor, scraper chain conveyor and armored chain conveyor, their installation & construction maintenance. Safety Devices; Pit top and pit bottom arrangements.

UNIT 4. Skip & Koepe Winding
Skip types & construction, pit top & pit bottom arrangements, advantages and disadvantages, Types of Koepe Winder, Koepe wheel, Floating platforms, Two winders working in the same shaft, Winding with side by side and up and down sheaves, advantages and disadvantages. Multi-rope winding. Calculation of H.P.

UNIT 5. HYDRAULIC TRANSMISSIONS
Fundamental of hydrostatic compression, hydraulic fluids, hydraulic pumps, motors, cylinders and accumulators, different types of valves, hydraulic coupling and torque converters, Application in mines, Advantages of hydraulic transmission.

Reference Books:
1. Elements of Mining Tech. Vol I & Vol III by D. J. Deshmukh
2. Mining Machinery By S. C. Walker
3. Coal Mining Practice By Stathum

List of Experiments:

1. Study of Monocable aerial Ropeway.
2. Study of Bicable aerial Ropeway.
3. Study of Loop take-up and tensioning arrangement of a belt conveyor.
4. Study of pit top and pit bottom arrangements for a belt conveyor.
5. Study of Belt Conveyor
6. Study of an Armoured face Conveyor.
7. Study of Various Koepe Arrangements
8. Study of various types of skips.
9. Study of pit top and pit bottom arrangements for a Skip.
10. Study of hydraulic Couplings and Torque Converters.

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Credit Based Grading System

Mining Engineering, VI-Semester

MI6004 - Pollution Control Engineering

UNIT 1: ENVIRONMENTAL POLLUTION
Introduction and classification of environmental pollution, ecological conservation. Salient features of the environmental laws in India and Occupational disease. Environmental Impact Assessment, Environmental Management Plan, Environmental Audit.

UNIT 2: AIR POLLUTION
Air pollution due to various gases and suspended particulate materials, causes, consequences, preventive measures, dust measuring equipment.

UNIT 3: NOISE POLLUTION
Pollution due to noise and its consequences, noise produced by different machinery, control and safety, measurement of noise levels.

UNIT 4: WATER POLLUTION
Water pollution, its causes and preventive measures, acid-mine drainage, water pollution in mines and mineral beneficiation plants, water purification schemes in brief.

UNIT 5: LAND POLLUTION
Land pollution and land reclamation, land reclamation techniques, Physical and Biological reclamation, Mine Closure Plan

Reference Books:
1. Air & Water Acts
2. Forest Conservation acts
3. Legislation in Indian Mines - A Critical appraisal by Rakesh and Prasad
4. Environmental Impact of Mining By Down and Stokes

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Credit Based Grading System

Mining Engineering, VI-Semester

Elective-II MI- 6005 (1) Mining Legislation & Safety-II

01. Principal Provisions of Mines & Minerals (Regulation & Development) Act - 1957

02. Coal Mines Conservation & Development Act. - 1960

03. Mineral Concession Rules, Indian Electricity Rules related to mining activity.

04. Byelaws & D.G.M.S. Circulars.

05. Mines Rescue Rules - 1985

06.Mine Accident, their classification and analysis, Causes & preventive measures, Cost of accident, Preparation of Accident report, Court of Enquiry.

07. Safety Campaign, Causes of major mining accidents which occurred in India & Suggested remedial measures. National Safety Conferences.

Reference Books:

1. Legislation in Indian Mines (A critical Appraisal) Vol. I & II, S. D. Prasad & Prof. Rakesh
2. Coal Mines Conservation & Development Act Mines & Minerals (Development and Regulation) Act Vocational Training Rules
3. Mine Accidents : B. K. Kejariwal
4. Mines Rescue Rules
5. Indian Electricity Rules
6. Mineral Concession Rules.
7. D.G.M.S. Circulars and Bylaws

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA BHOPAL

Credit Based Grading System

Mining Engineering, VI-Semester

Elective-II MI-6005 (II) IPR (Intellectual Property Rights)

Course Objective

Acquaint the students with the basic concepts of Intellectual Property Rights; and sensitize the students with the emerging issues in IPR and the rationale for the protection of IPR.

UNIT I Introduction

Introduction and Justifications of IPR, Nature of IP, Major forms of IP- *Copyright, Patent, Trade Marks Designs, Geographic indication, layout design of Semi conductors, Plant varieties, Concept & Meaning of Intellectual Property.*

Major international documents relating to the protection of IP - *Berne Convention, Paris Convention, TRIPS*. The World Intellectual Property Organization (WIPO).

UNIT II Copyright

Meaning and historical development of copyright , Subject matter , Ownership of copyright, Term of copyright, Rights of owner, Economic Rights, Moral Rights. Assignment and licence of rights, Infringement of copyright, Exceptions of infringement, Remedies, *Civil, Criminal, Administrative*, Registration Procedure.

UNIT III Patents

Meaning and historical development,. Criteria for obtaining patents, Non patentable inventions, Procedure for registration, Term of patent, Rights of patentee, Compulsory licence, Revocation, Infringement of patents, Exceptions to infringement, Remedies, Patent office and Appellate Board.

UNIT IV – Trade Marks, Designs & GI

Trade Marks: Functions of marks, Procedure for registration, Rights of holder, Assignment and licensing of marks, Infringement, Trade Marks Registry and Appellate Board.

Designs: Meaning and evolution of design protection, Registration, Term of protection, Rights of holder, unregistered designs.

Geographical Indication: Meaning and evolution of GI, Difference between GI and Trade Marks, Registration, Rights, Authorised user.

UNIT V Contemporary Issues & Enforcement of IPR

IPR & sustainable development, The Impact of Internet on IPR. IPR Issues in biotechnology, E-Commerce and IPR issues, Licensing and enforcing IPR, Case studies in IPR

Course Outcome:

1. Students will be able to understand Primary forms of IPR
2. Students will be able to asses and critique some basic theoretical justification for major forms of IP Protection
3. Students will be able to compare and contrast the different forms of IPR in terms of key differences and similarities.
4. Students will be able understand the registration procedures related to IPR.
5. Students will be exposed to contemporary issues and enforcement policies in IPR.

References:

1. P. Narayanan, Intellectual Property Law, Eastern Law House

2. . Neeraj Pandey and Khushdeep[Dharni, Intellectual Property Rights, PHI, 2014

3. N.S Gopalakrishnan and T.G. Agitha, Principles of Intellectual Property, Eastern Book Co. Lucknow, 2009.

4. Anand Padmanabhan, Enforcement of Intellectual Property, Lexis Nexis Butterworths, Nagpur, 2012.

5. Managing Intellectual Property The Strategic Imperative, Vinod V. Sople, PHI.

6. Prabuddha Ganguli, " Intellectual Property Rights" Mcgraw Hill Education, 2016.

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Credit Based Grading System

Mining Engineering, VI-Semester

MI-6007 Creativity and Entrepreneurship Development

Course Objective:

- Understand and use tools for generating entrepreneurial ideas and problem solving.
- Understand and use tools for the selection of ideas.
- Understand and gain the skills that are needed to implement ideas in today's society
- Understand Entrepreneurship's part in process that includes idea generation and implementation.
- Understand the concept of Entrepreneurship and its place in today's society

Course Outcomes:

- Recognize an opportunity for a user group and frame an appropriate design challenge that addresses the need for the user.
- Practice observation, interview and empathy skills to evolve a thorough understanding of the needs of the user.
- Share and integrate team leanings.
- Generate, develop and describe creative ideas that address the design challenge.

Syllabus:

1. The concept of Entrepreneurship, its history and its place in society.
2. The concept of Entrepreneurship and its relation to concept of innovation.
3. Creative processes for idea generation and problem solving.
4. Business plan.
5. Role of creativity, innovation and business research.
6. Entrepreneurship opportunities in contemporary business environment.

Reference Books :

1. Dollinger M.J. "Entrepreneurship strategies and resources," 3rd edition Pearson Education New Delhi.
2. Panda, Shiba charan "Entrepreneurship development", Anmol publication New Delhi.
3. Richard Blundel & Nigel locket, "Exploring Entrepreneurship : practices & perspectives Oxford.
4. Charles E. Banford & Garry D. Bruton, "Entrepreneurship – A small business Approach, Mcgrawhill Education.
5. P. Narayana Reddy, "Entrepreneurship" : Text and cases, Cengage learning
6. Rajeev Roy, "Entrepreneurship" Oxford.