



Department of Studies in Mineral Processing

Programme Outcomes (POs):

At the end of the programme, students will be able to:

PO1:	Identify the minerals and their end applications in industry
PO2:	Formulate a separation system, or process to meet the desired needs of Metallurgical engineers within economic, Environmental and social constraints
PO3:	Graduates will demonstrate separation of Minerals, sizing, classification and separation of valuable minerals from respective ores by various mineral processing methods etc.
PO4:	To collaborate with multidisciplinary sciences and its application to mineral engineering
PO5:	Identify and formulate the scheme to solve technical problems in mineral based plants
PO6:	Understanding of professional responsibility and skill.
PO7:	Recognize the need of conservation of reserves and development of safe technology in global environment.
PO8:	Ability to use the techniques, skills, and modern engineering tools necessary for mineral engineering practices.
PO9:	To understand engineering and management principles and its application through most rational approaches for the extraction of minerals.

Course Outcomes (COs):

I Semester

Title of the Course with Code: MPHC1.1 Mineralogy

After completion of this course, students will be able to

CO	Statement
CO1	To identify and differentiate the minerals based on appearance and their properties.
CO2	Based on the properties able to judge the separation of minerals from one another
CO3	Appreciate the mineral property by identifying its application

Title of the Course with Code: MPHC 1.2: Petrology and Elements of Mining

After completion of this course, students will be able to

CO	Statement
CO1	To identify and differentiate valuable rock or ore from that of less worthy associated rocky material.
CO2	The knowledge of the properties and origin of rock may be used to device the ways and means of separating them from one another.
CO3	Student is able to know low cost and easy method of removing the material from earth crust and procure it for further processing and utilization.

Title of the Course with Code: MPHC 1.3: Elements of Mechanical Engineering

After completion of this course, students will be able to

CO	Statement
CO1	Identify the basic mechanical parts and assemblies
CO2	Appreciate the electrical circuits for control of mineral processing plants
CO3	Identify and aware about electrical hazards and safety measures

Title of the Course with Code: MPSC 1.4: Elements of Electrical Engineering

After completion of this course, students will be able to

CO	Statement
CO1	Identify the basic electrical parts and assemblies
CO2	Appreciate the electrical circuits for control of mineral processing plants
CO3	Identify and aware about electrical hazards and safety measures

Title of the Course with Code: MPHC 1.3: Applied Mathematics and Applied Statistics

After completion of this course, students will be able to

CO	Statement
CO1	Student is able to design the experiments and develop statistical models for solving mineral processing problems
CO2	Formulate the laboratory experiments with minimum trials
CO3	Identify the key variables of the experiments.

II Semester

Title of the Course with Code: MPHC 2.1 : Ore Geology

After completion of this course students will be able to

CO	Statement
CO1	Students will become familiar with various geological processes responsible for formation of ore and about textures and structures present in the ore.
CO2	students can device the best way of separation of minerals with the knowledge of texture and structure

Title of the Course with Code: MPHC 2.2 : Assaying

After completion of this course, students will be able to

CO	Statement
CO1	Perform the Chemical analysis of the ore sample
CO2	Do the characterization of the products obtained by mineral processing operations
CO3	Estimate the errors in results and quantify the results with standards

Title of the Course with Code: MPHC 2.3: Mineral Processing 1

After completion of this course, students will be able to

CO	Statement
CO1	Perform the sampling of ore for various treatments
CO2	Demonstrate the crushing operation and produce products
CO3	Identify the various parts of crushers and grinding mills
CO4	Perform the sieve analysis of feed and products of any equipments used in mineral industries
CO5	Draw the separation curves and able to infer the results

Title of the Course with Code: MPSC 2.4: Testing of Materials and Transport Phenomenon

After completion of this course, students will be able to

CO	Statement
CO1	Able to perform the Tensile , hardness and wear tastings on metallic materials
CO2	Able to perform Non Destructive tests
CO3	Solve the problems related to quantum of energy involved in transport of solids and fluids.

Title of the Course with Code: MPSC 2.5: Computer Basics and Programming in C and C++

After completion of this course, students will be able to

CO	Statement
CO1	Perform the computer programming for specific objectives for solving mineral-based problems using computer programming using C and C++ Language.
CO2	Design the algorithm for specific problems

III Semester

Title of the Course with Code: MPHC 3.1: Ore Microscopy and Research Methodology

After completion of this course, students will be able to

CO	Statement
CO1	Able to operate the ore microscope and adjust the eyepiece for better visibility of the ore texture.
CO2	Able to identify the minerals and textures and structures present in the ore sample.
CO3	Disseminate the knowledge by reading research article
CO4	Able to draft the research objectives and set the scope of the work

Title of the Course with Code: MPHC 3.2: Mineral Processing II

After completion of this course, students will be able to

CO	Statement
CO1	Differentiate the free settling and hindered settling phenomenon's
CO2	Identify the parts of mineral classifiers
CO3	Demonstrate the gravity separation of minerals.

Title of the Course with Code: MPHC 3.3: Coal Preparation and Fuel Technology

After completion of this course, students will be able to

CO	Statement
CO1	Identify the various types of solid fuels and its applications
CO2	Perform the coal quality analysis like Ash Content, Moisture , Volatile matter , FC
CO3	Perform coal processing using various mineral processing techniques for production of cleaner coal.

Title of the Course with Code: MPHC 3.4: SURFACE CHEMISTRY

After completion of this course, students will be able to

CO	Statement
CO1	Solve the adsorption and related problems
CO2	Perform the Surface tension measurement
CO3	Able to apply and formulate the adsorption experiments.

Title of the Course with Code: MPSC 3.5: Indian Mineral Deposits And Plant Flow Sheets

After completion of this course, students will be able to

CO	Statement
CO1	Discuss the Metallic and Non-metallic Mineral Deposits of India
CO2	Distinguish refractory minerals, Diamond, Beach sands. Minerals used in Glass, Cement and Ceramic industries. Minerals used in fertilizer industry,
CO3	Remember the Oil and Gas, Coal & Lignite deposits of India.

IV Semester

Title of the Course with Code: MPHC 4.1: Mineral Processing- II

After completion of this course, students will be able to

CO	Statement
CO1	List out the flotation reagents and their functions
CO2	Explain the flotation theory for separation of minerals
CO3	Investigate the flotation experiments for recovery of valuable minerals from respective ores
CO4	Appraise the surface phenomenon of minerals for flotation techniques

Title of the Course with Code: MPHC 4.2: Non Ferrous Extractive Metallurgy

After completion of this course, students will be able to

CO	Statement
CO1	Discuss the process and processing methods of lean grade non metallic ores and their extraction principles.
CO2	Apply the reduction and calcinations experiments for recovery of valuable minerals
CO3	Demonstrate the Leaching experiments

Title of the Course with Code: MPHC 4.3: MINERAL PROCESSING – IV

After completion of this course, students will be able to

CO	Statement
CO1	Demonstrate the magnetic separation studies on magnetic minerals
CO2	Design the thickeners for dewatering application
CO3	Discuss the mineral processing plant waste management

Title of the Course with Code: MPSC 4.4: Mineral Processing Plant Design -1

After completion of this course, students will be able to

CO	Statement
CO1	Inspect the ore samples for specific mineral processing applications
CO2	Measure the particle size
CO3	Choose the right crusher and mills for Comminution units

Title of the Course with Code: MPSC 4.5: Process Control and Automation

After completion of this course, students will be able to

CO	Statement
CO1	Use the control and optimization tools available in the industry.
CO2	Analyse the controlling process parameters in mineral industries
CO3	Choose the right feedback control loops for mineral processing plants

Title of the Course with Code: MPHC 5.1: Environmental Management & Mineral Processing Economics

After completion of this course, students will be able to

CO	Statement
CO1	Classify the industrial pollutants and appraise its storage.
CO2	Practice the new conceptual design to control and avoid the pollution caused by mineral industries
CO3	Propose pollution free environment
CO4	Discuss the economics of the mineral values

Title of the Course with Code: MPHC 5.2: AGGLOMERATION AND CEMENT MAKING

After completion of this course, students will be able to

CO	Statement
CO1	perform the pelletisation , Brequetting and sintering of ore samples
CO2	Give inputs for cement making technology for enhancing the product quality
CO3	Discuss the effect of raw material quality in pellet making

Title of the Course with Code: MPHC 5.3: FERROUS EXTRACTIVE METALLURGY

After completion of this course, students will be able to

CO	Statement
CO1	Perform the raw material tests for blast furnace for iron making
CO2	Discuss the consequences of blast furnace design and operations to produce iron
CO3	Propose the solutions for emission free operations

Title of the Course with Code: MPHC 5.3: FERROUS EXTRACTIVE METALLURGY

After completion of this course, students will be able to

CO	Statement
CO1	Perform the raw material tests for blast furnace for iron making

CO2	Discuss the consequences of blast furnace design and operations to produce iron
CO3	Propose the solutions for emission free operations

Title of the Course with Code: MPSC 5.4: Mineral Processing Plant Design –II
After completion of this course, students will be able to

CO	Statement
CO1	To give valuable input for designing of Belt conveyers:
CO2	Design and Select the Stackers and Reclaimers
CO3	Recommend right Slurry transportation Operations
CO4	Appraise the importance of Dust collection systems – Electrostatic system applications.

Title of the Course with Code: MPSC 5.5: Simulation and Modelling
After completion of this course, students will be able to

CO	Statement
CO1	Simulate the jaw crusher
CO2	Simulate the belt conveyor , classifier , magnetic separator
CO3	Interpret the simulated results
CO4	Discuss the modification of real plant alterations