



# DR.T.THIMMAIAH INSTITUTE OF TECHNOLOGY

## DEPARTMENT OF MINING ENGINEERING

F.No:DrTTIT/IQAC/2020-21/075L

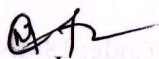
Semester: 3

Course1: MATHEMATICS -III

Course1 Code: 18MAT31

Course Outcomes: After studying this course, the students will be able to:

CO 1	Use Laplace transform and inverse Laplace transform in differential/ integral equation arising in network analysis, control systems.
CO 2	Use Fourier series to solve periodic functions and their application in system communication, digital signal processing and field theory.
CO 3	Use Fourier transform and z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
CO 4	Solve 1st and 2nd order ODE'S arising in Engineering problems using single step and multistep Numerical methods.
CO 5	Determine the extremals of functions using Calculus of variations and problems arising in dynamics of rigid bodies and vibrational analysis.

  
Course Instructor:

  
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Course2: ELEMENT OF MINING ENGINEERING.

Course2 Code: 18MN32

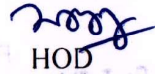
Course Outcomes: After studying this course, the students will be able to:

CO1	Students will gain knowledge on stages of mine life cycle and method of opening the mine.
CO2	They will have the knowledge of design of drilling pattern used in drive of adit. Shaft and incline.
CO3	They will have the knowledge of Geo-technical and economical aspects of opening an mine opening
CO 4	They will be able to use the techniques, skill and modern engineering tools necessary for mine development project
CO 5	They will be able to identify, formulate and solve engineering problems based on given condition

Course Instructor: 

  
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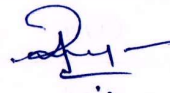
**Course: MINE SURVEYING-1**

**Course Code: 18MN33**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Summarize the distance, elevation and angular measurements used in surveying (Understand)
CO 2	Calculate angle, bearing, distance, and elevation by conventional and optical means (Application)
CO 3	Determine the location of a station in a traverse (Application)
CO 4	Compute area and volume of a given location (Application)
CO 5	Estimate the error in measurements and apply correction (Application)

Course Instructor: **RAJA S.**

Signature 

**Course: MECHANICS OF MATERIALS**

**Course Code: 18MN34**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the basic concepts of mechanics of materials & behaviour of materials under varying loading conditions.
CO 2	Determine the relation between stress, strain and different elastic constants under given loading conditions
CO 3	Determine normal stress, shear stress, principal stresses, principal angles, maximum shear stress & its location by analytical method
CO 4	Determine the bending moment & shear force at any point in a beam, also shear force and bending moment diagrams
CO 5	Understand the behaviour of circular cross section shafts under torsion

**M. Mahendran J**  
Course Instructor:

  
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**Course:** Drilling and Blasting

**Course Code:** 18MN35

Course Outcomes: After studying this course, the students will be able to:

CO 1	Select drilling equipment for drilling in mines under various conditions
CO 2	Select explosives and accessories for mine specific blasting
CO 3	Select accessories used in blasting and various methods of blasting
CO 4	Handle explosives and other accessories with safety
CO5	Understand the mechanics of blasting which in turn helps in blasting design

Course Instructor: *Yunakeshwar Conind*

Signature *[Signature]*

**Course:** Mineralogy, Petrology and Stratigraphy

**Course Code:** 18MN36

Course Outcomes: After studying this course, the students will be able to:

CO 1	Be familiarized with the size, shape, mass & density of earth, age of earth, internal structure of earth, earthquake and volcanism.
CO 2	Study physical properties of the mineral.
CO 3	Study igneous, sedimentary and metamorphic rocks, To learn the principles of stratigraphy, units of stratigraphy, classification and correlation of stratigraphy
CO 4	Be familiarized with the important geological formations: Archeans, Cuddaphs, Vindhyans, Gondwanas and Tertiaries.

Course Instructor: *[Signature]*  
(RAJESHWARI T)

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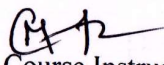
**Semester: 4**

**Course: Mathematics-IV**

**Course Code: 18MAT41**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Use the concept of analytic functions and complex potential to solve the problems arising in electromagnetic field theory
CO 2	Utilize conformal transformation and complex integral arising in aerofoil theory
CO 3	Apply discrete and continuous probability distributions arising in engineering fields
CO 4	Make use of correlation regression analysis to fit suitable mathematical module for the statistical data.
CO 5	Construct joint probability distribution and demonstrate validity of testing the hypothesis

  
Course Instructor:

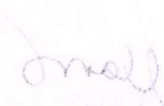
  
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**Course: UNDERGROUND METAL MINING**

**Course Code: 18MN42**

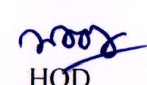
Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the mine development for operating a mine by underground mining method
CO 2	Acquire knowledge about stoping and the factors influencing stoping methods
CO 3	Gain knowledge about the different methods of stoping
CO 4	Explain the special methods of underground mining and design the underground stopes

  
Course Instructor: JOHN GLADIOUS.J

  
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**Course: MINE SURVEYING-II**

**Course Code: 18MN43**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Outline the duties and responsibility of a surveyor in a mine (Understand)
CO 2	Design simple curve in haul roads (Application)
CO 3	Apply conventional, optical and digital means of measurements to obtain angle, bearing, distance, elevation, area, volume and co-ordinates (Application)
CO 4	Connect baseline from surface to underground and control the direction of drives in -underground (Application).
CO5	Outline the developments and application of digital instruments in surface and underground surveying (Understand)

Course Instructor: RAJA S.

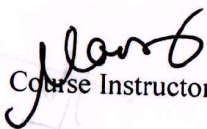
  
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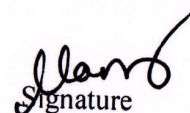
**Course: MINING MACHINERY**

**Course Code: 18MN44**

Course Outcomes: After studying this course, the students will be able to:

CO 1	To demonstrate types, construction, size, capping and splicing of wire ropes used in mines.
CO 2	To describe various transportation equipments used to transport minerals, men and materials in mines.
CO 3	To describe winding systems, their suspension gear and braking arrangements, used in underground mines
CO 4	To describe various winning machines used in mines for extraction of minerals.
CO 5	To summarize types, applications of pumps used in mines.

  
Course Instructor: Dr. Manjunath A

  
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**Course: GEOLOGY FOR MINING ENGINEERS**

**Course Code: 18MN45**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Identify, formulate and solve the problems of economic minerals
CO 2	Learn to use the technique skills
CO 3	Learn to use modern engineering tool necessary for Geophysical and geochemical prospecting
CO 4	Identify coal & petroleum deposits
CO 5	Familiarize with exploration prospecting sampling ore estimation and report writing

*RAJESHWARI. T*

Course Instructor:

*Rajeshwari T*

Signature

**Course :THERMODYNAMICS AND FLUID MECHANICS**

**Course Code:18MN46**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the basic concepts of conversion of heat and work according to the laws of thermodynamics.(understand)
CO 2	Determine the work done and efficiency of reciprocating air compressor in both surface and underground mine conditions.
CO 3	Understand the concepts of pumps and flow through pipes.(understand)
CO 4	Understand the behaviour of fluids at hydrostatic equilibrium & the pressure exerted by fluid on an immersed body.(understand)
CO 5	Understand the effects of forces on fluid which is at a state of motion.(understand)

Course Instructor:

*Mahendran J*

*Mahendran J*  
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**Semester: 5<sup>th</sup>**

**Course: Mine Management**

**Course Code: 18MN51**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Summarize Evolution of management, management vis-à-vis administration functions of management, organization structure and industrial ownership, MBE and MBO ( Understand)
CO 2	Explain personal management, motivational techniques, industrial disputes and provisions of industrial legislation ( Understand)
CO 3	Summarize work study used in organization, ( Understand)
CO 4	Make use of work study in relation to improvement of productivity of the system ( Apply)
CO 5	Summarize components of Management information system (MIS) and its implementation ( Understand)

Course Instructor: *Dr. Manas Mukhopadhyay*

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Signature

**Course: Underground Coal Mining**

**Course Code: 18MN52**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Identify the mode of access to reach coal seam and choice of mining method
CO 2	Demonstrate and design Bord and pillar method of mining
CO 3	Demonstrate and design Longwall method of mining
CO 4	Design the extraction of thick coal seam by special methods of mining .

Course Instructor: *JOHN GLADIOUS . J*

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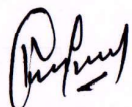
**Course:** Surface Mining

**Course Code:** 18MN53

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the basic concept of surface mining and its associated methods.
CO 2	Estimate the number of drills and heavy earth moving machinery required for medium to very hard rocks during surface mining operation.
CO 3	To analyze the safety of machineries and slopes during various surface mining operation.

Course Instructor: P. Viknam

Signature 

**Course:** Mine Ventilation

**Course Code:** 18MN54

Course Outcomes: After studying this course, the students will be able to:

CO 1	Summarize the occurrence of mine gases, dusts and methane drainage and its control strategies
CO 2	Explain the principles and control measures of heat and humidity behaviour in underground airways (Understand)
CO 3	Apply the principles of air flow in an underground mine ventilation system (Application)
CO 4	Understand the principles of mine fan selection, natural ventilation and its application in underground mines (Understand)
CO 5	Plan a proper mine ventilation systems and solve the ventilation network problems (Application)

Course Instructor: Paul Prasanna Kumar

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**Course: Rock Mechanics****Code: 18MN55**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Ability to describe the importance of Rock Mechanic in the field of mining
CO 2	Identify of the physical and mechanical properties of rocks
CO 3	Ability a calculate the stress & strain in rocks & rock mass
CO 4	Ability to understand the time dependent behaviour by geological models

Course Instructor: *yunakeshwar Gowind*

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*[Signature]***Course: Mine Electrical Engineering****Course Code: 18MN56**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Students will be aware of Indian Electricity Rules 1956.
CO 2	They will be able to differentiate various Motors and generators.
CO 3	They will be able to draw the single line diagram of distribution system in Mines.
CO 4	They will understand types of lighting used in mines and its design.
CO 5	They will be familiar with Electrical Safety devices and its operating principles.

Course Instructor: *Ronald Lawrence . J**[Signature]*  
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## DEPARTMENT OF MINING ENGINEERING

F.No:DrTTIT/IQAC/2020-21/075L

Semester: 6<sup>TH</sup>

Course: Ground Control

CourseCode:18MN61

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the types and effects of underground excavation (Understand)
CO 2	Determine the stress distribution around a underground opening by analytical and numerical methods (Application)
CO 3	Determine the subsidence due to an underground excavation (Application)
CO 4	Select support system based on different properties of rock for an underground excavation (Analyse)
CO 5	Examine the stability of a underground structure due to an excavation (Analyse).

Course Instructor:

RAJA S.

Signature

**MINE**  
Course: Environmental Engineering

Course Code: 18MN62

Course Outcomes: After studying this course, the students will be able to:

CO 1	Study the causes and prevention of Mine Fires, Spontaneous heating.
CO 2	Tackle the mine disasters like Spontaneous heating, Inundation.
CO 3	Design the lighting in underground and open cast mine.
CO 4	Carry out the rescue and recovery operation in a mine.

Course Instructor:

Vijaya Raghavan

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**Course:** Mineral Processing and Fuel Technology

**Course Code:** 18MN63

Course Outcomes: After studying this course, the students will be able to:

CO 1	Interpret the scope, objective, limitations and sampling procedures adopted in mines
CO 2	Suggests suitable equipment for crushing and grinding of minerals in mines
CO 3	Apply the principles of sizing, screens and classifiers in mining industry
CO 4	Compare different concentration methods, dewatering techniques and its application in processing plant
CO 5	Distinguish the concepts of float and sink during processing of minerals
CO6	Classify different solid fuels, combustion of coal and its uses in mining industry

Course Instructor: **PAUL PRASANNA KUMAR**

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**Course:** EMSM

**Course Code:** 18MN643

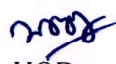
Course Outcomes: After studying this course, the students will be able to:

CO 1	Develop expertise in legal requirement in connection with mine environment
CO 2	Develop expertise environmental management capabilities
CO 3	Understand various Environmental issues and pollutions control in mining and mineral industry

Course Instructor: **P. VIKRAM**

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Course: NCES

Course Code: 18ME651

CO 1	Describe the environmental aspects of non-conventional energy sources
CO 2	To Know the concepts of solar radiation geometry, radiation flux on a tilted surface and solar thermal conversion
CO 3	Describe the need and analyses of liquid flat plate collectors and photovoltaic conversion
CO 4	Understand the concept of wind energy, tidal energy, OTEC with their components and applications
CO5	Understand the concept of Geothermal energy, biomass energy, hydrogen energy with their components and applications

*Balalubrameniam. N.S.*  
Course Instructor:

*N.S. Subh.*  
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## DEPARTMENT OF MINING ENGINEERING

F.No:DrTTIT/IQAC/2020-21/075L

Semester: 7<sup>th</sup>

Course: UNDERGROUND MINE PLANNING & DESIGN

Course Code: 17MN71

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the basic principles of mining law in Indian and role and influence of government on mining industries and identify software for mine planning and designing
CO 2	Explain the process of strategic mine planning and its impact on decision-making during project development and the factors considered in underground coal mine planning.
CO 3	Illustrate surface layouts, pit bottom and pit top layouts for different transport system and analyse and select suitable mine development and working methods.

Course Instructor: P. Vikram

Signature

Course: Ground control

Course Code: 17MN72

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the types and effects of underground excavation (Understand)
CO 2	Determine the stress distribution around a underground opening by analytical and numerical methods (Application)
CO 3	Determine the subsidence due to an underground excavation (Application)
CO 4	Select support system based on different properties of rock for an underground excavation (Analyse)
CO 5	Examine the stability of a underground structure due to an excavation (Analyse)

Course Instructor: (RAJA S.)

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**Course:** MINERAL PROCESSING & FUEL TECHNOLOGY    **Course Code:** 17MN73

Course Outcomes: After studying this course, the students will be able to:

CO 1	Interpret the scope, objective, limitations and sampling procedures adopted in mines
CO 2	Suggests suitable equipment for crushing and grinding of minerals in mines
CO 3	Apply the principles of sizing, screens and classifiers in mining industry
CO 4	Compare different concentration methods, dewatering techniques and its application in processing plant
CO5	Distinguish the concepts of float and sink during processing of minerals
CO6	Classify different solid fuels, combustion of coal and its uses in mining industry

Course Instructor: *Dr. Subhakaran Paul*

Signature *[Signature]*

**Course:** OCCUPATIONAL HEALTH & GENERAL SAFETY    **Course Code:** 17MN742

Course Outcomes: After studying this course, the students will be able to:

CO 1	Identify Occupational Health and Safety standards in mining.
CO 2	Demonstrate safety related Rules, Regulations and Bye-Laws.
CO 3	Understand causes and preventions of Mine Accidents.
CO 4	Apply the basics of Accident Planning.

Course Instructor: JOHN GLADIOUS.J

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**Course: MINE SYSTEM ENGINEERING**

**Course Code: 17MN751**

Course Outcomes: After studying this course, the students will be able to:

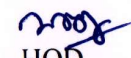
CO 1	Identify and develop operational research models from the verbal description of the Real Systems
CO 2	Create mathematical models that are useful to solve optimization problems.
CO 3	Ability to estimate the optimum cost/distance in transporting the goods.
CO 4	Able to design and develop the analytical models like PERT and CPM for planning, scheduling and controlling projects.
CO 5	Able to apply the different types of strategies of game theory in decision making and also queuing theory

Course Instructor:

Mahendran J

  
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Semester: 8<sup>TH</sup>

Course: MINE LEGISLATION

Course1 Code: 17MN81

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the clauses in the Mines act, 1952
CO 2	Understand briefly the Mines Rules,1955
CO 3	Understand the Mining regulations as per MMR,1961 and CMR,2017
CO 4	Understand the Mines and Minerals (Development and Regulation) Act, 1952 and related rules
CO 5	Summarize the miscellaneous rules related to mining industry

Course Instructor: John Gladious.J

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Course: Computer Application in Mining

Course2 Code: 17MN82

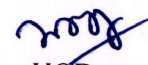
Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the fundamental design process and the hardware components of CAD
CO 2	Summarize the computer graphics software, its configuration, functions and database systems
CO 3	Develop an algorithm for estimating, selecting and predicting the mine workings
CO 4	Plan a simple database management system for the organization
CO 5	Apply a suitable relational model and SQL queries to secure the database of an organization.

Course Instructor: PAUL PRASANNA KUMAR

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Course: ENVIRONMENTAL IMPACT OF MINING

Course3 Code: 17MN834

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe various environmental issues due to mining projects.
CO 2	Identify suitable preventive and control measures for environmental issues due to mining projects
CO 3	Interpret measurement & recording, and prediction of ground vibration levels due to mining projects.
CO 4	Summarize reclamation, Environmental laws, EIA, land acquisition and corporate social responsibility while dealing.

Course Instructor: Dr. Manjunath. A

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