

SWAMI VIVEKANAND UNIVERSITY, SAGAR (M.P.)



SYLLABUS

For

Department of Mining Engineering

Diploma in Mining & Mine Surveying Engineering

Course Code: DMNS

Faculty of Engineering

Duration of Course: 3 Years

Examination Mode: Semester

Examination System: Grading

Swami Vivekanand University, Sironja, Sagar (M.P.)

2015-2016



Swami Vivekanand University, Sagar(M.P.)



1st Semester



Communication Skills (DMNS-0101)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam		
		L	T	P		Theory					Practical							
						End Sem.		Internal			Total (D=A+B+C)	End Sem.		Internal			Grand Total (H=D+G)	
						Max (A)	Min	TW (B)	MS T (C)	Max (E)		Min	LW (F)					
DMNS-0101	Communication Skills	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs		

UNIT – I

Marks :14

COMMUNICATION PROCESS AND ITS NEEDS

How to make communication effective, Barriers in communication, Removal of barriers. Grammar and vocabulary for correct English usage. Determiners, Prepositions, Auxiliary verbs and subject- Verb agreement, Rewrite as directed (change voice, correct form of verbs/ tenses), Vocabulary – Oneword substitution, words often misused and wrongly spelt.

UNIT – II

Marks :14

PASSAGES OF COMPREHENSION

Prescribed passages (six from existing syllabus), Language of Science, Desalination or Desalting Process, Safety Practices, Non-conventional Sources of Energy, Our Environment, Entrepreneurship, Writing summary, moral and characterization of any one story from the book prescribed.

UNIT – III

Marks :14

BUSINESS COMMUNICATION

Principles of effective business correspondence Its parts, mechanics, styles and forms., Application for job, Bio-Data and C.V., Letter of Enquiry, Placing order, Complaint

UNIT – IV

Marks :14

COMPOSITION & TRANSLATION

Writing paragraphs of 150 words on topics of general interest i.e. pollution, ragging college, importance of computers, importance of communication skill, importance of science and technology etc., Translation (Hindi to English and vice- versa).

UNIT – V

Marks :14

UNSEEN PASSAGES & PRECIS WRITING

Answer the questions based on the passage. Give suitable title, Writing Précis.



Reference Books

1. English Conversation Practice, Grant Taylor.
2. Practical English Grammar, - Thomson & Martinet.
3. Communication Skills for Technical Students Book– I, Book – II, M/S Somaiya Publication, Bombay.
4. Living English Structure, S. Allen.
5. English Grammar, Usage, and Composition, Tickoo & Subramanian, S. Chand & Co. Standard Allen Longman.
6. Essentials of Business Communication, Dr. Rajendra Pal & J.S. Korlahalli S.Chand & Sons, New Delhi.
7. Effective Business Communication, M.V. Rodriques, Concept Pub. Co. New Delhi.
8. Communication for Business, Shirely Taylor, Longman, England.
9. Communication for Engineers and Professors, P. Prasad, S.K.Kataria and sons publications, New Delhi.
10. Technical English Book-II, Somaya Publications, New Delhi.



Physics (DMNS-0102)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0102	Physics	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

UNITS & MEASUREMENT: Fundamental and derived units, Scalar and vector, Basic requirements to represent vector, Symbols, abbreviation, and proculation, Linear measurement by vernier calipers, screw gauge and spherometer Angular measurement by angular vernier, **MOTION:** Motion and its type, Linear motion (laws and equation), Circular motion, Angular velocity and relation with linear velocity, Centripetal acceleration, Centripetal and Centrifugal forces Rotatory motion, Axis of rotation, Moment of Inertia, Radius of gyration, Kinetic energy of rotation, Numerical Problems and solution on the topic.

UNIT – II

Marks :14

MOLECULAR PHENOMENON OF SOLIDS, LIQUIDS AND GASES: Postulates Of Molecular Kinetic Theory of Structure of Matter, Brownian motion, Kinetic and Potential energy of molecules, Kinetic theory of gases, Postulates, Calculation of pressure by Kinetic theory, Prove of different gases law by Kinetic theory. **PROPERTIES OF MATTER:** Elasticity: Meaning, definition, stress, stain, Hook's law and elastic limit, Surface Tension : Meaning, definition, molecular forces, cohesive and adhesive forces, surface energy, capillary rise and capillary rise method. Viscosity : Meaning, definition, stream line and turbulent flow, critical velocity, Stock's law. Numerical problems and solution on the topic.

UNIT – III

Marks :14

HEAT: Heat and temperature, concept of heat as molecular motion, Transmission of heat, study state and variable state. Concept of heat capacity, specific heat and latent heat. Calorimeter and its uses, Thermodynamics , Relation between heat and work, Mechanical equivalent of heat, First law of thermodynamics and its application, Second law of thermodynamics and its application. Carnot cycle, Numerical problems and solution on the topic. Heating effect of current and thermoelectricity: Heating effect of electric current: Joule's law, work energy and power in electric circuit, calculation of electric energy. Thermo electricity, See back effect and thermoelectric power. Neutral temperature, emperature of inversion and relation between them, Thermo electric thermometer and thermo couples. Numerical problems and solution on the topic.

UNIT – IV

Marks :14

SOUND: Production of sound waves(Longitudinal and transverse waves), Progressive and stationary waves, Basic knowledge of refraction , reflection, interference and diffraction. Ultrasonic, Audible range, Production of ultrasonic, properties and uses, **OPTICS AND OPTICAL INSTRUMENTS:** Refraction, critical angle and total internal reflection, refraction, through lenses and problems, Power of lenses, Spherical and chromatic aberrations, Simple and compound microscope, telescope and derivation for their magnifying power, Numerical problems and solution on the topic.



UNIT – V

Marks :14

ELECTROSTATICS AND ELECTROMAGNETIC INDUCTION: Coulomb's law, Electric field intensity, potential. Capacity, principle of capacitor, types of capacitor, combination of capacitors, Electromagnetic Induction: Faraday's law, Lenz's law, Self and mutual inductance, Transformer and electric motor, Induction coil. **MODERN PHYSICS, BASIC ELECTRONICS:** Photoelectric effect, threshold frequency, Einstein- equation, Photo electric cells, Radioactivity : decay constant, Half life, mean life, Properties of nucleus, nuclear mass, mass defect, Production of x-rays, properties and its uses, Thermal emission, semiconductors, Types of semiconductors, Explanation of conductor, semiconductor and insulators on the basis of band theory, P-N junction, diode as rectifier.

Reference Books

1. Applied Physics Vol. 1 & 2, Saxena and Prabhakar.
2. Physics, - Tti Publication.
3. Physics Vol. 1 &2, Halliday and Resnic R.
4. Engineering Physics, - Gaur and Gupta.
5. Principle of Physics, Brij Lal & Subramanyan.
6. Physics for Technical Education, LS Zednov.

List of Experiments

1. Refractive index of prism (I-d) curve
2. Refractive index of prism (spectrometer)
3. Focal length of a convex lens by u-v method
4. Focal length of a convex lens by displacement method
5. Verification of Ohm's law
6. To find out unknown resistance by meter bridge
7. To find out internal radius of hollow tube by vernier calipers.
8. To find out volume of given cylinder by screw gauge.
9. Surface tension by Capillary rise method.
10. Coefficient of viscosity
11. Coefficient of Thermal conductivity by searl's method.
12. Verification of Newton's cooling law.



Chemistry (DMNS-0103)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H=D+G)		
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal			Total (G=E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0103	Chemistry	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

ATOMIC STRUCTURE AND RADIOACTIVITY : Discovery of electron, proton, neutron and nucleus. Rutherford's and Bohr's model of atom. Bohr-Bury scheme of filling the electrons in various orbits. Idea of s, p, d, f orbital. Alpha, Gamma and Beta rays, theory of radioactivity, Group displacement law, half-life period, numerical problems on half-life period, fission and fusion.

SURFACE CHEMISTRY AND ITS APPLICATION: True solution, colloidal solution and suspension, lyophobic and lyophilic colloids, optical and electrical properties of colloids, coagulation, coagulants, idea about gels and emulsions.

ELECTROCHEMISTRY: Electrolysis, Faraday's laws of electrolysis, Numerical problems on Faraday's Law, electroplating of copper and nickel.

COLLIGATIVE PROPERTIES: Osmosis & osmotic pressure, Relative vapour pressure and Raoult's law. Internal energy (enthalpy) Entropy, Entropy function free energy, Effect of change in temperature catalysis.

UNIT – II

Marks :14

CHEMICAL BONDING AND CATALYSIS: Bonding: Nature of bonds- Electrovalent, Covalent, coordinate and hydrogen bond. Catalysis : Types, theory characteristic, positive, negative, auto and induced catalyst. Catalytic Promoter, and catalytic inhibitors. Industrial Application of catalysis.

WATER: Sources of water, types of water, hardness of water, its causes, types and removal, Boiler feed water, harmful - effects of hard water in boiler. Municipal water supply. Numerical on soda lime process. Determination of hardness of water by O. Hener's, EDTA and soap solution method.

UNIT – III

Marks :14

METALS AND ALLOYS : Physical and chemical properties of metals, copper, iron, aluminum, tin, nickel. General principle of metallurgy, minerals/ ores, ore dressing, roasting, smelting, blast-furnace, fluxes, purification. Explanation of alloying purposes, methods of alloying, composition and uses of alloy like brass, bronze, duralium, German silver, gun metal, solder, stainless steel, casting and bearing alloy. Ionization, pH value corrosion and protection: Arrhenius theory of ionization, factors affecting ionization. pH meaning (numerical), Buffer solutions and Buffer actions, choice of indicator (acidimetry and alkalimetry). Explanation of corrosion, types of corrosion, factors affecting corrosion, corrosion control (protection against corrosion), metal and organic coating for corrosion control.



UNIT – IV

Marks :14

GLASS, CEMENT AND REFRACTORY: Glass: Basic raw materials for glass, composition and manufacture of glass, varieties of glass and annealing of glass, Cement : Constituting compounds in cement, Composition of Portland Cement, its manufacture, setting and hardening of cement. Refractories : Meaning, characteristics , use of common refractory materials.

HIGH POLYMERS, RUBBER AND INSULATORS: Polymerization and condensation, classification of plastics, Compounding and Moulding constituents of plastics. Preparation Properties and uses of PVC, polyethene, polystyrene, polyamides, polyesters , Bakelite. Synthetic fibers - nylon, rayon, decron, and polyesters. Definition characteristics , classification and properties of insulators. Glass, wool and thermocole. Idea about rubber and vulcanization .

UNIT – V

Marks :14

LUBRICANTS, PAINTS AND VARNISHES: Lubricants: Meaning , type and theory of lubricants, properties of a good lubricants, Flash, and fire point and cloud point, emulsification number, viscosity. Paints and Varnishes : Meaning, ingredients and characteristics of good paints and varnishes, their engineering applications.

FUELS, FIRE EXTINGUISHERS AND EXPLOSIVES : Classification of fuel, gross and net calorific value, Determination of a solid fuel by bomb calorimeter , octane and octane number. Proximate analysis of fuel, its utility, crude petroleum, products of fractional distillation . Fire extinguishers - Description and use. Explosives - Meaning, types, characteristic and use of explosives. Name Dynamite, lead azide, T.N.T., Picric acid, R.D.X. Pollution and control: Introduction and chemical toxicology, air and water pollution, control of air and water pollution. Harmful effect of different gases like carbon mono-oxide, carbon dioxide, sulphur dioxide, nitric oxide, nitrous and lead.

Reference Books

1. Physical Chemistry, Bahl and Tuli
2. Inorganic Chemistry, Satyaprakash
3. Modern Text Book of Applied Chemistry, Dr. G. C. Saxena, Jain Prakashan, Indore
4. Applied Chemistry, Dr. G. C. Saxena, Deepak Prakashan, Gwalior
5. Applied Chemistry, Shrivastava & Singhal, Pbs Publication, Bhopal
6. Engineering Chemistry, Uppal
7. Engineering Chemistry, – Rao And Agarwal
8. Engineering Chemistry, P.C. Jain
9. Polymer Chemistry, O.P. Mishra
10. Applied Chemistry, H.N. Sahni, Deepak Prakash

List of Experiments

1. To identify one Anion and Cation in a given sample.
2. Determination of flash point and fire point of a given sample of oil by Abel's apparatus.
3. Determination of viscosity by Red Wood Viscometer no. 1 and no.2.
4. Redoximetry Titration :
 - a. Percentage of Iron in given sample of alloy.
 - b. Determination of strength of ferrous ammonium sulphate.
 - c. Determination of strength of anhydrous ferrous sulphate and ferrous sulphate.
5. Determination of hardness of water by :
 - a. EDTA Method and Soap Solution Method
6. Determination of solid content in the given sample of water.
7. Determination of percentage of moisture in the given sample of coal by proximate analysis.



Mathematics (DMNS-0104)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G= E+F)
						Ma x (A)	Min	T W (B)	MS T (C)		Ma x (E)	Min				
DMN S-0104	Mathematics	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT – I

Marks :14

ALGEBRA: Permutation- Meaning of factorial n, Permutation of 'n' dissimilar thing taken 'r' at a time. Combination of n dissimilar things taken 'r' at a time, Binomial Theorem, Statement of the theorem for positive integer General Term, Middle term, Constant term, Partial Fractions, Define a proper-improper fraction, Break a fraction into partial fraction whose denominator contains Linear, Repeated linear and Non repeated quadratic factors. Determinant, Concept & principles of determinants, Properties of determinant, Simple examples. Complex Numbers, Algebra of Complex

UNIT – II

Marks : 14

TRIGONOMETRY : Allied angles. Trigonometrical ratios of sum and difference of angles, (Only statement), Sum and difference of trigonometric ratios (C-D formula), Multiple angles (Only double angle and half angle), Properties of triangle (without proof).

MATRIX : Definition of Matrix. Types of Matrix. Row, Column, Square, Unit, Upper and lower triangular, Symmetric & Skew Symmetric, Singular and non Singular Matrices. Adjoint of a Matrix. Inverse of a Matrix.

UNIT – III

Marks :14

CO-ORDINATE GEOMETRY : Co-ordinate System : Cartesian and Polar. Distance, Division, Area of a triangle. Locus of a point and its equation. Slope of St. Line, Angle between two St. lines. Parallel and perpendicular St. lines. Standard and general equation of St. line. Point of intersection of two st lines.

STATISTICS : Measures of Central tendency (Mean, Mode, Median), Measures of Dispersion (Mean deviation, standard deviation).

UNIT – IV

Marks :14

DIFFERENTIAL CALCULUS : Define constant, variable, function. Value of the function. Concept of limit of a function. Definition and concept of differential coefficient as a limit. Standard results. Derivatives of sum, difference, product, quotient of two functions. Diff coeff. of function of a function. Diff. coeff. of implicit function. Logarithmic Differentiation. Differential coeff. of Parametric function.



UNIT – V

Marks :14

INTEGRAL CALCULUS : Definition as a inverse process of differentiation, Standard Results (including inverse function), Methods of Integration, Substitution, Integration by parts, Breaking up into partial fraction, Concept of Definite Integral.

VECTOR ALGEBRA : Concept of Vector and Scalar Quantities. Different types of vectors. Addition and subtraction of vectors. Components of a vector, Multiplication of two vectors: Scalar Product, Vector Product, Applications (Work done, power & reactive power).

Reference Books

1. Differential Calculus, Gorakh Prasad.
2. Integral Calculus, Gorakh Prasad.
3. Co-ordinate Geometry, S.L. Loni.
4. Engineering Mathematics, Dr. S.K. Chouksey & Manoj Singh.
5. Mathematical Statistics, Ray and Sharma.
6. Higher Engineering Mathematics, B.S. Grewal.



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2nd Semester



Applied Mechanics (DMNS-0201)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H=D+G)		
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal (F)			Total (G=E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0201	Applied Mechanics	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

COMPOSITION AND RESOLUTION OF FORCES

Definition , Effect, characteristics of force, System of Forces, Principle of Transmissibility of Forces, Concept of Resultant Force, Law of –Parallelogram of Forces, Triangle of Forces, Polygon of Forces, Determination of Resultant of two or more concurrent forces (analytically and graphically)

PARALLEL FORCES AND COUPLES

Classification of Parallel Forces, Methods of finding resultant Force of parallel forces- analytically & graphically, Position of resultant force of parallel forces- Definition, Classification and characteristics of a force Couple, moment of couple

UNIT – II

Marks :14

MOMENTS AND THEIR APPLICATIONS

Definition, Types and law of moment-Varignon’s Principle of moment and its applications Lever and its Applications. Types of supports and determination of support reactions of a simply supported beam subjected to point load and uniformly distributed load (UDL).

EQUILIBRIUM OF FORCES

Equilibrium of a system of concurrent forces, Conditions and types of Equilibrium Lami’s Theorem and its applications.

UNIT – III

Marks :14

CENTRE OF GRAVITY

Difference between Centroid and Center of Gravity (CG), Centroid of standard plane figures and CG of simple solid bodies, Method of finding out Centroid of composite plane laminas and cut sections, Method of finding out CG of Composite solid bodies.

FRICTION

Concept and types of friction, Limiting Friction, coefficient of friction, angle of friction, angle of repose, Laws of friction (Static and Kinetic), Analysis of equilibrium of Bodies resting on Horizontal and inclined Plane, Utility / Nuisance value of friction.

UNIT – IV

Marks :14

SIMPLE LIFTING MECHINES

Concept of lifting Machines, Definition of Mechanical Advantage, Velocity Ratio and Efficiency of Machines and their relation Reversibility of Machines and condition for self locking machine, Law of Machines, Maximum mechanical advantage and maximum efficiency of machine, Friction in machine (In terms of Load and effort), Calculation of M.A., V.R. and efficiency of following machines, Simple wheel and axle Differential wheel and axle Single purchase crab Double purchase crab Simple screw jack, Different System of simple pulley blocks.



MOTION OF A PARTICLE

Definition of speed, velocity, acceleration, uniform velocity, uniform acceleration and variable acceleration, Motion under constant acceleration/ retardation (equations of motion) Motion under force of gravity, Concept of relative velocity, Definition of projectile, velocity of projection , angle of projection, time of flight, maximum height, horizontal range and their determination, Definition of angular velocity, angular acceleration and angular displacement, Relation between linear and angular velocity of a particle moving in a circular path, Motion of rotation under constant angular acceleration.

UNIT – V

Marks :14

LAWS OF MOTION

Newton's Laws of motion and their applications.

WORK, POWER AND ENERGY

Definition unit and graphical representation of work, Definition and unit of power and types of engine power and efficiency of an engine. Definition and concept of Impulse, Definition, unit and types of energies, Total energy of a body falling under gravity.

Reference Books

1. A text book of Applied Mechanics – R.S. Khurmi , S.C. Chand & Co. , New Delhi
2. Applied Mechanics – I.B. Prasad, Khanna Publishers, New Delhi
3. Applied Mechanics (Hindi) – R.S. Jog, Anand Publishers, Gwalior Applied

List of Experiments

1. Verification of laws of parallelogram of forces.
2. Verification of laws of polygon of forces
3. Verification of laws of moments
4. Determination of forces in the members of Jib Crane
5. Determination of Centroid of plane lamina by graphical method
6. Determination of coefficient of friction for surfaces of different materials on horizontal plane
7. Determination of coefficient of friction for surfaces of different materials on an inclined plane
Determination of mechanical advantage, velocity ratio and efficiency of the following lifting machines.
8. Simple wheel and axle Differential wheel axle Single purchase crab Double purchase crab Simple pulley block Simple screw jack
9. Measurement of B.H.P. of an engine using rope break dynamometer



Environmental Engineering and Safety (DMNS-0202)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical			Grand Total (H=D+G)		
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal		Total (G=E+F)	
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0202	Environmental Engineering and Safety	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT – I

Marks :14

INTRODUCTION TO ENVIRONMENT.

The Biosphere, biotic and abiotic, An aquatic ecosystem, Types of pollution, Impact of human being on environment, Impact of environment on human being, Basic approach to improve environmental qualities, Roll of an environmental engineer.

AIR POLLUTION SOURCES AND EFFECTS.

Standard definition of air pollution, Composition of natural air, Names of air pollutants, Classification of air pollutants, primary and secondary pollutants, Classification of source of air pollutants on different bases, Definition of different types of aerosols, Effect of air pollution on: human health, material properties, vegetation, Major toxic metals and their effects, Major environmental phenomenon e.g., acid rain, global warming, green house effect, ozone layer depletion, Air quality standards, Brief description of air pollution laws.

UNIT – II

Marks :14

METEOROLOGICAL ASPECTS OF AIR POLLUTANT DISPERSION.

Meteorological parameters influencing air pollution, Environmental laps rate, temperature inversion, atmospheric stability and adiabatic loss rate, Turbulence, topographical effects, Plume behavior, looping, coning, fanning fumigation, lofting , trapping.

AIR POLLUTION CONTROL METHODS AND EQUIPMENTS.

Natural purification processes of air, Artificial purification methods of air, Brief description of following control equipments along with sketch e.g, gravitation settling chamber, cyclone, scrubber, bag house filter, electrostatic precipitator, Brief description of following processes for the control of gaseous pollutants e. g., absorption, adsorption, condensation, combustion etc.

UNIT – III

Marks :14

WATER POLLUTION SOURCES AND CLASSIFICATION.

Water resources, Uses of water, Classification of water, Origin, composition and characteristics of domestic waste water as well as industrial waste water, Biochemical oxygen demand, Water pollution laws and standards, Uses of waste water, Classification of waste water, Chemical oxygen demand.

WASTE WATER TREATMENT METHOD.

basic processes of water treatment. Meaning of primary, secondary and tertiary treatment. Flow chart of a simple effluent treatment plant, Theory of industrial waste treatment, Volume reduction, neutralization and proportioning.



UNIT – IV

Marks :14

SOLID WASTE MANAGEMENT.

Sources and classification of solid waste, Public health aspects, Disposal methods – open dumping , sanitary , land fill. Incineration , composting, Potential methods of disposal, Recovery and recycling of paper, glass, metal and plastic.

NOISE POLLUTION AND CONTROL.

Sources of noise pollution, Units of Noise pollution measurement, Allowable limits for different areas, Problems of noise pollution and measures to control it, Noise pollution control devices brief discussion.

UNIT – V

Marks :14

SAFETY PRACTICES

Responsibility of employees and employers regarding health and safety, Fire hazards ,prevention and precautions, Industrial hazards prevention and protection, Protection from air and noise pollution.

Reference Books

1. Environmental pollution control Engineering by C.S. Rao.
2. Air pollution and control by Seth.
3. Air pollution by M.N Rao.

List of Experiments

GROUP A AIR POLLUTION (Any one experiment may be selected from this group)

1. Air monitoring and determination of SPM , CO, Nox, SO₂ with high volume sampler.
2. Monitoring of stack gases and determination of SPM , CO, Nox, SO₂ with slack monitoring kit.

GROUP B NOISE POLLUTION

3. Determination of sound pollution in (a) Auditorium (b) Factories (c) Busy roads (d) Theatre (e) TV rooms (select any three situations)

GROUP C INDUSTRIAL WASTE WATER (Any Two experiment may be selected from this group)

4. Determination of BOD/COD ratio in industrial waste water.
5. Determination of Ph and alkanity/ acidity in industrial waste water.
6. Determination of solids in industrial

GROUP D POLLUTION STANDARDS(Any Two experiment may be selected from this group)

7. Study of drinking water standards.
8. Study of effluent standards for water disposal.
9. Study of air pollution standards.



Introduction to Computers (DMNS-0203)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G= E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0203	Introduction to Computers	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

INTRODUCTION TO COMPUTERS

Basic Concepts-Generations of Computers Overview of computer Systems Classifications of Computers Characteristics of Computers Applications of Computers. Numbers System & Codes-Decimal, Binary, Octal, Hexadecimal Conversions from one system to other Binary Coded Decimal & ASCII Code. Computer Hardware: Input Devices-KeyBoard, Mouse, Trackball, Joystick, Scanner, OMR OCR Bar-Code Reader, MICR, Digitizer, Card Reader, Voice Recognition, Web Cam, Video Cameras, Etc. Output Devices-Monitors, Printers : Dot matrix, Inkjet & Laser, Plotters, Commuter, Output Micro Film (COM), Multimedia Projector, Speech Synthesizer, Dumb, Smart & Intelligent Terminal.Storage Devices

UNIT – II

Marks :14

Primary and Secondary Storage- Characteristics and Limitation, Floppy, Hard disk, CD ROM DVD, Disk Cartridge. Microprocessor-Registers, Arithmetic Unit, Control Unit, Buses, Instruction Set, Processor Speed.,Memory Concepts. Concept of Memory-Unit of Memory, Types of Memory, RAM,ROM, PROM, EPROM, EEPROM, Cache Memory. Computer Software-System Software Vs Application Software, Operating System Programs, Language Processor, Assembler, Compiler & Interpreter,Application Software, Types of Application Software and their examples., High Level Language, Low Level Language, Assembly Language. Multimedia-Basics of Multimedia,Components- Text, Graphics, Animation, Audio, Images & Video. Multimedia Applications.

UNIT – III

Marks :14

OPERATING SYSTEM

Overview of DOS- Internal Commands, External Commands. Windows Operating System-Overview of different versions of Windows Characteristics and Facilities of Windows, Terminologies of Windows – Desktop, Icon, Menu etc. Components of Desktop. Working with Files and Folders. Windows Utilities and Accessories – Notepad, WordPad, Paintbrush, Windows Explorer, Calculator. Introduction to Linux- An overview of Linux, Basic Linux elements System, Features Software, Features File structure, Linux H/W & S/W requirements.

UNIT – IV

Marks :14

WORD PROCESSING

Saving, Closing, Opening of documents, Selecting text Editing text, Finding and replacing text\ Printing documents, Merge Documents. Character and paragraph Formatting, Page Design and layout. Spell Check, Creating Tables and Charts. Handling Graphics

SPREADSHEET PACKAGE



Spreadsheet concept – Need, advantage, Terminology like cell, row, column etc. Working with Spreadsheet– Creating, Saving, Editing and printing, Entering data – Entering number, text, date, time etc. Selecting cells – Cut, copy, paste date, Editing Worksheet data. Formatting – Text and Cells, Applying border shading, background patterns, conditional formats, positioning cells, formatting numbers, text, Date, time. Creating formulas- Entering, Editing, Using Functions, Controlling calculations. Working with Charts- Creating charts, Adding & changing text, changing the view and display, types of charts. Presentation Software: Introduction Presentation design tools Presentation terminologies, Creating, Opening and Saving Presentation. Working with different views Creating and Organizing slides, Adding and Formatting text in slides Formatting paragraphsm Adding drawings and objects Creating special effects Working with table and charts Printing Presentation.

UNIT – V

Marks :14

DATABASE

Introduction – need, Characteristics and terminologies of database, Types of database – relational, Hierarchical and Network. Basic entities – Tables, records, Data types, Data, Validation and constraints, keys relation between tables. Query – Select, Insert, Update, Delete. Forms – Creating forms, Forms controls Report Designer- Customize formats, grouping reports. Computer Communication & Networks: Information Networks- The Technology of Workgroup Computing, Types of network, Network topology.Network components. Data Communication-Introduction to Data Communication,Types of Data,Transmission media. Internet and E-mail- Internet Basics, Websites- Applications, terminologies, naming conventions., Web Browsers- Types, Navigation and tools, E-mail – concept, terminologies, mailing services provider, advantages comparison with Conventional mailing. Search engine – concept, search engine websites, searching methods.

Text Books

1. S . Jaiswal, A First Course in Computers, Golgotha Publication
2. Slotnick, Butterfield, Colantonio and Kopetzky, Computers & Application, C.C. Health & Company
3. Ron Mansfield, The Complete Guide to Microsoft Office Professional, Sybex /BPB Asian Edition
4. Hardware Bible, BPB Publication
5. Learning Windows in 24 Hours, Sam Techmedia

Reference Books

1. Suresh K. Basandra, Computers Today, Galgotia Publication
2. Norton Peter, Inside IBM PC
3. Computer Hardware, Osborne Series
4. Hardware Bible, BPB Publication
5. Learning Windows in 24 Hours, Sam Techmedia
6. Chapman, Understanding windows, BPB Publication



List of Experiments

1. Study of various components of computer like CPU, keyboard, mouse, monitor, printer, CVT and storage devices.
2. Internal and external commands of DOS.
3. Using Windows operating system, study of desktop, control panel, accessories and settings.
4. File management in windows explorer, Study of WordPad, NotePad, PaintBrush, Calculator etc. Study of Linux operating system.
5. Study of MS-word – opening and saving of documents, formatting, editing and spell check, find and replace, printing, merging. Creating Table, Charts and Graphics.
6. Study of Spreadsheet – creating, saving, editing and printing. Entering data, selecting cells, formatting text, applying border shades and backgrounds, creating formulas, creating charts.
7. Study of Power Point – creating, opening, editing and saving of slides. Adding and formatting text, creating, animations, working with images and special effects. Printing presentation.
8. Study of MSAccess– creating, saving, editing and printing of tables. Managing relationships, writing queries e.g. SELECT, UPDATE, DELETE, INSERT. Forms designing and report printing.
9. Study of Web Browser and mailing programs.



Engineering Drawing (DMNS-0204)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal		Total (G= E+F)	
						Max (A)	Min	TW (B)	MS (C)		Max (E)	Min				
DMNS-0204	Engineering Drawing	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

INTRODUCTION TO DRAWING INSTRUMENTS:

Introduction of drawing instruments, materials and their uses, Applications of minidrafter Applications of compass and divider Applications of French curves and spline Pencils grades and their uses, Designation and sizes of drawing sheet and drawing board.

PLANNING AND LAYOUT OF DRAWING SHEET:

Planning of drawing sheet as per I.S.: 696-1972 (SP 46: 1988). This should include- Margin, Title Block, Zoning, Revision panel, Folding marks, Numbering of sheet.

CONVENTIONAL REPRESENTATION:

Conventional representation of the following as per BIS practice. Common Engineering materials Electrical installations and fittings – Main switches, (lighting and power), socket outlets (3 pin 5AMP, 3pin15AMP), bell, buzzer, loud speaker, Aerial, ceiling fan, exhaust fan, Bracket fan, fan regulator, battery and earth point.

Electronics components- Diode: Zener, varactor, Scotty, step recovery, light emitting diode (LED), PNP and NPN transistors, resistance, capacitor, Inductors (fixed and variable both), IC (8pin and 14pin), SCR, TRIAC, DIAC, UJT, FET, MOSFET, LOGIC GATES.

Sanitary fittings- showerhead, wall lavatory basin, corner Lavatory basin, urinal stall, kitchen sink, Indian type WC, Water closets (Asian pan, urissapan, Anglo-Indian, European)

Building -single and double swing doors and windows.

Mechanical components- Internal and external threads, slotted head, Square end and flat, radial arms and ribs, serrated shaft, splined shaft, Chain wheel, bearing, straight and diamond knurling, Compression and tension spring, leaf spring (with and without eye), Spur and helical gear.

LINES, LETTERING AND DIMENSIONING:

Introduction of type of lines and their applications, Single stroke vertical, inclined letters (capital and lowercase) And numerals. Dimensioning: Elements of dimensioning- dimension line, extension line, arrowhead And leader line. Dimensioning system – Aligned and unidirectional. Dimensioning of Arcs and Circles. Angular Dimensioning. Dimension of counter sunk and counter bore.

UNIT – II

Marks :14

GEOMETRICAL CONSTRUCTIONS AND ENGINEERING CURVES

Divide a line into any number of equal parts by parallel line method, Bisecting of line and angle. Construction of triangles and polygons Introduction of conic sections (curves), Construction of Ellipse by Eccentricity and Concentric circles methods, Construction of Parabola by Eccentricity and Rectangle methods, Construction of Hyperbola by Eccentricity method, Construction of Cycloid, Construction of Involute of circle and polygon, Construction of Archimedian Spiral of any number of convolutions.

SCALES:



Introduction of scales and their applications, Concept of reducing, enlarging and full size scale
Classification of scales – plain, diagonal, vernier, Scale of chord and comparative scales
Definition of R.F. Construction of plain and diagonal scales.

UNIT – III

Marks :14

THEORY OF PROJECTION AND PROJECTION OF POINTS, LINES AND PLANES

Definition of various term associated with theory of projection- Planes of projection, Quadrants, first & third angle projection method, Projection of points in all the four quadrants. Projection of lines parallel to HP and VP both, perpendicular to one plane and parallel to other, Inclined to one plane and parallel to other, knowledge of projection of line inclined to both the plane, (No practice required).

Projection of planes – Perpendicular to HP and VP both, Perpendicular to one plane and parallel to other, Inclined to one plane and perpendicular to other, Knowledge of projection of plane inclined to both the planes.

UNIT – IV

Marks :14

PROJECTIONS OF SOLIDS:

Projection of cylinder, cone, prism and pyramid. Under the conditions :- Axis parallel to HP and VP, Axis perpendicular to HP and parallel to VP, Axis perpendicular to VP and parallel to HP, Axis inclined to HP and parallel to VP, Axis inclined to VP and parallel to HP, Axis inclined to both HP and VP.

SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES:

Section of cone, cylinder, prism and pyramid (Solid resting on its base in the HP i.e. the Axis perpendicular to HP and parallel to VP) in the cases:- Section plane parallel to HP and perpendicular to VP, Section plane parallel to VP and perpendicular to HP, Section plane inclined to HP and perpendicular to VP, Section plane inclined to VP and perpendicular to HP. Drawing True shape of section.

Introduction to development of lateral surface of solids- Cone, Cylinder, Prism and Pyramids (Simple and truncated). Under the condition – solid resting on its base in the HP and axis Perpendicular to HP and parallel to VP. Development of funnel and elbow.

INTERSECTION OF SURFACES

Intersection of following cases – Cylinder to cylinder and Prism to prism (With their axis intersecting and perpendicular to each other.)

UNIT – V

Marks :14

ORTHOGRAPHIC PROJECTIONS & FREE HAND SKETCHING:

Principles of orthographic projections- Identification of necessary views and superfluous view Selection of front view. Preparation of necessary orthographic views of simple objects From given pictorial views. Dimensioning of orthographic views as per standard practice. Free hand sketches of simple objects (Using Pencil, Eraser & Paper only)

ISOMETRIC VIEWS

Concept of isometric projection and isometric view (Isometric Drawing), Construction of isometric scale, Construction of isometric view of polygon and circle, Construction of isometric view of cone, cylinder, prism and pyramids, Construction of isometric view of simple objects from given orthographic views.



Text Books

1. ENGINEERING DRAWING – N.D. Bhatt
2. ENGINEERING DRAWING – R.K. Dhawan
3. ENGINEERING DRAWING – P.S.Gill

Reference Books

1. ENGINEERING DRAWING – P.S.Gill
2. SP: 46-1988 Bureau of Indian standard
3. PRINCIPLES OF ELECTRONICS - Malvino

Workshop Practice (DMNS-0205)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min	LW (F)			
DMNS-0205	Workshop Practice	-	-	4	4	-	-	-	-	-	60	18	40	100	100	-

PURPOSE

To provide the students with hands on experience on different trades of engineering like fitting, carpentry, smithy, welding and sheet metal.

INSTRUCTIONAL OBJECTIVES

To familiarize with

1. The basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
2. The production of simple models in the above trades.

Text Books

1. Gopal, T.V., Kumar, T., and Murali, G., A first course on workshop practice – Theory, practice and work book, Suma Publications, 2005.

Reference Books

1. Kannaiah, P. & Narayanan, K.C. Manual on Workshop Practice, Scitech Publications, Chennai, 1999.
2. Venkatachalapathy, V.S. , First year Engineering Workshop Practice, Ramalinga Publications, Madurai, 1999.

List of Experiments

1. EMPHASIS TO BE LAID ON REAL LIFE APPLICATIONS WHEN FRAMING THE EXERCISES.
2. FITTING
Tools & Equipments – Practice in Filing and Drilling.
Making Vee Joints, Square, dovetail joints, Key Making.
3. CARPENTRY
Tools and Equipments- Planning practice. Making Half Lap, dovetail, Mortise & Tenon joints, a mini model of a single door window frame.
4. SHEET METAL
Tools and equipments - Fabrication of a small cabinet, Rectangular Hopper, etc.
5. WELDING
Tools and equipments - Arc welding of butt joint, Lap Joint, Tee Fillet.
Demonstration of Gas welding, TIG & MIG.
6. SMITHY
Tools and Equipments – Making simple parts like hexagonal headed bolt, chisel.



Swami Vivekanand University, Sagar(M.P.)



3rd Semester



DMNS-0301 Mining-I

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0301	MINING-I	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit: 1

Marks: 14

INTRODUCTION TO MINING INDUSTRY

Types of major minerals, their characteristic features and usages. Geographic locations of major mineral deposits in India, development of mining industry over the years. Major government, semi-government, autonomous and private industries in Mining. Roles and responsibilities of different agencies in mining industry such as Ministry of Mines, State government department of mines, ministry of environment and forest, DGMS, CMRI, Indian Bureau of Mines, Geological Survey of India, etc.

Unit: 2

Marks: 14

ACCESS IN MINES, MODES & SELECTION

Different types of modes of entry in mines. Mine planning and development stages of a mine, selection of modes of access to mines. Modes of entry in the open cast and underground mines. Types: Mine shafts, adit and inclines Characteristic features of modes of entry in mines: support, transport, cables, drainage. Mine shafts: shaft pillars, size of shaft pillars, sinking of a shaft, rope cappel, safety in a shaft.

Unit:3

Marks: 14

DRILLING IN MINES

Drilling in mines, purpose, methods of drilling .Surface drilling, drilling for exploration. Types of drill bits. Drilling for modes of entry, drill pattern.

Unit:4

Marks: 14

EXPLOSIVES & BLASTING

Common explosive bases, Properties of Explosives, High Explosive & Low explosive, their comparison. Permitted explosives their types, composition, properties, uses, advantages & disadvantages. Commonly used explosive in mines. Detonator, common types of detonators, plain detonators, instantaneous and delay action detonators their construction, uses, comparison etc. low tension & high-tension detonators. Safety fuses, detonating cords, detonating relays. Shot firing tools, exploders. Face preparation for shot firing, Preparation of priming charge, charging of hole in coal and drifts, Direct and inverse initiation, shot firing circuits, procedure of shot firing of holes in gassy mine, precautions. Simultaneous & delay firing. Misfires,



causes, remedy and method of relieving, dealing with misfires. Blown out shots & blown through shots. Causes and precautions.

Unit: 5

Marks: 14

INTRODUCTION TO COAL MINING

Main classifications of method of working coal:

- (a) Board & Pillar (b) Long wall.(c) Surface Mining .

Applicability condition for selection of each methods of working. Advantages, disadvantages & simple layout of each method. Unit operations in mining.

RECOMMENDED BOOKS:

1. Elements of Mining Technology D.J.Deshmukh
2. Introduction of Mining Lewis & Clark
3. Drilling Technology Chugh
4. Elements of Mining Arogyaswamy

LABORATORY EXPERIMENTS:

1. List characteristic features and usage of major minerals.
2. Draw geographic locations of major mineral and coal deposits on the map of India
3. Sketch a cross section of different modes of entry in mines.
4. Draw sketch of support used in inclines.
5. Draw a sketch of a rope cappel
6. Sketch different types of drill bits used in mines.
7. Sketch a neat diagram of drill rig arrangement for exploratory drilling
8. Sketch of instantaneous Electric Detonator.
9. Sketch of delay Detonator used for Shot firing in U/G Mines
10. Sketch of different Drill hole patterns used for blasting in coal and stone drifts
11. Sketch of method of Preparation of Priming Cartridge.
12. Draw layout of a board and pillar method of mining.
13. Draw layout of a long wall method of mining.
14. Draw layout of an open cast pit method of mining.



DMNS-0302 Basic Mechanical Engg.

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	T W (B)	MS T (C)		Ma x (E)	Mi n				
DMNS-0302	BASIC MECHANICAL ENGG.	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT-I

Marks: 14

MECHANICAL PROPERTIES & SIMPLE STRESS & STRAIN

Definition of different mechanical properties – elasticity plasticity, ductility, toughness, brittleness, hardness, malleability. Tensile, Compressive & Shear Stress & Strain. Different Elastic Module

DESIGN OF SIMPLE COMPONENT: Cotter joint, knuckle joint, Flange Coupling & Single row riveted joint.

UNIT-II

Marks: 14

HYDROSTATICS

Physical properties of a fluid, Pascal’s law. Calculation of total force & center of Pressure for a rectangular plate.

HYDRODYNAMICS: Continuity equation of flow. Bernoulli’s equation. Venturimeter & its uses. Flow through pipes.

UNIT-III

Marks: 14

BASICS OF THERMODYNAMICS

Properties, Processes, Basic laws of thermodynamics, Thermodynamic cycles. I.H.P., B.H.P., M.M.P., F. H.P. Simple calculations.

STEAM & GAS POWER PLANTS: - Boilers: Basics, Classification and Construction. Boiler Mounting & Accessories. Ranking cycle. Working principles of Turbine, Compressor, Condenser & Pumps

UNIT-IV

Marks: 14

I.C. ENGINES

Auto, Diesel and Dual cycles. Working principles of two stroke & four stroke petrol engine. Working principles of two stroke & four stroke diesel engines

MECHANICAL DRIVES : Fundamentals of Rope, Chain & Belt. Clutch, gearbox, working principle & related simple problems.

UNIT-V

Marks: 14



MATERIAL HANDLING

Types of handling equipment. Determination of handling equipment requirement. Factor affecting the choice of handling equipment.

MAINTENANCE: Maintenance method. Types of maintenance, their importance and field of applications.

RECOMMENDED BOOKS:

1. Text book of hydraulics R.S. Khurmi
- 2 .Text book of thermodynamics R.S. Khurmi
- 3.Text book of design & mechanics of machine R.S. Khurmi
- 4.Text book of Basic Mechanical Engineering R.K. Rajput

LABORATORY EXPERIENCE:

- 1.Study of boiler mountings and accessories.
- 2.Study of Simple & Compound gear trains and calculation of speed ratio.
- 3.Study of Flat and V belts.
- 4.Study of different type of industrial chains and ropes.
- 5.Study of Cutter joint, knuckle joint and different types of Couplings.
- 6.Study of different types of Bolted & Riveted joints.



DMNS-0303 Mining Geology – I

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal			Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	
						Max (A)	Min	TW (B)	MS T (C)	Max (E)		Min	LW (F)			
DMNS-0303	MINING GEOLOGY-1	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit: 1

Marks: 14

GENERAL GEOLOGY :

Introduction : What is Geology ? Branches of Geology, Importance of studying Geology for Mining Engineering students. Brief introduction of solar system. Origin of the earth : Classification of theories into Rotational type & Tidal type, Early theories:- Nebular Hypothesis by Kant, Laplace's corrections over kant's hypothesis Plenetesimal hypothesis by Moulton & Chamberling. Gaseous Tidal hypothesis by Jeans & Jeffereys. Name some very recent theories & their proponents. Age of the earth: - From history & organic evolution, From rate of sedimentation, From salinity of sea water, From rate of cooling, From radiometric dating, Interior of the earth: Crust, Mantle, Core.

Unit: 2

Marks: 14

PHYSICAL GEOLOGY:

Weathering: - Physical & Chemical Weathering, Soil profile, soil types, like Residual and Transported soil, Introduction to work of wind, work of stream, work of sea & Glaciers. Introduction to volcanoes & Earth quakes.

PRIMARY STRUCTURE OR DEPOSITION TEXTURE & STRUCTURES :

Definition, classification into Major & Minor types, significance of studying all such primary features, Why they are called Top & Bottom? Description of different important primary features.

ATTITUDE OF BEDS:

Define-strike, Dip, angle of dip, & direction of dip, initial dip, True dip & apparent dip. Relation between strike & direction at Dip.

Unit: 3

Marks: 14

SECONDARY STRUCTURES:

Folds-what are folds; origin, categories of folds, parts of folds, Nomenclature of different folds, description with three dimensional diagram. Recognition of folds in the field, on geological Map, Underground. Joints:- What are joints, Definition of some important joints. Faults:- What are faults, Distinction between joints & fault, origin, classification, Description of important faults with three dimensional figures. Unconformity:- Different types of Unconformity-Definition with three dimensional sketches.



Unit: 4

Marks: 14

CRYSTALLOGRAPHY & MINERALOGY:-

Definition of crystal & Mineral Classification of crystal systems & classification of Minerals (Preliminary knowledge) Physical properties of Minerals Description of important Rock forming & Economic Minerals in terms of their physical properties & chemical composition.

Unit: 5

Marks: 14

PETROLOGY:

What are igneous, sedimentary, Metamorphic rocks (General definition) Mode of formation of igneous rocks, classification of igneous rocks; Important forms of igneous rocks. Characteristic properties of igneous rocks, effect of igneous injections on sedimentary rocks like coal seams, Mode of formation of sedimentary rocks, Different classes of sedimentary rocks, characteristic properties of sedimentary rocks. Metamorphism & Metamorphic rocks : Characteristic properties of metamorphic rocks Description of Important Igneous, sedimentary & metamorphic rocks (Mega scopic studies only) their uses of & occurrence in India with particular reference to lignite, lime stone, Multi metal & other major minerals occurring in Gujarat & other major mineral deposits of India.

RECOMMENDED BOOKS:

1. General & Engineering Geology Parbin Singh
2. Engineering Geology K. M. Banger
3. 3 Engineering Geology R. S. Khurmi
4. Rutley elements of Minerology H. H. Read
5. Principle of Petrology Tyrell
6. Physical Geology Dutta
7. Textbook of Geology G.B.Mahapatra
8. Igneous & Metamorphic rocks Berry \ Mason
9. Structural Geology M. P. Billings.

LABORATORY EXPERIENCE:

1. Study of Physical Properties of Minerals
2. Determining the Specific Gravity of Minerals by various methods
3. Megascopic studies of igneous Rocks with Tabular Classification
4. Megascopic studies of sedimentary Rocks with Tabular Classification
5. Megascopic studies of Metamorphic Rocks
6. Study and Identification of important Rock forming Minerals in Hand Specimen
7. Study and Identification of important Economic Minerals in Hand Specimen
8. Study and Sketch of Model showing different types of Faults, Folds and their relations to photography



DMNS-304 Surveying -I

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min	LW (F)			
DMNS-304	SURVEYING - 1	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit I

Marks: 14

Introduction

Concept of surveying, purpose of surveying, Measurements: linear and angular, units of measurement, instruments used for taking these measurements. Classification of survey based on instruments. Basic principles of surveying. Chain Surveying Purpose of chain surveying, Principles of chain surveying, Equipment used in chain surveying Viz. Chains, tapes, ranging rods, arrows, pegs, cross staffs, Indian optical square their construction and uses, Different operations in chain surveying: Ranging (direct/indirect), Offset (perpendicular/oblique) Chaining (flat and sloping ground) Conducting chain survey over an area. Recording the field data, plotting the chain survey, conventional sign. Obstacles in chain surveying. Errors in chain surveying. Correction for erroneous length of chain, simple problems. Testing and adjustment chain.

Unit II

Marks: 14

Compass Surveying- I

Purpose of compass surveying. Construction and working of prismatic compass. Use of prismatic Compass, Method of setting and taking observations. Concept of following:

- (a) Meridian - Magnetic, true and arbitrary.
- (b) Bearing - Magnetic, True and Arbitrary.
- (c) Whole circle Bearing and Reduced Bearing.
- (d) Fore and Back bearing.

Unit III

Marks: 14

Compass Surveying-

Local attraction - causes, detection, errors and correction. Problems on local attraction, magnetic declination and calculation of included angles in a compass traverse. Concept of a traverse - Open and closed traverse. Traversing with a prismatic compass. Checks for an open and closed traverse. Plotting of a traverse - by included and deflection angles. Concept of closing error, Adjustment of traverse graphically. Errors in compass surveying. Testing and adjustment of a prismatic compass. Use of surveyor's compass and its construction details, comparison with prismatic compass.



Unit IV

Marks: 14

Leveling- I

Purpose of leveling, concept of a level surface, horizontal surface, vertical surface, datum, reduced level and bench marks, principle and construction of dumpy and I.O.P. (Tilting) levels. Concepts of line of collimation, axis of the bubble tube, axis of the telescope and vertical axis. Leveling staff. (i) Single piece (ii) Folding (iii) ssp with pattern.(iv) Invar precision staff, Temporary adjustment: setting up and leveling, adjusting for parallax of Dumpy and I.O.P. level.

Unit V

Marks: 14

Leveling- II

Differential leveling concept of back sight, fore sight, intermediate sight, station, change point, height of instrument. Level book and reduction of levels by (a) Height of collimation method and (b) Rise and fall method. Arithmetic checks. Problem on reduction of levels. Fly leveling, check. Leveling and profile leveling (L-section and X-section) Errors in leveling, and precautions to minimize them and permissible limits. Reciprocal leveling. Difficulties in leveling Concept of curvature and refraction, testing and adjustment of dumpy and I.O.P. level. Numerical problems.

RECOMMENDED BOOKS:-

1. Arora K.R., *Surveying Vol. I & II*, Standard Book House, Delhi.
2. Kanetkar T.P., *Surveying & Leveling Vol. I & II*, Pune Vidyarthi Griha Prakashan, Pune.
3. Basak P.N., *Surveying & Leveling*, Tata Mc Graw - Hill Publishing Co. Ltd., Delhi.
4. Agarwal G.D., *Surveying Vol. I & II*, Unitech Publishers, Lucknow.
5. Dass G., *Surveying Vol. I & II*, Nav Bharat Prakashan, Meerut.
6. Punmia B.C., *Surveying Vol. I & II*, Laxmi Publications (P) Ltd. New Delhi.

EXPERIMENT:

- (i) (a) Ranging a line.
- (c) Chaining a line and recording in the field book.
- (d) Testing and adjustment of chain.
- (ii) (a) Chaining of a line involving reciprocal ranging
- (b) Taking offsets and setting out right angles with cross staff and Indian optical square.
- (iii) Chain survey of a small area.

Plate -I

- (iv) Chaining a line involving obstacles in ranging. **Compass survey**
- (v) (a) Setting the compass and taking observations .
- (b) Measuring angle between the lines meeting at a point by prismatic compass.
- (vi) Traversing with the prismatic compass and chain of a closed traverse. (Recording and plotting by included angles).

Plate -II

- (vii) Traversing with the prismatic compass and chain of a closed and open traverse. (Recording and plotting by deflection angles).

Plate III

- (viii) Determination of local traction at a station by taking fore and back bearing.
- (ix) To find true bearing of a line at a place.

Leveling:

- (x) To find difference of level between two distant points by taking staff reading on different stations from the single setting.
- (xi) To find difference of level between two points by taking at least four change points .
- (xii) Longitudinal sectioning of a road. **Plate IV**
- (xiii) Cross- sectioning of a road. **Plate V**



DMNS-0305 Applied Civil Engineering

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min	LW (F)			
DMNS-0305	Applied Civil Engg.	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT-I

Marks: 14

FLUID MECHANICS

Definition of fluid, Viscosity, Compressibility and elasticity, Mass density, specific weight, specific volume, specific gravity, Pascal’s law, Types of fluid flow, Basic principles of fluid flow, Continuity equation, Forces acting on fluid in motion, Euler’s equation of motion, Bernauli’s equation, Pressure–Velocity relationship, Applications of Bernauli’s equation, Ventruri meter, Orifice meter, Pitot tube, Reynolds experiment, Laws of fluid friction, Darcy–Weisbach equation, Energy losses in pipes, Simple pipe network calculations.

UNIT-II

Marks: 14

MATERIAL TECHNOLOGY

Bricks – Properties of good bricks, type of bricks, laboratory test on bricks, field test, manufacturing process. Stones aggregates – properties of good building stone, coarse and fine aggregate, grading of aggregate, z modulus, uses of stone aggregates. Cement – Composition properties, types, laboratory and field tests on cement, types and applications cement mortar. Iron & Steel – introduction, types, properties and applications of pig iron, cast iron, wrought iron, mild steel, high carbon steel. Reinforcing steel bars, TMT, HYSD bars. Concrete – classification, strength, properties, types of concrete mix and their applications

UNIT-III

Marks: 14

SOIL MECHANICS

Preliminary definitions, water content, unit weight, specific gravity, void ratio, porosity and degree of saturation, density index. Principal types of soil, soil properties, permeability, soil exploration, bearing capacity of soils. Slope stability analysis. Taylor’s stability number and stability curves, Swedish circle method and friction circle method. Foundation – Introduction to various types of foundations and their applications

UNIT-IV

Marks: 14

R.C.C

Definition, properties and advantages of R.C.C., design of slab, shear stress, bending stress, singly and doubly reinforced beams, T-beam, R.C.C. columns, Types of columns, effective length of a column. Pre-stressed concrete.



UNIT-V

Marks: 14

RAILWAY & ROAD ENGG.

Railway Engg. Alignment and gradient. Rails, sleepers, ballast, fastenings & fixtures, cross section, horizontal & vertical curves, super elevation, transition curves, negative cant. Turnouts, switches, crossings, types of track junctions, maintenance of railway tracks. Road Engg. Classification of roads, width of pavement, camber, gradient, super elevation, speed, sight distance, curves and their radii, road cross section. Preparation of sub-grade and sub-base, stabilized roads, Types of pavements, California Bearing Ratio

RECOMMENDED BOOKS:-

1. Building Construction Sushil kumar
2. Building Material S.C. Rangwala
3. Soil Mechanics S.N. Awasthy
4. Soil Mechanics Dr. B. C. Punamia
5. Fluid Mechanics R. S. Khurmi
6. Estimating and costing B.N. Dutta
7. Hydraulics & Fluid Mechanics Dr. P.N. Modi



DMNS-0306 CAD Practical

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	T W (B)	MS T (C)		Ma x (E)	Mi n				
DMNS-0306	CAD Practica 1	-	2	2	4	-	-	-	-	-	50	15	50	100	3 Hrs	

Unit:1

Marks: 14

STARTING AUTOCAD:

Overview of CAD, Advantages of AutoCAD over Conventional method of drafting.

System requirement, Installing AutoCAD, pointing device (mouse, tablet), Understanding the AutoCAD Interface (Toolbar, Menus), Cursor Menu, the command window, the Text window). Using scripts to run command.

ORGANISING YOUR DRAWING:

Conforming to standards & using different set up methods.

IDEA OF USING COORDINATE SYSTEM:

Using a Coordinate system to specify points, Using Direct distance entry, Shifting and Rotating the Co-Ordinate system. Conforming to standards & using different set up methods.

Unit:2

Marks: 14

IDEA ABOUT CREATING OBJECTS:

Drawing Lines, Drawing curved objects, Creating Point Objects, changing the drawing order of objects, Creating Solid-filled areas, Creating Regions, Hatching Areas, Custom objects and Proxies.

IDEA OF DRAWING WITH PRECISION:

Adjusting snap and grid alignment, Using Ortho mode, Calculating points and values,

Calculating areas, Calculating Distance and Angle, Displaying coordinates & Inquiry methods.

Unit:3

Marks: 14



IDEA OF CONTROLLING THE DRAWING DISPLAY:

Using zoom and pan, using aerial View Using Named View, Using Tiled View ports, Turning Visual Elements On & off.

IDEA OF EDITING OBJECTS: Working with named objects.

USING LAYERS, COLOURS AND LINE TYPES:

IDEA ABOUT ADDING TEXT TO DRAWINGS : Working with Text styles, using line Text, and checking spelling

Unit:4

Marks: 14

IDEA OF DIMENSIONING AND TOLERANCING:

Dimensioning concepts, creating concepts, creating Dimensions, adding dimensions, editing dimensions, Creating dimensions style, Idea of Using style families, using style overrides. Working with Dimension styles, Adding Geometric tolerances. Creating and Modifying arrowheads.

Unit:5

Marks: 14

Section I I : Plane Geometry

Construction and use of scales including diagonal scales . Enlargement and reduction of irregular plane figures . Construction of triangles ,quadrilaterals and polygons . Similar Plane figures , Problems on circles ,tangents and normals . Loci such as the paths of points in simple link mechanism. Methods of construction of ellipse including its elementary properties parabola and rectangular hyperbola ,cycloid (sp.) and involutes curve.

Section I I I : Solid Geometry

Orthographic projection. (Diagrams printed in the question papers may be in either First or Third Angle projection; the projection used will be stated. Solutions in either First or Third Angle projection will be accepted.) Projection involving use of auxiliary planes ; simple problems on auxiliary projection. Simple problems on the intersection of prisms, pyramids , cylinders , right circular cones and spheres .Determination of true length of a line in space : sections and surface developments of prisms , pyramids , cylinders and right circular cones . Isometric and oblique projection without the use of Isometric scale perspective view



Swami Vivekanand University, Sagar(M.P.)



4th Semester



DMNS-0401 Basic Electrical Engineering

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min			LW (F)	
DMNS-0401	BASIC ELECTRICAL ENGINEERING	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

Unit: 1

Marks: 14

FUNDAMENTALS OF ELECTRICAL ENGINEERING

Concept of electric current, potential and potential difference (Voltage). Sources of D. C. and A.C. Electric energy. Methods of voltage generation and standard voltages used in generation transmission and distribution. Electrical Power, energy and their units.

Unit:2

Marks: 14

D.C. CIRCUITS

Ohm's Law, Concept of resistance, conductance, resistivity, conductivity and their units. Effect of temp. on resistance. Temperature coefficient of resistance (Definition only) Connections of resistances. Series, Parallel connections and their combinations. (Simple Numerical) Kirchhoff's Voltage Law, Kirchhoff's Current Law (Simple Numerical)

Unit: 3

Marks: 14

A.C. CIRCUITS

Generation of single phase and three phase sinusoidal voltage. Vector representation. Concept of Cycle, Frequency, time period, amplitude, phase and phase difference. Define instantaneous value, average value, RMS value and peak value of sinusoidal electrical quantities. Derive relationship between them . Form factor and peak factor (Definition only). Current voltage and power in pure resistive, inductive and capacitive circuit. Concept of Reactance , impedance and power factor in R.L., R. C. and RLC Series circuit. (Simple Numerical). Causes and effect of poor power factor. Methods of improving power factor. 3 phase AC supply- three phase three wire and three phase four wire system. Relationship between VL and VPH, IL and IPH and three phase power in star and delta connected load.(Simple Numerical)



Unit: 4

Marks: 14

D.C. MACHINES

Review of concept of Electromagnetism and related laws (Faraday's Law, Lenz's Law, Cork Screw Rule, Fleming's Left Hand & Right Hand Rule.) Construction of D.C. Machines, its main parts and their functions. Classification of D.C. Machines. D.C. Generator : Principle , EMF equation(Derivation and simple numerical), Types of D.C. Generator (No Numerical), Applications of DC generator. D.C. Motor : Working Principle of DC motor, Types of DC motor, significance of back emf, Torque equation(No Numerical). Characteristics of D.C. Series and Shunt Motor. Applications of D.C. Motor. D.C. Motor starter - 3 point starter. Efficiency (No numerical)

Unit: 5

Marks: 14

A.C. MACHINES

Single Phase Transformer: Construction, working principle. EMF Equation (Derivation with simple numerical), Turn ratio, Step up and step down transformers and their application. Losses, efficiency and regulation (No derivation). Three Phase Induction Motor: Construction, types , principle of operation. Concept of Slip (Simple Numerical), Applications, Starters: DOL and Star Delta. Single Phase Induction Motor : Methods of making a single phase motor self start. Types of single phase induction motor- capacitor start, capacitor run and shaded pole and their applications. Synchronous Machines : Synchronous motor- construction, principle of operation, comparison with three phase induction motor. Synchronous generator (alternator) – Construction, principle of operation, speed and frequency, synchronous speed.

RECOMMENDED BOOKS:

1. Fundamental of Electrical Engineering and Electronics – B.L. Thareja , S. CHAND Publication
2. Basic Electrical Engineering – V.K. Mehta , S. CHAND Publication
3. Principles of Electronics – V.K. Mehta , S. CHAND Publication
4. Basic Electrical Engineering – V. N. Mittle, TMH
5. Electrical Machines Vol I & II – S.K.Bhattacharya, TTTI, Chandigarh
6. A Curse book in Electrical & Electronic Measurement and Instrumentation , A.K. Sawhney.
7. Principles of Electrical Engg. and Electronics – V.K. Mehta , S. CHAND Publicat



DMNS-0402 Mine Surveying-I

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal			Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	
						Max (A)	Min	TW (B)	MS T (C)	Max (E)		Min	LW (F)			
DMNS-0402	MINE SURVEYING I	3	1	-	4	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit: 1

Marks: 14

THEODOLITE-I :-

PARTS - Terms used - Temporary adjustments - Tachometers. Measurements - such as ranging, Establishing new station, horizontal angle, vertical angle, bearings, permanent adjustment.

Unit: 2

Marks: 14

THEODOLITE-II :-

Purpose of traversing first, second and third order traverse, closed and open traverse. Included and direct angles, Latitude, Departures, checks-corrections of the traverse- Bowditch rule and transit rule.

Unit: 3

Marks: 14

DIAL SURVEY:-

Miners dial- Dial and telescopic – Miners dial construction - temporary and permanent adjustment. Booking survey –Graphic Method. - Field & line Method. Setting out underground road ways with the help of dial, Plotting by protector, Test for Miners dial, precautions to be taken. Methods used in dial surveying-Loose needle survey-Fast needle survey.

Unit: 4

Marks: 14

USE OF LEVEL IN UNDERGROUND:-

Measuring the depth of shaft and other working, underground bench mark - Datum - determining throw of fault - gradient of underground road. - Measuring subsidence.

Unit: 5

Marks: 14

DIP STRIKE PROBLEMS:-

Determining the true and apparent dip and strike from bore hole data, Determining the deviation in the borehole drilling - Determining the throw of fault and length of drift to cross the fault, Finding out the bearings and dip of various mine working.



RECOMMENDED BOOKS:-

1. Arora K.R., *Surveying Vol. I & II*, Standard Book House, Delhi.
2. Kanetkar T.P., *Surveying & Levelling Vol. I & II*, Pune Vidyarthi Griha Prakashan, Pune.
3. Basak P.N., *Surveying & Leveling*, Tata Mc Graw - Hill Publishing Co. Ltd., Delhi.
4. Agarwal G.D., *Surveying Vol. I & II*, Unitech Publishers, Lucknow.
5. Dass G., *Surveying Vol. I & II*, Nav Bharat Prakashan, Meerut.
6. Surveying Kanetakar
7. Mine Surveying Ghatak
8. U.M.S. I.S.M., Dhanbad

EXPERIMENT:

1. Setting the compass and taking observations .
2. Measuring angle between the lines meeting at a point by prismatic compass.
3. Traversing with the prismatic compass and chain of a closed traverse. (Recording and plotting by included angles).
4. Traversing with the prismatic compass and chain of a closed and open traverse. (Recording and plotting by deflection angles).



DMNS-0403 Mining Geology-II

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	Grand Total (H=D+G)	
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0403	MINING GEOLOGY II	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit: 1

Marks: 14

STRATIGRAPHY:

Physiographic Divisions of India, knowledge of standard Geological time scale including added columns of Indian Equivalent systems (Peninsular & Extra peninsular), the economic importance of Major Indian systems, Important events in Indian subcontinent recorded all through the Geological ages. Definitions of Archean Dharwars, Tertiaries. Archean / Dharwarian / Tertiary stratigraphy of a) Gujarat b) Rajasthan c) Madhya pradesh) Maharashtra.

Economic importance of Archean, Dharwarian, Tertiary rocks of India Stratigraphy of the Gondwana group of rocks/ system, what are Gondwana rocks? Why they are called a group of rocks rather than a system ? Their distribution in India, classification, Gondwana land, full succession of Gondwana Rocks (Table), Description of lower Gondwanas (with special reference to Eastern Indian coal bearing stages), important plant fossils of lower Gondwanas. Economic Importance of Gondwana rocks.

Unit: 2

Marks: 14

ECONOMIC FUEL GEOLOGY:

A. COAL GEOLOGY:

Definition of coal, Rank of coal, whether coal is" Rock or " Mineral, cyclic order of coal formation, pattern of deposition in the Damodar valley Area. Origin of coal In-situ & drift theory with special reference to the origin of coal in the Indian subcontinent Name the places of occurrence of coal. Formation of coal (Brief knowledge) Biochemical stage or Humification process & Geological stage or coalification process. General knowledge of different coal / lignite fields of India.

B. PETROLEUM GEOLOGY:

Properties and origin of petroleum, Trap formation, Introduction of important onshore and offshore oil field of India, Details of oil fields of the chambay-basin and other petroleum resources of Gujarat.

Unit: 3

Marks: 14

OIL MINING:

Methods of Drilling. Primary & secondary methods of oil production.



ORE GENESIS:

Definition of ore, ore mineral, Gangue mineral, Tenor of ore, Metallogenetic epochs & provinces., Process of ore formation Knowledge of all the processes of formation of different Mineral Deposits included under the following four occurrences classes (with special reference to Indian if any)

- (1) Igneous Mineral Deposits
- (2) Sedimentary Mineral Deposit
- (3) Metamorphic Mineral Deposit
- (4) Secondary Enriched Mineral Deposit.

Unit: 4

Marks: 14

ECONOMIC GEOLOGY:

Knowledge of different ore minerals of Important Metals, Use of extracted metals, Rock association of important ore deposits.

Unit: 5

Marks: 14

GEOLOGICAL MAPPING:

Introduction to Topographic maps, Contour maps, Geological maps and various land forms. Brief knowledge of the recognition of the following structures on a geological maps. - Horizontal, inclined, vertical beds. - Folds, faults, unconformity and igneous intrusions.

GEOLOGY: Major rock formations of., Economic geology of with special reference to lignite, oil deposits, limestone & multimetal deposits.

LABORATORY EXPERIENCES:

1. Study of Geological Time Scale.
2. Study of Stratigraphy and rock formation in Gujarat.
3. Study of Classification of Earth Materials, important Ore Minerals, some common Association of Minerals and Rocks with Ores.
4. Study of Geographic, and Geological Classification of Economic Minerals & Rock in India.
5. Study and sketch of Brunton compass and clinometers.
6. Study of Topographical & Contour maps and Sections.
7. Study of various Land Forms.

RECOMMENDED BOOKS:

1. Geology of India & Burma M. S. Krishnan
2. Economic Geology Sen & Ghua
3. India Mineral Resources D. K. Banerjee
4. Mineral Resources & India S. Krishna swamy:
5. Geology of Gujarat (G.S.I. Publication)
6. Ore deposits of India Gokhale & Rao.
7. Introduction to the Geology of coal & Indian coal fields N.L.Sharma & Ram K.S.V
8. Elements of Geological Maps Chadha S. K



DMNS-0404 Mining Machinery

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal	Total (G = E+F)		
						Max (A)	Min	T W (B)	MS T (C)		Max (E)	Min			LW (F)	
DMNS-0404	Mining Machinery	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit:1

Marks: 14

WIRE ROPES

Types of wire ropes- winding, haulage and guide ropes. constructional details of wire ropes; rope laying. Testing of wire ropes: calculation of size of ropes: factor of safety: rope troubles. capping and recapping of ropes. splicing of haulage ropes: factor of safety. Care and maintenance of wire ropes in use and its storage

Unit: 2

Marks: 14

TRANSPORT - MACHINERIES:

Rope-haulages: Different types of haulages, construction, & Operations, (Direct, Endless) Mine locomotives: Diesel, Electric, Battery, & trolley wire, compressed air,- their application - merits - demerits. Diesel locomotive Flame traps - & exhaust conditioner box.

Unit: 3

Marks: 14

Conveyors: Construction & application. Belt:- Their drives, loops take up arrangement, troughed belt, carrying capacity of conveyor, Chain conveyors & shaker conveyors: Scraper chain conveyors armored flexible conveyors, their principle, operation construction & application - merits & demerits.

Unit: 4

Marks: 14

MINE TRACK & SAFETY DEVICES:

Safety systems on haulage roads- including JAZZ rails, back catches. Couplings: Different types of rope coupling, - clips tub couplings. Crossing curves:- Haulage curves, goose neck curves Diamond crossing. General: Description with simple sketches of haulage systems - Numerical problems of different types of rope haulage systems.

Unit: 5

Marks: 14

WINDING



Different type of winders. Head gear: head gear sheave, different type of rope caples , suspension gear, rope caples, safety hooks. Breaks-post brake, cage and its fitting kep gears, rigid & flexible rope guides: suspension of rope guides. Over wind & over speed prevention. Factors governing height of the head-gear: dead load: live load and wind pressure

RECOMMENDED BOOKS:

1. Rutley elements of Minerology H. H. Read
2. Principle of Petrology Tyrell
3. Elements of Mining Technology D.J. Deshmukh
4. Mine Pumps and Haulages S.Ghatak

LABORATORY EXPERIMENTS:

1. Study of different types of rope haulages
2. Study of diesel locomotive flame traps & exhaust conditioner box
3. Study of different types of belt & chain conveyors
4. Study of loops take-up arrangement
5. Study & sketches of various haulage track safety devices
6. Study of various types of rope couplings
7. Study of Ram pump
8. Study of Turbine pump
9. Study of Roto pump.
10. Study of Bore hole pump



DMNS-0405 Surface Mining

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	Grand Total (H=D+G)	
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0405	Surface Mining	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit: 1

Marks: 14

SURFACE MINING:-

Advantages & disadvantages of preliminary evaluations of surface mine project. Pit planning & Design, surface mining methods, choice of machine, systems- Coal/Lignite/ Mineral O.B. Thickness ratio- stripping ratio.

Unit: 2

Marks: 14

MINE DEVELOPMENT:-

Opening out - preparation of haul roads, selection of waste dumping sites etc. box cut and access trenches. Layout and design – bench dimensions, height and width, overall pit slope; stability, general layout of O/C mine. Drainage in pit and slope

Unit: 3

Marks: 14

DRILLING & BLASTING:-

Explosives used in open cast mine. ANFO, SLURRY Explosive, LOX, Emulsion Explosives Formation of Benches, drilling principle, different types of blast hole drills, use of different types of Quarry-Explosives, secondary blasting, problems associated with drilling and blasting.

Unit: 4

Marks: 14

EXCAVATION & TRANSPORTATION:-

Principles of operation of single bucket & multi bucket excavators. Cyclic methods: Shovel-dumpers-pay loaders, drag lines, rippers, scrapper’s continuous methods. Study of above machinery., Conveyors: Stacker Reclaimed- Railway Ropeways, Case studies & layout of dumper shovel combination. Open pit slope stability, Ground water control utilities. Organization structures.



Unit: 5

Marks: 14

OPEN CAST MECHANISATION:

Shovel mining, Dragline Mining, Dumpers, Crushers, Conveyors, Deep hole blasting.

LAND RECLAMATION- Physical restoration of mined out areas. Slope stabilization. Various methods for land reclamation; afforestation crop cultivation etc.

RECOMMENDED BOOKS:

1. Elements of Mining Technology D.J.Deshmukh
2. Surface Mining Technology Samir kumar Das
3. U.M.S.

LABORATORY EXPERIENCES:

1. Study of different types of explosives used in open cast mining.
2. Study & sketch of different types of drilling patterns used in O/C Mines.
3. Study of different methods of secondary blasting.
4. Study of Constructional features & Working methods of Bucket Wheel Excavator.
5. Study of hydraulic excavators & rope shovel.
6. Study of draglines.
7. Study of dumpers.
8. Study of stackers reclaimers.
9. Study of Arial rope ways.



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5th Semester



DMNS-0501 Mining Hazards & Safety

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	Grand Total (H=D+G)	
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0501	MINING HAZARDS & SAFETY	3	1	-	4	70	22	10	20	100	30	10	20	50	150	3 Hrs

UNIT: 1

MARKS: 14

MINE FIRES

Factors responsible for mine fire. Causes of mine fire. Accidental fire, spontaneous heating; factors responsible for spontaneous heating. Incubation period, crossing point, ignition point. Precaution against spontaneous heating. Preventive measures against mine fires. Fire stopping-purpose, constructional details. Opening of a sealed of area

UNIT: 2

MARKS: 14

GAS EXPLOSION

Types of gas explosion. Causes of fire damp explosion. Upper and lower limit of fire damp explosion ; coward's diagram. Precaution against fire damp explosion. Study of some important gas explosion in Indian coal mines.

UNIT: 3

MARKS: 14

DUST EXPLOSION

Upper and lower limit of inflammability of dust. Index of inflammability. Causes of formation of dust and causes of coal dust explosion. Study of some important dust explosion cases in Indian coal mines. Precaution & preventive measures against dust explosion. Stone dust quality of stone dust; stone dusting; stone dust barriers. Water barriers, handling of stone dust. Use of chemicals and chemical foams against coal dust hazards, health hazards due to coal dust. Measurement of coal dust concentration in general body of air.

UNIT: 4

MARKS: 14

INNUNDATION

Sources of dangerous accumulation of water in mines. Factors responsible for inundation in mines. Precautions and preventive measures for inundation. Precaution for approaching water logged areas and working below water logged area. Dams – Purpose, site of dam, types of dam and their constructional details. Study of some important inundation cases in Indian mines.

UNIT: 5

MARKS: 14



MINE RESCUE AND RECOVERY WORK

Rescue apparatus, self breathing apparatus, reviving apparatus, Drager BG – 4 self contained breathing apparatus, Maxaman- reviving apparatus, self contained, self rescuer– Fenzy biocell, Oxybocks, RZ-25, Universal tester for testing of Drager BG-174 and BG-4, Quester-II and Quester-III, , Drager power pump. Rescue stations – equipments used in rescue station, rescue organization and working, training of officials. Method of rescue and recovery work .Emergency organization and rescue plan. Recovery of mines after explosion, fire and inundation Sealing of fire area (u/g fire)

RECOMMENDED BOOKS:

- 1.Elements of Mining Technology Voll-II D.J Deshmukh
- 2.Mine Disaster and Mine Rescue M.A Ramlu

Laboratory Experiences:

1. To study, sketch and explain different types of fire stoppings and their constructional details.
2. To study, sketch and describe about stone dust and stone dust barriers.
3. To study, sketch and describe different types of dams.
4. To visit Rescue Station, study and explain different types of rescue apparatus.
5. To study, sketch and describe First Aid Station and Fresh Air Base.



DMNS-0502 Mine Ventilation

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal	Total (G = E+F)	Grand Total (H= D+G)	
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0502	Mine Ventilation	3	1	2	6	70	22	10	20	100	30	10	20	50	150	3 Hrs

UNIT: 1

MARKS: 14

MINE ATMOSPHERE:

Pollution in mine atmosphere. Mine gases-Origin and occurrence of mine gases. Effects and detection of mine gases. Methane drainage. Monitoring system of mine environment. Analysis of mine air

UNIT: 2

MARKS: 14

HEAT AND HUMIDITY

Heat and humidity in mine atmosphere and their effects. Cooling power of mine air. Assessment of comfort conditions. Air conditioning of mines, surface, underground and divided installations. Spot coolers

UNIT: 3

MARKS: 14

MINE VENTILATION:

Object and standard of ventilation. Degree of gassiness of mines, composition of mine air. Measurement of air quantity, pressure and velocity. Law of air flow in mines, flow of air in ducts and mine roadways, resistance of air ways. Chezy's and Atkinson's equations. Equivalent resistance and equivalent orifice of mine. Regulations related with above topics, ecological and environmental laws related to mines
Mechanical ventilation, different types of fans used in mines, theoretical characteristics of centrifugal and axial flow fans, forcing and exhaust fans, relations between pressure quantity and power of fan, numerical calculation, fan drift, their constructional feature, auxiliary and booster fans, constructional feature, splitting of air current, advantage of splitting, reversal of air current.

UNIT: 4

MARKS: 14

NATURAL VENTILATION



Natural ventilation and its measurements. Thermodynamics of natural ventilation. Distribution and control of air current. Accessories of ventilation used in mines – Door, regulator, stoppings, air lock, air crossing, brattice.

UNIT: 5

MARKS: 14

MINE LIGHTING:

Lighting sources in mines, cap lamps, constructional feature of lamps. Underground lighting. Flameproof and intrinsically safe lighting. Lamp room layout, lamp room organization, care and maintenance of cap lamps.

RECOMMENDED BOOKS:

1. Elements of Mining Technology Vol-2, D. J. Deshmukh
2. Mine Ventilation, G.B. Mishra
3. U.M.S.

Laboratory Experiences:

1. Determination of relative humidity by whirling hygrometer.
2. Study of self contain breathing apparatus Proto-Mark IV.
3. Study & layout of Cap Lamp room.
4. Determination of cooling power of the mine air by using kata thermometer.
5. Measurement of air velocity, quantity and pressure in a duct by using a pitot tube.
6. Study and sketch of air crossing, regulator, Ventilating door, air lock at pit top etc.
7. Study of different types of flame safety lamps and their use for determining CH₄% in a gassy mine.
8. Determination of CO gas in mine working.



DMNS- 0503 Strata Control

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal			End Sem.		Internal	Total (G = E+F)	Grand Total (H= D+G)	
						Max (A)	Min	T W (B)	MS T (C)	Total (D= A+B+C)	Max (E)	Min	LW (F)			
DMNS-0503	Strata control 1	3	1	2	6	70	22	10	20	100	30	10	20	50	150	3 Hrs

UNIT:1

MARKS: 14

SUPPORTS

Timber & Steel supports. Examination of Roof. Roof Bolting. Roof stitching. Cable Bolting. Method of supporting Roadways. Supporting under different Conditions Viz: Pit bottom, crossing , junctions, faulted area, Long wall faces, depillaring areas and stopping areas. Support loads, Systematic Support Rules. Support plan. Support withdrawal.

UNIT: 2

MARKS: 14

POWERED SUPPORTS

Powered supports. Principle of Operation of Power supports. Classification of Power supports. Designation of Power Supports. Major Application of Power supports. Hydraulic fluids.

UNIT:3

MARKS: 14

STOWING

Principal methods of stowing. Their relative merits and applicability. Hydraulic stowing. Pneumatic Stowing. Mechanical Stowing. Hand Packing. Face arrangements. Pipe wear. Pipe Jams.

UNIT: 4

MARKS: 14

STRATA CONTROL

Basic concepts of ground movement.. Rock Pressure due to narrow and wide excavation. Failure of roof and floor. Measurement of Strata movement. Definition of Rock burst, Bumps, Gas outbursts, Pot holes.

UNIT: 5

MARKS: 14

SUBSIDENCE

Basic concept of Subsidence. Damage and loss due to Subsidence. Vertical and lateral movements and their estimation. Angle of fracture and angle of draw. Factors affecting subsidence. Subsidence Control. Protection of surface Structures. Introduction of Protection Pillars including shaft pillars.



RECOMMENDED BOOKS:

1. Strata Control in Mines Chang and Peng
2. Winning and Working of Coal R.T. Deshmukh and D.J.Deshmukh
3. Modern Coal Mining Practices R.D. Singh
4. D.G.M.S. Circulars (Tech.) 1995 Onwards
5. Longwall Mining Syed. S. Chang and Peng

Laboratory Experiences:

1. Study and sketches of temporary lining during shaft sinking.
2. Study and sketches of permanent lining during shaft sinking.
3. Study of drilling & blasting pattern for shaft sinking.
4. Study of different types of special methods of shaft sinking.
5. Sketch and study of different types of blast hole patterns in drift drivage/tunnelling.
6. Study of hydraulic, friction, screw types props and chock release mechanisms.
7. Study of different ways of supporting road way junctions, Measonary, steel, etc.
8. Study of safary supports Roof stietching etc.
9. Study of different types of face advancing supports.



DMNS-0504 Mine Surveying Drawing

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	T W (B)	MS T (C)		Max (E)	Min				
DMNS-0504	Mine Economics	3	1	2	6	70	22	10	20	100	-	-	-	100	3 Hrs	

UNIT: 1

MARKS: 14

Survey Office, Scales, & Mine Models:

- Survey office layout
- Scales & its Classification
- Concept of Mine Models
- Type of models

UNIT: 2

MARKS:14

. Signs & Symbols;

- Drawing Sign & Symbols as given in the II Schedule of CMR-1957.
- Drawing Sign & Symbols as given in the II Schedule of MMR-1961.

UNIT: 3

MARKS: 14

Plotting Of Survey Work;

- Plotting by Scales & Protractor method
- Plotting by Coordinate System
- advantages & disadvantages of both methods their comparison.

Plotting Problem;



-Coordinate system

-Dip.strike.fault

-Borehole

UNIT: 4

MARKS: 14

Plans & sections :

-List of plans & sections

-Preparation of each plans & sections

-Care & maintenance of mines plans.

-Storage of plans & sections

-Preservation of plans

-Keeping of records

-Checking Accuracy of Old Plans.

UNIT: 5

MARKS: 14

Enlargement & Reduction of Plans & sections :

-Method of Enlargement & Reduction of Plans & sections

Different type of instrument uses for Enlargement & Reduction of Plans & sections.



Swami Vivekanand University, Sagar(M.P.)



6th Semester



DMNS-0601 Mine Surveying –II

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam	
		L	T	P		Theory					Practical						
						End Sem.		Internal			Total (D= A+B+C)	End Sem.		Internal	Total (G = E+F)		Grand Total (H= D+G)
						Max (A)	Min	T W (B)	MS T (C)	Max (E)		Min	LW (F)				
DMNS-0601	Mine Surveying –II	3	1	-	4	70	22	10	20	100	30	10	20	50	150	3 Hrs	

UNIT: 1

MARKS: 14

Triangulation:

Introduction-principle-purpose, classification triangulation system-Reconnaissance selection of stations-station map signals well conditioned triangles - base of verification- base of expansions. Forms triangulation - Simple chain triangulation - Double triangles - Theodolites used for triangulation - Base line measurements - corrections, problems based on corrections.

UNIT: 2

MARKS: 14

Tachometric Survey:

Principles of Tachometry - Difference between Theodolite and Tachometer, Tachometer construction stadia rod -common method of Tachometry, Stadia method Tangential method, angular Tachometry, Tachometric constants Numerical problems. Based on various methods - Field work Method of booking - Errors and precision, Auto reduction tachometer - calculations of volume, mineral stock pile - (by taping profile & Tachometric survey)

UNIT: 3

MARKS:14

Setting Out:

Setting out a point of known rectangular coordinates, points for foundation, shaft surveys, selection and fixing of underground stations, difficulties in underground curve laying, Introduction to U/g curves, numerical examples. Giving and maintaining direction and gradient for inclined shafts, slopes, levels and tunnels, maintaining alignment. Auxiliary Telescope-Top and side telescope surveying for open pits.

UNIT: 4

MARKS:14

Underground Survey:

Introduction, purpose, advantages of correlation surveys, Description of methods used in correlation survey, underground traversing and setting of new road ways, Stope surveying- purpose and advantages, Classification of stope surveying-Methods and instruments used.



UNIT: 5

MARKS:14

Astronomy Basic:

Terms and definitions, Determination of true meridian, Latitude and longitude.

Miscellaneous:-

Map projection system, Correlation of mine survey to the National Grid, Gyrotheodolite, Principle photogrammetion and its application in Mining, The role of the mine surveyor and his legal, responsibilities, The provision and maintenance of statutory mine plans, Maintenance of survey instruments.

RECOMMENDED BOOKS:

1. Surveying (Vol-II & III) Kanetakar
2. Mine surveying Agor
3. Surveying Ponamiya
4. U.M.S.
5. Mine surveying (Vol-II & III) S . Ghatak

LIST OF EXPERIMENTS:

5. Setting the compass and taking observations .
6. Measuring angle between the lines meeting at a point by prismatic compass.
7. Traversing with the prismatic compass and chain of a closed traverse. (Recording and plotting by included angles).
8. Traversing with the prismatic compass and chain of a closed and open traverse. (Recording and plotting by deflection angles).



DMNS-0602 Mine Management Safety and Legislation

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DMNS-0602	Mine Management Safety and Legislation	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT: 1

MARKS:14

RELEVANT PROVISIONS OF MINES ACT, 1952

Preliminary Definitions. Mining Boards and committees. Provisions as to health and safety. Hours and limitations of employment. Provisions regarding leaves & wages. Regulations, Rules & by laws .

UNIT: 2

MARKS:14

RELEVANT PROVISIONS OF MINES RULES, 1956

Preliminary Definitions, Committees. Provisions regarding health and sanitation, Medical examination of persons employed, workman inspector and committees. Provisions regarding first aid and Medical appliance. Employment of persons. Provisions as to leave with wages. Welfare committees. Provisions regarding accident, classification as per annexure I and II. Equipments of first aid room and first aid station as per II and III schedule. Abstract of the mines act & rule from (1) to (42) as per V schedule.

UNIT: 3

MARKS:14

RELEVANT PROVISIONS OF COAL MINES REGULATIONS, 1957

Definitions, Duties and responsibilities of persons employed in mines. Provisions regarding plans and sections. Provisions as to mines working. Provisions regarding precautions against danger from fire, dust, gas and water. Ventilation. Provisions as to explosives and shot firing. Miscellaneous provisions as to symbols for mine plan and section, systematic support rules as per II and III schedule.

UNIT: 4

MARKS:14

GENERAL SAFETY IN MINES

Knowledge of vocational training of persons employed in a mine. Refresher course for mining persons. Pit safety committee, formation, function and organizations.



UNIT: 5

MARKS:14

MANAGEMENT

Principles of scientific management. Types of business organizations, organization of Coal India Ltd. Supervision qualities of good supervisors, Leadership, functions of industrial leadership, delegation of responsibility Principles of time study, Trade unions, their functions. Strikes and lockouts.

RECOMMENDED BOOKS:

- | | |
|--|-------------------|
| 1. Mines Act, 1952 up-to-date | DGMS |
| 2. Mines Rules, 1555 up-to-date | DGMS |
| 3. Coal Mines Regulations, 1957 up-to-date | DGMS |
| 4. Legislation in Indian mines- A critical appraisal | Rakesh and Prasad |



DMNS-0603 Underground Mining of Coal

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam	
		L	T	P		Theory					Practical						
						End Sem.		Internal			Total (D= A+B+C)	End Sem.		Internal	Total (G = E+F)		Grand Total (H= D+G)
						Max (A)	Min	T W (B)	MS T (C)	Max (E)		Min	LW (F)				
DMNS-0603	Under Ground Mining of Coal	3	1	2	6	70	22	10	20	100	30	10	20	50	150	3 Hrs	

UNIT: 1

MARKS: 14

PIT TOP AND PIT BOTTOM LAYOUTS

Ideal pit top and pit bottom layout. Tub circuit. Study of pit top and pit bottom lay outs of important U/G mines of India.

UNIT: 2

MARKS:14

BORD AND PILLAR METHOD

Classification of method of working, Conditions for selection of method of working, Board and pillar-applicability advantages and disadvantages, Calculation of percentage of extraction, Design of panel, Different layout classification, SDL chain conveyor layout, Continuous miners, LHD layout, Manpower calculation and OMS, Open & closed panel system. Preparatory arrangements before depillaring, Line of extraction and numbering of pillars, Systematic support rules, Different types of pillar extraction methods Caving, Stowing, Precautions while working near - restricted areas. Working near fire area, Working below waterlogged area, Working below depillared goaf.

UNIT: 3

MARKS:14

LONG WALL MINING

Applicability, Design of long wall panel, Factors affecting length of long wall face, Barrier width, gate road length. Longwall advancing, longwall retreating, cyclic longwall, Non cyclic long wall. Different machines used. Layout of DERD manpower calculation. Thick seam working with long wall top slicing and sub level caving. Long wall caving and stowing.

UNIT: 4

MARKS:14

SUBSIDENCE IN MINING

Theories of subsidence, Different definition related to subsidence, Different factors affecting subsidence, Precautions to be taken on surface in subsidence area , Measurement of subsidence.



UNIT: 5
STOWING

MARKS:14

Hand packing, Mechanical sand stowers. Hydraulic sand stowing- Conditions, suitability, Quality and gathering of sand, Transportation of sand and storage, Mixing chamber and water sand ratio, Stowing practice.

RECOMMENDED BOOKS:

1. Advanced coal Mining B.Singh.
2. Advance coal Mining Tech. Samir Kumar Das.
3. Elements of mining D.J.Deshmukh
4. U.M.S.

LABORATORY EXPERIENCES:

1. Study & Layout of a board & pillar Method of working.
2. Determination of size of panel in board and pillar method.
3. Study & layout of longwall Method of working.
4. Determination of size of panel in longwall method of mining.
5. Determine H.F.L.& gradient line for stowing practice in u/g mines.
6. Study of Stowing Organisation system used in mines.
7. Determination of Percentage extraction of coal in a development area.
8. Layout of hydraulic Mining. Visits Of U/G Coal Mining Field Should Be Arranged.



DMNS-0604 Underground Metaliferrous Mining

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal			Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	
						Max (A)	Min	TW (B)	MS T (C)	Max (E)		Min	LW (F)			
DMNS-0604	under Ground Metaliferrous Mining	3	1	2	6	70	22	10	20	100	30	10	20	50	150	3 Hrs

UNIT: 1

MARKS:14

Introduction to Metaliferrous Mine Working:

Scope & limitations of underground mining, Choice of mode of Entries of underground deposits Adits, Shafts, inclines, combined modes & their applicability number & disposition.

UNIT: 2

MARKS:14

Choice of level interval / back length, shaft station & pocket orebins, waste bins etc, Driving of raises & winzes, Alimake raise climber in cycle of operation

UNIT: 3

MARKS:14

Drop raising using large diameter drill holes, Raise borers, Winzes and pit bottom station method of slope preparation, Open raising method, Compartment method of raising, Drivage of companion level, cross-cut, drift their size shape and position.

UNIT: 4

MARKS:14

Method of Working:

Selection of stopping methods, Classification of stopping methods, various methods of stopping, Underhand, overhand method.

UNIT: 5

MARKS:14

Breast stopping method Shrinkage, stopping method, cut and fill stopping methods, Block caving method, Vertical creator method, Square set stopping method, Sub level stopping method



RECOMMENDED BOOKS:

1. Introduction to Mining Hartman
2. Surface Mining G.B.Mishra
3. Elements of mining (Vol-3) D.J.Deshmukh
4. U.S.M.
5. Metalliferous mining methods Y.P.Checharkar

Laboratory Experiments:

1. Study of Raise drivage methods.
 - (a) Compartment Method.
 - (b) Alimake Raise Climber.
2. Study of development of Metalliferous ore deposits.
3. Study of various Storing Methods.
 - (a) Brest storing method.
 - (b) Under Hand & Over Hand storing method.
 - (c) sub-level Stoping Method.
 - (d) Shrinkage Storing Method.
 - (e) Block Caving Method.
 - (f) Square-set-Timbering Method.

VISIT OF U/G METALLIFEROUS MINING FIELD SHOULD BE ARRANGED



DMNS-0605 Major Project

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min			LW (F)	
DMNS-0604	Major Project	-	-	8	8	-	-	-	-	-	100	50	100	200	200	3 Hrs

Problems related to mine planning will be given during the course work at the start of the term, students will be sent to various mining organizations to collect the data & specifications of machineries from the mine. Some models/charts related to methods of working, Operation of machineries shall also be prepared at institutional level, The students will submit the report. One week will be given for report preparation. The report will be prepared on hard and soft copies. A power point presentation of report should be done during seminar. Technical and new subject should be considered for the projects. Each group of students should be given two to three choices to select the project topic of their interest, Proper guideline and input should be given by the project guide.