SCHEME OF EXAMINATION
& SYLLABUS

of

Diploma in Mining Engineering

UNDER

FACULTYOF ENGINEERING &TECHNOLOGY

Diploma in Mining Engineering
(3YearsProgramme)

SEMESTER-I(Commonforallbranches)						
CodeNo.	**Paper**	**Credits**	**External Marks**	**Practical**	**Internal Marks**	**Total Marks**
DIMI101	CommunicationSkills-I	3	70		30	100
DIMI102	AppliedMathematics	3	70		30	100
DIMI103	AppliedPhysics	3+1	70	50	30	150
DIMI104	AppliedChemistry	3+1	70	50	30	150
DIMI105	EngineeringDrawing	3+1	70	50	30	150
DIMI106	Computer Fundamentals and Applications	2+1	50	50		100
DIMI107	Workshop Practice	1		50		50
	Total	**22**	**400**	**250**	**150**	**800**

Semester-II						
CodeNo.	**Paper**	**Credits**	**Internal Marks**	**Practical**	**End Semester Exam**	**Total Marks**
DIMI201	CommunicationSkills–II	3	30		70	100
DIMI202	ElementsofMiningTechnology	5	30		70	100
DIMI203	ElementsofMine Surveying	5+2	30	50	70	150
DIMI204	EnvironmentalEngineering	5	30		70	100
DIMI205	GeneralWorkshopPractice–I	2		50		50
	Total	**22**	**120**	**100**	**280**	**500**
Semester-III						
CodeNo.	**Paper**	**Credits**	**Internal Marks**	**Practical**	**End Semester Exam**	**Total Marks**
DIMI301	AppliedMechanics	4+1	30	50	70	150
DIMI302	BasicCivil Engineering	3+1	30	50	70	150
DIMI303	BasicMechanicalEngineering	3+1	30	50	70	150
DIMI304	MineEnvironmental Engineering	4	30		70	100
DIMI305	StrataControlandRoof Support	4	30		70	100
	Total	**21**	**150**	**150**	**350**	**650**
Semester-IV						

CodeNo.	Paper	Credits	Internal Marks	Practical	End Semester Exam	Total Marks
DIMI401	BasicElectricalEngineering	4+1	30	50	70	150
DIMI402	AppliedGeology	3+1	30	50	70	150
DIMI403	MineSafetyand Legislation	3	30		70	100
DIMI404	MineSurveying	3+2	30	50	70	150
DIMI405	WiningandWorkingCoal	4	30		70	100
	Total	**21**	**150**	**150**	**350**	**650**

Semester-V

CodeNo.	Paper	Credits	Internal Marks	Practical	End Semester Exam	Total Marks
DIMI501	AdvanceMiningGeology	3+1	30	50	70	150
DIMI502	MineFires,Explosion,Inundation, Rescueand Recovery	3+1	30	50	70	150
DIMI503	WiningandWorkingMetals	3	30		70	100
DIMI504	MineMachineryand Maintenance	3+1	30	50	70	100
DIMI505	DrillingandBlastingpracticesin mines	3	30		70	150
DIMI506P	IndustrialTraining	2			100	100
	Total	**20**	**150**	**150**	**450**	**750**

Semester-VI

CodeNo.	Paper	Credits	Internal Marks	Practical	End Semester Exam	Total Marks
DIMI601	MineEconomicsandBeneficiation	3	30		70	100
DIMI602	Open-CastMiningandLand Reclamation	3+1	30	50	70	150
DIMI603	MineManagementLegislationand GeneralSafety	4	30		70	100
DIMI604	AdvanceMineSurveying	3+1	30	50	70	150
DIMI605	EntrepreneurshipDevelopment	3	30		70	100
DIMI606	MajorProject	6	50		100	150
	Total	**24**	**200**	**100**	**450**	**750**

SEMESTER-I

DIMI101

COMMUNICATIONSKILL-I

UNIT-I

PassageforComprehension:-

(1) Languageof Science
(2) RoboticRevolution
(3) DesigningaCar
(4) NewWondersofcamera
(5) Non-conventionalsourcesofEnergy
(6) OurEnvironment
(7) Entrepreneurship
(8) Safetypractices

UNIT-II

Short-Stories:-

(1) SelfishGiant-OscarWilde
(2) ALettertoGod-GregarioLapexY-FuentesAnastrologer‟sDay–R.K.Naragyan

UNIT-III

AppliedGrammar:-

(1) Determiners
(2) Auxiliaries
(3) Tenses
(4) Passive
(5) Prepositions
(6) Subject-verbAgreement

UNIT-IV

Letter Writing:-

(1) Application(ForJob/Leave)
(2) LetterofEnquiryandreplies
(3) LetterforOrderPlacement
(4) LetterofComplaints(ToEditor/AppropriateAuthorities)

UNIT-V

ReportWriting:-

(1) WritingProgress –Reportofajob
(2) GeneraloutlineforpreparingAProject Report.

ReferenceBooks

1. CommunicationSkillforTeachingStudentsBook-I.M/sSomaliaPublications.Pvt.Ltd., Bhopal.
2. LivingEnglishStructure–W.S. Allen
3. PracticalEnglishGrammar(ExercisesIbyThomson&Martinet)
4. EnglishconversationpracticebyGrantTaylor.

DIMI102

APPLIEDMATHEMATICS

UNIT-I

Algebra-

DeterminantsandMatrices-expansion

Determinants and Matrices-expansion of determinants(upto third order)using sarrusRank, expansion method and pivotal condensation method. Properties of determinants ,solutions of equations (up to 3 unknowns)by Cramers‟s rule. Definition of matrix, addition, subtraction and multiplication of matrices(up to third order).inverse of a matrix byAdjoint methodand elementaryrow transformations. Solution of equations(up to 3 unknowns)byMatrixmethod

UNIT-II

Logarithm-Generalpropertiesoflogarithms
Partialfractions-(linearfactors,repeatedlinearfactors,nonreduciblequadraticfactors)
To resolve properfraction into partial fraction with denominator containing non repeated linear factors to resolve improper fraction into partial fraction

UNIT-III

Trigonometry-Trigonometricratiosofanyanglerelationbetweendegreeandradian Fundamental identities examples based on fundamental identities factorization
Anddefactorizationformulaeinversetrigonometrieratiosvalueofinversetrigonometricratios

UNIT-IV

Vectors - Definition of vector and scalar quantities. addition and subtraction of vectors. Dot product and cros product oftwo vectors.Thumb rule, Anglebetweentwo vectors, application ofdot and cross productin engineering problems
Circle-Equationofcircleinstandardformcentreradiusformdiameterform
General equation of circle

UNIT-V

ComplexNumbers-Definition,RealandImaginarypartsofacomplexnumber,polarandCartesianrepresentation of a complex number and conversion from one to the other, conjugate of a complex number,modulesandargumentofacomplex number.

ReferenceBooks:-

- MathematicsforPolytechnicVolumeI,TTTIPublication
- AppliedMathematics,EEBPublication,Bhopal
- DifferentialCalculus,ByGorakhPrasad
- IntegralCalculus,ByGorakhPrasad
- CoordinateGeometry,By.S.L.Loney

DIMI103

APPLIEDPHYSICS

UNIT-I Units and Dimensions: Physical quantities, Fundamental and derived units, Systems of units (FPS, CGS, MKS and SI units) , Dimensions and dimensional formulae of physical quantities (area, volume, velocity, acceleration, momentum, force, impulse, work, power, energy, surface tension, coefficient of viscosity and strain) Principle of homogeneity , Dimensional equations and their applications, conversion from one unit to another unit for density, force, pressure, work, power, energy, velocity, acceleration , Limitations of dimensional analysis

UNIT-II

Force and Motion: Scalar and vector quantities – examples, addition and multiplication (scalar product and vector product) of vectors. Force, resolution and composition of forces – resultant, parallelogram law of forces. Equilibrium of forces, Lami‟s theorem. Newton‟s Laws of motion – concept of momentum, Newton‟s laws of motionandtheirapplications,determinationofforceequationfromNewton‟ssecondlawofmotion;Newton‟sthird law of motion conversion of momentum, impulse and impulsive forces, simple numerical problems based on third law. Projectile, horizontal and oblique projections and equation of trajectory . Derivation of time of flight,maximum height and horizontal range , Circular motion, Relation between linear and angular velocity and linear acceleration and angular acceleration, Centripetal force (derivation) and centrifugal force, Banking of roads

UNIT-III

Work, Power and Energy: Work: definitions and its SI units, Work done in moving an object on horizontal and inclined plane (incorporating frictional forces). Power: definitions and its SI units, calculation of power in simple cases. Energy: Definitions and its SI units: Types: Kinetic energy and Potential energy, with examples and their derivation, Principle of conservation of mechanical energy (for freely falling boDIECs), transformation of energy from one form to another

Properties of Matter: Elasticity, definition of stress and strain , Different types of modulus of elasticity. Explanation of stress – strain diagram. Pressure – its units, gauge pressure, absolute pressure, atmospheric pressure, Bourdon‟s pressure, manometers and barometer gauges. Surface tension – its units, measurement of surface tension bycapillary tube method, applications of surface tension, effect of temperature and impurity on surface tension . Fluid motion, stream line and turbulent flow, Reynolds number. Viscosity and coefficient of viscosity; derivation of terminal velocity; effect of temperature on viscosity.

UNIT-IV

Waves and vibrations: Generation of waves by vibrating particles , Wave motion with examples, Types of wave motion, transverse and longitudinal wave motion with examples . Velocity, frequency and wave length of a wave (relationship $v = \eta\lambda$). Sound and Light waves. Simple harmonic motion: definition, expression for displacement, velocity, acceleration, time period, frequency in S.H.M. Vibration of cantilever and beam, determination of time period of a cantilever. Free, forced and resonant vibrations with examples

Rotational Motion: Definitions of torque, moment of inertia, radius of gyration, Derivation of rotational kinetic energy and angular momentum, Conservation of angular momentum (qualitative). Theorems of parallel and perpendicular axes

Gravitation and satellites: Kepler‟s law of planetary motion, Newton‟s law of gravitation , Escape velocity (derivation), Satellites, Geo-stationary satellite

UNIT-V

Temperature and its measurement: Principles of measurement of temperature and different scales of temperature, Difference between heat and temperature on the basis of K.E. of molecules, Bimetallic and Platinum resistance

thermometer:theirmeritsanddemerits,Pyrometers–Disappearingfilamentopticalpyrometer

Transfer of Heat: Modes of transfer of heat (conduction, convection and radiation with examples) Coefficient of thermalconductivity,determinationofthermalconductivityofgoodconductor(Searle‟smethod)andbadconductor (Lee‟s disc method) , Properties of heat radiation, Stefan‟s law, Kirchhoff‟s law, Wien‟s law, Planck‟s black body radiation law, Prevost‟s theory of heat exchange

PRACTICAL

1. Tofindthethicknessofwireusingascrewgauge
2. Tofindvolumeofsolidcylinderandhollowcylinderusingavernier caliper
3. Todeterminethethicknessofglassstripandradiusofcurvatureofaconcavesurfaceusinga spherometer
4. Tofindthesurfacetensionofaliquidbycapillaryrisemethod
5. To determine and verify the time period of cantilever by drawing graph between load (w) and depression(D)
6. TodeterminetheatmosphericpressureataplaceusingFortin‟sBarometer
7. Todeterminethecoefficientoflinearexpansionofametalrod
8. TofindthecoefficientofthermalconductivityofcopperusingSearle‟sconductivityapparatus

Tofindthecoefficientofthermalconductivityofbakelitesheet(badconductor)byLee‟sDiscMethod

RECOMMENDED BOOKS

1. AppliedPhysicsVol.I,TTTIPublicationTataMcGrawHill, Delhi
2. BasicAppliedPhysicsbyRKGaur;DhanpatRaiPublications
3. ComprehensivePracticalPhysics -VolumeIand IIbyJNJaiswal;LaxmiPublishers
4. NumericalProblemsinPhysics-Volume IandIIbyRSBharaj;TataMcGrawHill
5. SimpleCourseinElectricityandMagnetismbyCLArora;SChandandCo,NewDelhi
6. FundamentalPhysics-Volume IandIIbyGomberandGogia;PardeepPublications,Jalandhar
7. ATextBookofOpticsbySubramanianandBrij Lal
8. PhysicsLaboratoryManualbyPKPalanisamy,ScitechPublications
9. FundamentalsofPhysicsbyResnickandHalliday,AsianBooksPvt.Ltd.,New Delhi
10. ConceptsinPhysicsbyHCVerma;BhartiBhawanLtd.,NewDelhi
11. AppliedPhysicsVol.I&IIH.C.Saxena&PrabhakarSingh
12. AppliedPhysicsVol.I&IID.Halliday&R.Rasnick
13. EngineeringPhysics–BVNRao
14. PrinciplesofPhysics–K.K. Mohindroo
15. BasicPrinciplesofPhysics–BrijLalSubramanyam.

DIMI104

APPLIEDCHEMISTRY

UNIT-I

Language of Chemistry: Definition of symbol, formula, valency and chemical equation. Writing of the chemical formula of a simple chemical compound. Calculation of percentage composition of a chemical compound,Essentials of a chemical equation, balancing of a chemical equation by Hit and Trial method.

UNIT-II

Chemical Bonding: Electronic concept of valency, Elementary account of electrovalent, covalent and coordinate bond formation on the basis of the electronic concept of valency with the help of suitable examples to each

UNIT-III

Water:Hardandsoft water,types ofhardnessanditscauses,disadvantages ofhardnessof water(i) inindustrialuse (ii) inboilersforsteamgeneration.Methodstoremovehardnessofwater(i)Clark‟sProcess(ii)PermutitProcess (iii) Soda Lime process (iv) Ion-Exchange process. Simple numerical problems related to soda lime process. Definition of degree of hardness of water and the systems to express the degree of hardness of water. Simple numerical problems related to finding the degree of hardness on different scales. Qualities of water used fordrinking purposes, treatment of river water to make it fit for town supply

UNIT-IV

Solutions:Conceptofhomogenoussolution,briefintroductionoftheterms(i)Ionization(ii)Acidity(iii)Basicity (iv) equivalent weight and gram equivalent weight with suitable examples Strength of a solution (i) Normality (ii) Molarity (iii) Molarity as applied in relation to a solution. Simple numerical problems related to volumetricanalysis, Definition of pH, and different industrial applications of pH

UNIT-V

Electrolysis: Definition of the terms: Electrolytes, Non-electrolytes conductors and non-conductors with suitable examples.Faraday‟sLawsofElectrolysis.Simplenumericalproblemsbaseduponthelawsofelectrolysis,Different industrial applications of „Electrolysis‟. Elementary account of (i) lead acid battery and (ii) Ni-Cd battery with special reference to their reaction mechanisms.

LISTOF PRACTICALS

1. Volumetricanalysisandstudyofapparatususedtherein.Simpleproblemson volumetricanalysisequation
2. Preparationofstandardsolutionofoxalicacidorpotassiumdichromate
3. Determinethestrengthofagivensolutionofsodiumhydroxidewiththehelpofastandardsolutionof oxalic acid
4. Determine the strength of solution of HCl with the help of a solution of NaOH and an intermediate solution of standard oxalic acid
5. FindtheamountofchloridesinmgperliterinasampleofH_2Owiththehelpofasolutionof $AgNO_3$
6. Determinethedegreeoftemporaryhardnessofwaterby‟Hehner‟smethod
7. EstimatetheamountofCuinasampleof$CuSO_4$usingastandardsolutionof $Na_2S_2O_3$
8. Estimationofamountofironinhematiteorevolumetrically
9. Estimationoftotalalkalinityofwatervolumetrically
10. Determineconductance,pHofwatersampleusingconductancebridgeandpHmeter

RECOMMENDEDBOOKS

1. ChemistryinEngineeringbyJ.C.KuriacoseandJ.Rajaram;TataMcGraw-HillPublishingCompany Limited, New Delhi
2. Engineering Chemistry by Dr. S. Rabindra and Prof. B.K. Mishra ; Kumar and Kumar Publishers (P) Ltd. Bangalore-40
3. "ATextBookofAppliedChemistry-I"bySSKumar;TataMcGrawHill, Delhi
4. "ATextBookofAppliedChemistry-I"bySharmaandOthers;TechnicalBureauofIndia,Jalandhar
5. EngineeringChemistrybyJainPCandJainM
6. ChemistryofEngineeringbyAggarwalCV
7. ChemistryforEnvironmentalEngineersbySwayerandMcCarty,McGrawHill,Delhi
8. ProgressiveAppliedChemistry–IandIIbyDr.G.H.Hugar;EaglePrakashan,Jalandhar
9. EngineeringChemistrybyO.P. Agrawal.
10. PhysicalChemistrybyGlosstone.
11. OrganicChemistrybySarkarand Rakshit.
12. EngineeringChemistrybyM.M.UppalRevisedbyS.C.Bhatia.
13. ModernTextBookofAppliedChemistrybyP.C.Jain,Dr.G.C.SaxenaandDr.A.K.Goswami.

DIMI105

ENGINEERINGDRAWING

UNIT-I

1. Introduction

- Introductiontodrawingequipments,instrumentsandtheir uses
- PlanningofdrawingsheetasperI.S.696 –1972
- Indianstandardpracticesoflayingoutandfoldingof drawing
- Differenttypesoflinesusedinengineeringdrawing
- Standardpracticeforwritingsinglestrokeverticalandinclinedcapitalandlowercasesletters(practiceto be done on sketch book)
- Standardpracticeofwritingnumerals(practicetobedoneonsketch book)

2. Dimensioningtechniquesandstandardconventions

- IdentificationandrepresentationofvarioussymbolsusedinMechanicalandElectricalDrawing
- DrawingIdentificationandrepresentationofvarioussymbolsofbuildingelements,materialsand sanitary fittings
- Principles,systemandarrangementof dimensioning
- Practiceproblemsofcurrentmethodofdimensioning
-

UNIT-II

1. Formassociatedwithengineeringcurves

- Typesofengineeringcurves
- MethodofconstructionofEngineeringCurves
- PracticeproblemsofdrawingvariousEngineeringCurves.
- ImportanceofscaleinEngineeringdrawing
- Typesofscales-plain,diagonal etc.
- Practicalproblemsforconstructingvarioustypesofscale.

2. Orthographicprojectionofpoints,linesandplanes

- Definitionsofvarioustermsassociatedwithorthographicprojections.
- Planesof projections
- Conceptof Quadrants
- Firstandthirdanglemethodof projection
- ProjectionoflineindifferentpositionswithrespectstoH.P.V.P.andX-Yline
- Projectionofplanesindifferentpositionwithrespecttoreferenceplanes
- Practiceproblemsonprojectionofpoints,linesand planes.

UNIT-III

1. Projectionsofsimplemachinepartsandcomponents

- Procedurefordrawingprojectionsandsectionalviewsof simplemachinecomponents
- Practiceproblemsofsketchinganddrawingtheprojectionsandsectionsofsimplemachine components.

2. Projectionsofsolids

- Typesofsolidsandassociatedterminology
- Positionofsolidwithrespecttoreference planes
- Drawingprojectionsofsolidindifferentpositionwithrespecttoreferenceplanes
- Practiceproblemstodrawprojectionsofsolidindifferentpositions.

UNIT-IV

1. Sectionof solids

- Conceptofsectioningplanes
- Auxiliaryplanesandtrueshapeofsection
- Practiceproblemsfordrawingprojectionsandsectionofsolids**.**

2. Developmentofsurfaces

- Conceptandimportanceofsurfacedevelopmentinengineeringfield
- Developmentofsurfacesforthefollowing
- Cube
- Cylinder
- Prism
- ConeandFrustumcone
- Practiceproblems.

UNIT-V

1. Isometricprojections8

- Limitationsoforthographicprojections
- Definitionsofthetermsaxonometric,oblique,Isometricanddiametricprojections
- Procedureforpreparingisometricoblique
- Isometricviewofgeometricalsolidsandsimplemachineparts
- Practiceproblems.

2. BasicsofCAD

- ComputerhardwareandsoftwarerequirementforCAD
- Co-ordinatesystems
- Set upfora CADdrawing
- Drawingobjectslike-Line,Circle,Arc,Ellipse,RegularPolygons,Polylines,Donutsetc.
- EditingCommandslike-Move,Copy,Rotate,Scale,Fillet,Chamfer,Trim,Extend,Array,Mirroretc.
- Basicdimensioning,geometricdimensioningandtolerance
- UseCADcommandsforsimpleorthographicandisometricdrawings

InstructionalStrategies

- LectureMethod
- Demonstrationanduseofinstrumentusedin drawing.
- Classroompracticesfordifferenttypical exercises.
- Useofcomputerfordevelopingdrawing
- OHPTransparenciesforcomplicateddrawingobjects

Practical

- ProblemsonScalesandLetterings(Onesheet)
- ProblemsonCurves(Onesheet)
- SimpleOrthographicProjections-OneforFirstAngleandOneforThirdAngleProjection(Twosheets)
- Orthographicprojectionswithsections(Onesheet)
- Isometricprojectionfortwoobjects(Onesheet)
- ProjectionofPointsandLines(Onesheet)
- ProjectionofPlanes(Onesheet)
- ProjectionofSolids(Twosheets)
- SectionofSolids(Twosheets)
- Developmentofsurface(Twosheets)
- UseCADfororthographicprojection(Fiveproblems)
- UseCADforisometricprojection(Threeproblems)

ReferenceBooks

1. I.S.696.(Latestrevision),BIS, India
2. EngineeringDrawing,N.D.Bhatt,CharoterPublisher,Anand
3. EngineeringDrawing&MachineDrawing,R.K.Dhawan,Kumar
4. EngineeringDrawing,R.B.Gupta,SatyaPrakashan,Delhi
5. GeometricalDrawing,P.S.Gill,ketson& Sons

DIMI106

ComputerFundamentalsandApplications

UNIT-I

1. INTRODUCTIONTOCOMPUTERS

GenerationsOfComputer-

-First,Second,ThirdandFourth generation.

Classification&applicationsofcomputers-

- Micro,Mini,MainframesandSuper-Computers.
- Applicationsofcomputers.

2. MICROCOMPUTER

Structure&WorkingOfMicroComputers

- CentralProcessingUnit.
- MemoryUnit.
- Input&Output Devices.

EvolutionOfMicro-Computers

- Comparativestudyw.r.t.Micro-processor,clockspeed,databus,Registersize,storagecapacity,peripheral interface of PC to Pentium-IV computer systems.

UNIT-II

1. DATAREPRESENTATION

Data Representation

-Bit,byte,Nibble,Word,DoublewordCodes:ASCII,BinaryCodedDecimal(BCD)EBCDIC,GREYand EXCESS 3 code

.**Number Systems**

-Typesofnumbersystems-Binary,Octal,Decimal,Hexadecimal.

ConversionsOf NumberSystemsAndItsOperations

-Binaryaddition,subtraction

.-BCDaddition, subtraction.

-1'scomplementand2'scomplementmethodsofsubtractionFloatingpointarithmetic.

UNIT-III

1. COMPUTERLANGUAGES

ClassificationAndCharacteristicsOfLanguages

-Machinelanguage.

-Assemblylanguage.

-Highlevellanguage.

-Hardware,SoftwareAndFirmwareComputerHardwareClassificationOfSoftware

2. INTRODUCTIONTODOSOPERATINGSYSTEMS

- **Micro-SoftDiskOperatingSystem(Ms-Dos)**
  -Systemfiles:BIOS,COMMAND.COM,CONFIG.SYS,Autoexec.batfile.
- **MS-DOSCommands**
  -InternalCommands–dir,cd,md,rd,del,ren,date,time, vol.
  AndcopyExternalcommands–attrib,format,edit,find,diskcopy,backup& restore.

UNIT-IV

1.INTRODUCTIONTOWINDOWSOPERATINGSYSTEMS

WindowsOperatingSystem

-ConceptofWindows-Arranging,Moving,Resizing,Opening,andClosingofwindows

.-Folder/FileManagement-Search,copy,deleteandrenamefilesandfoldersWindowsAccessories: Notepad, Word Pad, Pad.

2. COMPUTERAPPLICATIONSSOFTWARE.

- **WordProcessingSoftware**
  MS Word
- **DataAnalysisSoftware**
  MSExcelIntroductiontoElectronicSpreadsheet.
- **PresentationSoftware**
  MSPower Point

UNIT-V

1. INTERNETAPPLICATIONS

IntroductionToInternet-DifferentServicesOfInternet

-www

-Email

-Chat(textual/voice)

-BulletinBoards

-Videoconferencing

-FTP(uploadinganddownloadingfiles)

WEB-SITEACCESSANDINFORMATIONSEARCH

-Browsersandsearchengines.

2. INTERNETCONNECTIVITY

Internet Connectivity

-InternetServiceProvider(ISP)

-Internetaccounts:Shellaccount,TCP/IPISDNandLeasedLine

-Accountanditsfeatures.

HardwareRequired

-MODEMandTerminal Adapters.

-Systemsoftware:O.S.Loader,Linker,Interpreter,CompilerandAssemblerApplicationSoftware.

ListofExperiments/Demonstrations/Tutorials

- StudyOfInputAndOutputDevices
- StudyOfStorage Devices
- PracticeOnInternalAndExternalMs-DosCommands
- PracticeOnWindows95/98/2000

Starting Windows, Exploring the desktop, Arranging windows, My Computer, The start button, Creating Shortcuts, Practice on moving and sizing of windows.

Study of file organization: creating, copying, moving, renaming and deleting. -Practice on Windows Accessories – Notepad, Word Pad and Paint. Editing document & formatting text, Previewing and printing document/Image file. -Practice on Windows Explorer.

Recyclebin,Shuttingdownwindows.

PRACTICEONMS-WORD

Createandformatdocument,

EditandModifytext-changingfontsizetypeandstyle.

AutoText,AutoComplete,AutoCorrect,grammarandspellchecker,Findandreplaceoftext. Open save and print a document.

Insert,modifytable.

PRACTICEONMICROSOFTEXCEL

Create,save&formatworksheet

Open and save worksheet file.

Edit & modify data.

Use formula and functions.
Splitwindowsandfreezepans.
Create,edit,modify,printworksheet/charts.

PRACTICEONPOWERPOINT

Create,edit,insert,move,slides.
Open and save presentation.

Insertpicture,slidelayout,actionbutton. Present slide show.

PRACTICEONINTERNET

IdentificationoftypeofAccount.Connectingtointernet. Dial up access
Web browsing
Searchingwebsites
Email services
Creatingemailaccounts&Receivingandsendingmails

ReferenceBooks

1. IntroductiontoComputers,IindEdition1998,PeterNorton'sTataMcGrawHillsPublishing
2. TheABCsofMs-Office97,IstEdition,GayHart Davis
3. ComputerOrganizationandarchitecture,IVth–Edition1996,WilliamStalling
4. StructuredcomputerOrganization,IIIrd –Edition1997,AndrewsTanenbaumPrenticeHallofIndiaPvt. Ltd, N. Delhi
5. Teachyourself……windows95,Ist–Edition1995,ALStevensComerBPBPublication,N. Delhi
6. TheInternetBook,II–Edition200,DouglasE.PrenticeHallofIndiaPvt.Ltd,N. Delhi

DIMI107

WORKSHOPPRACTICE

1Measurement,Identificationanduseofthevariousmeasuringtools&instruments.

- Linearmeasurementsandmeasuringdevices.
- Angularmeasurementsandmeasuringdevices
- Othermeasuringtoolssuchassurfaceplate,Surfacegauge,plateSafetyindifferentshopof workshops.

2. Woodworking(carpentry shop)

- 2.1Identificationofcarpentrytoolsandtheiruses.
- 2.2Performvariouswoodworkingoperations.

3. Fittingshop.

Identificationofvarioustoolsusedandtheoperationsperformedinfittingshop.
Performvariousfittingoperations.
Markingofjobasperdimensior.
Sawing.
Chipping.
Filling.
Taping.
Reaming.
Drilling.

SmithyShip
identificationofvarioustoolsandequipmentsused&theiruse.
PerformVarioussmithyoperations.
Upsetting.
Drawingdown.
Bending
Settingdown.
Welding.
Cutting.
Punching.
Fullering.

4. Sheetmetal.

Identificationanduseofthevarioustools.
Performvarioussheet-metaloperations.
Shearing
Bending
Drawing
Squeezing.
Markingon sheet
Snipping.
Grooving

5 WeldingShop

Identificationanduseofthevarioustoolsandequipments.
Performthearcweldingandgasweldingoperations.
PerformthesolderingandBrazingoperations.

6 Machineshop

Identificationanduseofthevarioustoolsandequipments.
Classificationoflatheandoperationoflathe.
Plane turning
Taperturning
Treading

Drilling
Variousattachmentusedinlathe.

ReferenceBooks

(1) WorkshopTechnology(Vol-1)Hazra&choudhary.
(2)WorkshopTechnology–(Vol-1&2)Chapnan(3)Manufacturingprocess(Vol-1)Delela(4)Materialsand Manufacturing
Lindberg processes.

SEMESTER-II

DIMI201

COMMUNICATIONSKILLS- II

CourseObjective-
Language is the most commonly used and effective medium of self-expression in all spheres of human life – personal, social and professional. A student must have a fair knowledge of English language and be able to pursue the present course of study and handle the future jobs in industry. The objective of this course is to assist the diploma holders to acquire proficiency, both in spoken (oral) and written language. At the end of the course, the student will be able to develop comprehension, improve vocabulary, develop grammatical ability, enhance writing skills, correspond with others, enhance skills in spoken English.

DETAILEDCONTENTS

Unit-I
ProseText Book
ThefollowingsixchaptersofABookofEnglishpublishedbyMcmillionIndia

UnclePodgerHangsaPicture
Subash Chandra Bose
A Pair of Mustachios
Guru Gobind Singh
WithThePhotographer
SirJagdishChandraBose

Therewillbeonegeneralquestionfromoneofthesesix chapters.
Precisewriting(selectedfromtheprescribed6chaptersofProseTextBook)

Unit-IIGrammar
- Antonymschangeofwordsintodifferentpartsofspeech
- Correspondence

Businessletterssuchas:
Registration as supplier
Floatingquotationsandtenders
Quarryforproductspecification,priceandotherdetailsetcfromafirm/Company Covering letter for quoting prices against a quotation/tender
Placingsupplyorder
- Note-Making
- InterviewSkills

Unit-III
Officialletterssuchas:
- Lettertoeditorforplacinganadvertisementinthenewspaperforpurchase/sellingofgoods
- LettertoGeneralManager,TelephoneDepartmentforrestoringadeadtelephone/shiftingatelephoneLetter to Municipal Commissioner for improving water supply/ sanitation system in your locality
- LettertoStateElectricityBoardforrepairofstreetlighting/correctionofbills etc.
- Lettertothesupplierforrectifyingorreplacingadefectivemachinery/itemofpurchase
- Letter to Registrar, State Board of Technical Education for allowing to improve grades/marks in diplomaexamination

Unit-IV

- Report Writing
- Draftingatechnicalreportofavisittoafactory,constructionsite,modernoffice, etc.
- Reportwritingoncurrentgeneralthemes/topicsrelatedtoeconomy,industry,social issues
- Elementsofperiodicalprogressreport
- InspectionNote
- Writeaninspectionnoteafterinspectingtechnical/industrialgoods
- Writeaninspectionnoteaftervisitingaconstructionsiteorproductionshop
- Writing“Preface”and“acknowledgement”ofaprojectreportAparagraphoncurrenttopics/themes

Technology
Science
Economy
Politics
Social
General

- Drafting
- Pressnotes
- Memos/circulars
- Notices(lostandfound:obituary/auction,etc)
- Telegrams
- Pressreleases
- Agendaandminutesofthemeeting
- Personalresume/curriculumvitae

Unit-V
CommunicationTechniques

- Importanceofcommunication
- Typesofcommunication–verbalandnon-verbal
- Onewayandtwo-waycommunication
- Processofcommunication–horizontal,vertical,upward,downward
- Essentialsofgood communication
- Levelofcommunication–interandintrapersonal,grouptoperson,groupto group
- Methodsofeffectiveoral,writtenandnon-verbalcommunication,Horizons–tone,frequency,rate,volume, depth
- Barriertocommunicationandovercomingbarriers
- Listeningskill
- Useofaudiovisualaidsforeffective communication

Reference Books
Essentials of Business Communication by Pal and Rorualling; Sultan Chand and Sons
TheEssenceofEffectiveCommunication,LudlowandPanthon;PrenticeHallofIndia
NewDesignEnglishGrammar,ReadingandWritingSkillsbyALKohli(CourseAandcourseB),Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,
New Design English Readingand AdvancedWritingSkillsforClass XIandXIIbyMK Kohli and ALKohli; Kohli Publishers, 34 Industrial Area Phase-II, Chandigarh,
APracticalEnglishGrammarbyThomsonandMarlinet
SpokenEnglishbyVSasikumarandPVDhamija;TataMcGrawHill English
Conversation Practice by Grount Taylor; Tata McGraw Hill
DevelopingCommunicationSkillsbyKrishnaMohanandMeeraBanerji;MacMillanIndiaLtd.,Delhi
BusinessCorrespondence andReport Writing by RCSharmaand KrishnaMohan; Tata McGraw HillPublishing Company Ltd. New Delhi
CommunicationSkillsbyMs.RDattaRoyandKKDhir,VishalPublication,Jalandhar

CourseOutcome–

1. Studentswillbebetterequippedintheskillsessentialforeffectivecommunication.
2. Thiscoursewillinstructstudentsaboutthein-depthknowledgeofcareerorientedcommunication.

DIMI202

ELEMENTSOFMININGTECHNOLOGY

UNIT– 1INTRODUCTION

HistoryofminingIndustryandmineralwealthofIndia.Specially relatedwithChattishgarh. Selection of site for opening amine

MODESOF ENTRY

Different types of modes of entry. inclined, shaft,audit.Condition suitable to selection of a suitable mode ofentry.Factors governing, shape, size and site of modes ofentry.Compressions, suitability and advantages of each type of mode ofentry.

UNIT–2SINKING OPERATIONS

Sinking ofshaft in a normalcoalstrata.Marking of centre ofshaft.Temporary supports/lining permanentlining.Firing shots in sinkingshaft.Introduction of special methods of shaftsinking.

UNIT–3DRIFTINGAND TUNNELING

Introductionabout drifting andtunneling.Methods of drifting andtunneling.Manual methods of drifting andtunnelingMechanized methodsofdrifting andtunneling.Ventilation drilling , blasting andmucking.Transportationsystems indrifts andtunnels.

UNIT -4INTRODUCTIONTOMETHODSOF WORKING

Opencastminingconditionsuitableforlimitofquarryingadvantageanddisadvantage ManualQuarrying,layouts.Semimechanizedandmachinesused,layouts,andrelatedregulation. Introductiontodifferentmethodsofcoalmining,Bordandpillarmethodof working,conditionsuitableforgenerallayouts,percentageofextraction,development,preparationfor depillaring , depillaring operation, related regulation.

Longwall methods of working suitability,favorable condition, longwall advancing method,layoutsof single unit anddouble unit longwallface.Longwall retreating method, layout of single unit and double unit faces, relatedregulation.

REFERENCEBOOKS:

Sl.No.	Title	Author,Publisher, Edition &Year
1.	MiningEnvironment andVentilation	G.B.Mishra
2.	SelectionInstallation&Maintenanceofmine pumps.	Rakesh&Lal
3.	Elements of MiningTechnologyVolI&II	D.J.Deshmukh
4.	izkjafEHkd[kfudeZ	ch0ds0flag

DIMI203

ELEMENTSOFMINESURVEYING

DETAILEDCOURSECONTENTS:

UNIT-1: INTRODUCTION

Introduction tosurveying, Definition and object ofsurveying Primary division ofsurveyClassification ofsurveyPrinciples ofsurveyingLinearmeasurementsAngularmeasurement Units of measurements, Linear andAngularPurpose of survey,degree of precision requiredforthepurpose;nature andextent of survey, sources of error, time available for both field and office work, cost forsurvey.
Measurementsofdistances

A) Methodsofdeterminingthedistances.

(i)Direct(ii)Commutativemethods.

B) Directmeasurements-methodsandinstrumentsusedformeasuringdistance.
C) Pacing,Passometer,Pedometer,Odometer,Speedometer,Perambulator,Judgingdistance, Timemeasurement.

UNIT–2:CHAIN SURVEYING

Purpose of chain surveying, principles of chain surveying.Equipments used in chain surveying. chain, tapes, ranging rods, arrows, pegs, mallet, cross, soptical square, construction of optical squar and uses.Different operations in chain surveying, ranging-direct and indirect, chaining on flat andslopping ground, offsetting perpendicular and oblique.Conducting chain survey over the given area.Recording field data.Plotting the chain survey.Conventional signs Obstacles in chaining.

Errorsinchainsurveying.Correctionsforin-correctlengthofchain.

Simple examples oncorrections.Test and Adjustments ofchain.

UNIT–3:COMPASS SURVEYING

Purpose of compasssurveying.Construction and working of prismaticcompass.Uses of surveyors and prismatic compass, Constructional details ofsurveyor's compass.Setting up the compass and takingobservationsConceptof(i)Meridians;true,Magneticandarbitrarymeridians(ii)Bearings-True, Magnetic and arbitrary, magnetic dip and declination.Systems of measuring the bearings - whole circle bearing, reducedbearing (Q.B.), numerical problems on conversions ofbearing.Fore bearing back bearing of aline.Concept of a traverse - open and closedtraverse.Traversing with prismaticcompass.Local attraction causes detection error andcorrections.Local attraction causes detection error andcorrections.Checks for and open and closedtraverse.Calculation of includedangles from bearing. Problems on effect oflocal attraction.Closing errors, plotting a traverse by included angles and deflectionangles method.Error, precautions and adjustments in compasssurveying.

UNIT-4:PLANETABLE SURVEYING

General Introduction Purpose of plane table surveying. Equipments used in plane table surveying, plane table. Alidade - plane and telescopic.Operation of plane table, centering, leveliorientation.Importantprecautionswhileplanetablesurveying.Introductionaboutmethods

ofplanetablesurvey:(i)Radiation(ii)Intersection(iii)Traversing(iv) Resection.
Advantages and disadvantages of plane table surveying.

UNIT-5:COMPUTATIONOFAREASANDVOLUMES

ComputationofareasandvolumeofIrregularshapesbySimpson'sRuleandbyBowdichRule.
CalculationofVolumeofHeaps.

LISTOFPRACTICALS/TUTORIALS:

1. Tolayachainlineinthefield.
2. Torangeachainlineby3rangingrodsystemandcheckingitwiththeLineranger.
3. Totakeoffsetsbytapeoneithersideofachainlinebyswingingmethodanditsbooking.
4. TotakeoffsetsbyOpencrossstaffandcheckingitsaccuracybyOpticalsquare.
5. Toconductachaintriangulationsurveyofanareabyerecting -(a)Baseline(b)Checkline(c) Type line and its plotting.
6. ToPerformthetemporaryadjustmentsofaPrismaticcompassandtakingbearingsofgiven lines.
7. Toconductcompasstraversesurveyforclosedtraverse,takingforebearingandback bearing of each line and calculation ofIncluded angles.
8. Toconductaplanetablesurveyby-(i)Radiationmethod(ii)Intersectionmethod (iii)Traversingmethodandcalculationofareabyvariousmethod.

ReferenceBooks:

Sl.	Title	Author,Publisher,Edition&Year
1.	Surveying&Leveling,Vol-I	Kanetkar&Kulkarni
2.	AdvanceSurveying	Alamchand
3.	Surveying,Vol-I	B.C. Punamia
4.	MineSurveying, Vol-I&II	S. Ghatak
5.	Surveying,Vol-I	Arora

ENVIRONMENTENGINEERING

UNIT-I

INTRODUCTIONANDGLOBALWARMING

The Environment, the impact of human being upon the environment, the impact the Environment upon human beings, Improvement of Environment quality, the role of the Environmental engineer. Global warming – reasons.

AIRQUALITY:DEFINITIONS,CHARACTERISTICS&PERSPECTIVES

Air pollution-Historical overview, global Implication of Air pollution, Units of measurement, sourcesof pollutants.

CLASSIFICATIONOFPOLLUTANTS–Particulates,hydrocarbons,

carbon monoxide, Oxide of Sulpher, Oxides of Nitrogen, photochemical oxidants, Indoor air pollution Measurements of above pollutants.

Airqualitymanagementsconcepts.

UNIT-II

METROLOGYANDNATURALPURIFICATIONPROCESS

Elemental properties of the atmosphere – Scales of motion, Heat pressure, wind, mosture, Relative humidity.Devices used for the measurement of above properties.Influence of Metrological phenomena on air quality & dispersion, pressure system&DispersionWinds&dispersionmoistureanddispersion,modeling. Effects of Air pollution metrological conditions-changes on the Mesoscale& Mircroscale, changes onMicroscale.

ENGINEEREDSYSTEMSFORAIRPOLLUTION CONTROL

Atmospheric cleansing processes, Approaches to contaminant control. Central devices for particulate contaminants Gravitational settling chambers, centrifugal collectors, wet collectors, Fabric filters (Baghouse filters) Electrostatic precipitators (ESP) control devicesforgaseouscontaminants-absorption, condensation, combustion, Automotive emission control.

UNIT-III

ENGINEEREDSYSTEMSFORRESOURCEANDENERGYRECOVERY

Processing techniques – Mechanical size alteration, Mechanical component separation, Magnetic & Electromechanical separation, Drawing and Dewatering. Materials recovery systems – Materialsspecifications, processing and recovery systems.Recovery of biological conversion products-Composting (Aerobic conversion), Anaerobic Digestions.Recovery of Thermal conversion products – Combustion of waste materials, Incineration with heat recovery, use of refuse Derived fuels (RBF), Gasification, pyrolysis.Recovery of energy from conversion products energy – Recovery systems, Efficiency-factors, Determination of energy output and efficiency.Materials and energy-Recovery systems.

NOISEPOLLUTIONANDCONTROL

Sources of noise pollution, control of noise pollution, unit of noise measurement, Noise intensity level-allowable limit for different situations. Noise measurement, The problem of noise pollution and legal measures for it's control.

UNIT-IV

INDUSTRIALWASTES

Industrial Waste treatment – Economics of waste treatment benefits of pollution abatement (primary, secondaryand intangible benefits),difficulties in achieving, pollution abetment through industrial waste treatment, theories of waste treatment of specific – industrial waste such as textile, dairy paper andpulp, and distillerywaste.

ENVIRONMENTALANDPOLLUTIONCONTROL LAWS

Air (prevention and control of pollution) Act, 1981 and Air (prevention and control of pollution Rules 1982-short title, extant and commencement, definitions. The environment (Protection) Act 1986-short title, extent and commencement Definitions-Measures to protect and improve environment.

UNIT-V

Air Pollution from thermal power plants, Nuclear power plants, Fertilizer and chemical plants, Acid rain, Methods of prevention

WATERCONTAMINATIONINOCEAN –Reasons,it'seffects,method of prevention.

REFERENCE BOOKS

1. AirpollutionbyPerkins.
2. Liquidwasteofindustry,theories,practicesandtreatmentbyNelsonL.Vamerow.
3. ManagementofsolidwasteindevelopingcountriesbyFlintoff.
4. EnvironmentalEngineering(Internationaledition)byPeavy,Howards.(McGrawHSeriesin Environmentalengineering)
5. AirPollution–It'soriginandcontrolbykenethworkandWarmer.(W.H.O.Publication)
6. industrialwastebyNamit.
7. ThermalEnvironmentbyburgess H.Jennings.
8. Environment&PollutioncontrollawbyVijayMalik(EBCpublishingPvt.Ltd.)Lucknow.
9. Environmentprotection-Problems,Policiesadministration,LaweditedbyParasDiwanDeep&DeepPublications.

GeneralWorkshopPractice-I

RATIONALE

In order to have a balanced overall development of diplomaengineers, it is necessary to integrate theory with practice.General workshop practices are included in the curriculum in order to provide hand on experience about use of different tools and basic manufacturing practices. This course aims at developing general manual and machining skills in the students. Besides above, the development of dignity of labour, precision, safety at work place, team working and development of right attitude are the other objectives.

DETAILEDCONTENTS(PRACTICALS)

Note:The students are supposed to come in proper workshop dress prescribed by the institute. Wearing shoes in the workshop(s) is compulsory. Importance of safety and cleanliness, safety measures and upkeep of tools, equipment and environment in each of the following shops should be explained and practiced.

Thestudentsshouldpreparesketchesofvarioustools/jobsintheirpractical The following shops are included in the syllabus:

1. CarpentryandPaintingShop-1
2. FittingShop
3. WeldingShop-I
4. ElectricShop–I
5. SmithyShoporElectronicShop-I
6. SheetMetalShop

Note:

1. Thebranchese.g.CivilEngineering,ElectricalEngineeringandAutomobileEngineering, will do Smithy Shop instead of Electronic Shop- I
2. Thebranchese.g.ElectronicsandCommunicationEngineering,ComputerEngineering and Information Technologywill do Electronic Shop-I instead of Smithy Shop. 26

1. **CarpentryandPaintingShop-I**

IntroductiontovarioustypesofwoodsuchasDeodar,Kail,Partal,Teak, Mango, Sheesham, etc.(Demonstration and their identification).

Demonstration,functionanduseofcommonlyusedhandtools.Care, maintenanceoftoolsandsafety measures to be observed.

JobIMarking,sawing,planningandchiseling&theirpractice(sizeshouldbementioned)
Introductiontovarioustypesofwoodenjoints,theirrelative advantagesanduses.

JobIIPreparationofhalflapjoint

JobIIIPreparationofMortiseandTenonJoint
Demonstrationofvariousmethodsofpaintingwoodenitems.

JobIVPreparationofwoodensurfacebeforepaintingincludingprimercoating

JobVPaintingPracticebybrush/spray

Job VI Preparation of surface, before Painting such as cleaning, sanding,putty. Procedure and application of primer code and painting steel items.

Safetyprecautionsincarpentryshop

2. **FittingShop**

Introduction to fitting shop tools, common materials used in fitting shop,Identification of materials. Such as Steel, Brass, Copper, Aluminium etc.Identification of various sections of steel such as Flat, Angle, Tee,Channel,Bar Girder, Square, Z-Section, etc.

Description and demonstration of various types of work benches, holdingdevices and files. Precautions while filing.

Description and demonstrationof simple operation of hack-sawing,demonstration and description of various types of blades and theirspecifications, uses and method of fitting the blade.

JobIIFilingadimensionedrectangularorsquarepieceofanaccuracyofr 0.5mm

JobIMarkingofjob,useofmarkingtoolsandmeasuringinstruments.

JobIIFilingadimensionedrectangularorsquarepieceofanaccuracyofr 0.5mm

JobIIIFilingpractice(productionofflatsurfaces).Checkingbystraightedge.
JobIVMakingacutout fromasquarepieceofMSFlatusinghandhacksaw.

Care and maintenance of measuring tools like calipers, steel rule, try square,vernier calipers, micrometer, height gauge, combination set. Handling ofmeasuring instruments, checking of zero error, finding of least count (allgauges including dial gauge).27

3. **WeldingShop**–I

(a) Introduction to welding and its importance in engineering practice; types ofwelding; common materials that can be welded, introduction to weldingequipment e.g. a.c. welding set, d.c. rectifier, electrode holder, electrodesand their specifications, welding screens and other welding relatedequipment, accessories and gloves.

(b) Safetyprecautionsduringwelding

(c) Hazardsofweldinganditsremedies

Electric arc welding, (a.c. and d.c.) precautions while using electric arc welding, Practice in setting current and voltage for striking proper arc. Earthing of welding machine.

JobIPracticeofstrikingarcbendingandtackingwhileusingelectricarcweldingset.
JobIIWeldingpracticeonelectricarcweldingformakinguniformandstraightweldbeads
Varioustypesofjointsandend preparation.
JobIIIPreparationofbuttjoint byelectricarcwelding.
JobIVPreparationoflapjoint byelectricarcwelding.
JobVPreparationofcornerjoint byusingelectricarcwelding.
JobVIPreparationofTeejointbyelectricarcwelding.

4. **ElectricShop–I**

Study, demonstration and identification of common electrical materials suchas wires, cables, switches, fuses, ceiling roses, PVC Conduits, PVC Channelsand allied items, tools along with electrical instruments such as voltmeter,ammeter and multimeter.

Study of electrical safety measures and demonstration about use of protective devices such as fuses, MCBs, ELCBs and relays including earthing.

Job I Identification of phase, neutral and earth of domestic appliancesandtheir connection to two pin/three pin plugs.
Job II Preparation ofa house wiringcircuit on wooden board usingfuse, switches, socket, holder, ceilingrose etc. in PVC conduitand PVC casing and capping wiring system.

Studyof common electrical appliances such as electriciron, electric kettle,ceilingfan,tablefan, electricmixer, electric Geyser, gas geyser, desertcooler, refrigerator, water purifier

Introductiontolead-acidbattery,identificationofpartsanditsworking.
Job IIIInstallation of inverter with battery and to connect two or morebatteries in series and in parallel (knowledge of a.c. and d.c.)
JobIVChargingofabatteryandtestingitwiththehelpofhydrometerandcelltester28

5. **SmithyShop**

Demonstrationanddetailedexplanationoftoolsandequipmentused.Forgingoperationsinsmithyshop.

Safety measures to be observed in the smithy shop.

Demonstrationanddescriptionofbendingoperation,upsettingoperation,descriptionandspecificationof anvils, swage blocks, hammers etc.

Demonstrationanddescriptionoftongs,fullers,swages etc.
Job I ToforgeaL-hook.
Job II Toprepareajobinvolvingupsettingprocess
JobIIIToforge achisel
JobIVTopreparеacubefromaM.S.roundbyforging method.

6. **SheetMetalShop**

Introduction to sheet metal shop, use of hand tools and accessories e.g. differenttypes of hammers, hard and soft mallet, sheet and wire gauge, necessary allowancerequired during job fabrication, selection of material and specifications.

Introductionanddemonstrationofhandtoolsusedinsheetmetal shop.

Introductionanddemonstrationofvariousmachinesandequipmentusedinsheetmetalshope.g.shearing machine, bar folder, burring machine, powerpress, sheet bending machine.

Introductionanddemonstrationof variousrawmaterialsusedinsheetmetalshope.g.M.S.sheet, galvanized-iron plain sheet, galvanised corrugated sheet, aluminium sheets etc.

Studyofvarioustypesofrivets,steelscrewetc.

Job I Shearingpracticeonasheetusinghand shears.

a) Practiceonmakingsinglerivetedlapjoint/doublerivetedlap Joint.

b) Practiceonmakingsinglecoverplatechaintype,seamjointand riveted butt joint

ReferenceBooks:

1. WorkshopTechnologyI,II,III,bySKHajra,ChoudharyandAKChaoudhary.Media Promoters and Publishers Pvt. Ltd., Bombay
2. WorkshopTechnologybyManchandaVol.I,II,IIIIndiaPublishingHouse,Jalandhar.
3. ManualonWorkshopPracticebyKVenkataReddy,KLNarayanaetal;MacMillan India Ltd. New Delhi
4. BasicWorkshopPracticeManualbyTJeyapoovan;VikasPublishingHouse(P)Ltd., New Delhi
5. WorkshopTechnologybyB.S.Raghuwanshi,DhanpatRaiandCo.,New Delhi
6. WorkshopTechnologybyHSBawa,TataMcGrawHillPublishers,New Delhi.

SEMESTER-III

DIMI301

AppliedMechanics

DETAILEDCONTENTS:

UNIT–1FundamentalConcepts

- DefinitionofMechanics,Statics,Dynamics,Kinetics,Kinematics.
- Conceptofspace,mass,particle,body,rigid body.
- Scalar,vector,fundamentalunits,derived units.

Composition&ResolutionofForces

- Force-concept,definition,unit,graphicalrepresentation.
- Conceptofsystemofforces-non-coplanar,coplanar,concurrent,non-concurrent&parallel forces.
- Composition&Resolutionofforces.
- Freebodydiagrams, lawofparallelogram,Varigonon's theorems.
- EquilibriumofCoplanarconcurrentforces,parallelforces&non-concurrentforces, Lami‟s Theorem.
- Moment of aforceand Couple.

UNIT–2:Centroid&MomentofInertia

- Locationofcentroidandcenterofgravity.
- Centroidof regularplaneandcompound areas.
- Centerofgravityof simple solids.
- MomentofInertiaof plane areas.
- Perpendicular &Parallel.Axes theorems.

Friction

- Rough&Smoothsurfaces,conceptof friction.
- Typesoffriction,Coloumb'slawoffriction,Co-efficientoffriction,angleoffriction,angle ofrepose.
- Frictiononinclinedplane,Screw andNutfriction.
- Ladderandwedge friction.
- FrictioninJournal bearings
- Method ofreducingfriction.

UNIT–3:Work,Power&Energy

- DefinitionandunitofWorkdone,PowerandEnergy.
- Formsof Energy-KineticandPotential Energy.
- PrincipleofConservationofpowerandenergy.
- Powerofengine andpumps,meaneffectivepressure,powermeasurement.
- RelationbetweenHeat&Mechanicalwork,relationbetweenElectrical&Mechanicalenergy.

Kinematics

- Kinematics inCartesian andpolar coordinates.
- Conceptofspeed,velocity,acceleration,radialandtransversevelocity,particleunder uniformandnon-uniformacceleration,tangentialandnormalacceleration.
- Angulardisplacement,AngularVelocity,AngularAcceleration.
- Motion under gravity.

UNIT4:Kinetics

- ✍Kineticsofparticle,motionunderconstantforce,Newton"sLawsofMotion.
- ✍Momentumandenergyprinciples,Impulsesandangularmomentum.
- ✍D'Alemberts principle.
- ✍Motion underconstant torque, Flywheel.

Simpleliftingmachines

- ✍Load,Effort,Mechanicaladvantage,Velocityratio,Efficiencyandrelationbetween them.
- ✍LawofMachine, ReversibilityofLiftingmachine.
- ✍StudyofMachines-Differentialwheel&axel,Westondifferentialpulleyblock,SimpleScrew Jack,Worm&Wheel,Singleand DoublepurchaseWinch,Systemof pulleys.

ReferenceBooks

Sl. No.	Title	Authorand Publisher
1	ATextBookofApplied Mechanics	R.S.Khurmi, S. Chand&CompanyLtd., NewDelhi
2	Applied Mechanics	I. B.Prasad,KhannaPublisher,NewDelhi
3	Applied Mechanics	Ramanathsn,DhanpatRaiandSons,New Delhi
4	EngineeringMechanics	Timoshenko&Young,McGarawhillsPublication
5.	EngineeringMechanics A	S. Rajshekaran & G. Sankarsubramaniam, Vikas PublishingHousePvt.Ltd.NewDelhi
5	StrengthofMaterialandL Mechanicsof Structure C	Punamia,StandardPublisherDistributorNew Delhi

PRACTICAL

- ✍Verificationoflawof triangleof forces.
- ✍Verificationoflawof Parallelogramof forces.
- ✍Verificationoflawof Polygonof forces.
- ✍VerificationofLami‟sTheorembyJibcrane method.
- ✍Demonstration ofNon-concurrent,Non-Parallelforces(Funicular diagram)
- ✍Verificationof LawofMoments.
- ✍DeterminationofC.G.ofagiven lamina.
- ✍Determinationofcoefficientoffrictionforsurfacesofdifferentmaterialson-
    a) HorizontalPlane
    b) InclinedPlane
- ✍Draw–V-Tdiagram‟sfordifferentcombinations of-
    a) Velocities

Uniformaccelerations

Find-outMechanicaladvantage,VelocityRatioandEfficiencyforfollowingmachines-

a) SimpleScrew
b) DifferentialWheel&Axle
c) Simple PurchaseCrab
d) DifferentialPulleyBlock

- ✍Demonstrationofuse ofinclinedplaneasaliftingmachine.

DIMI302

BASICCIVILENGINEERING

DETAILEDCOURSECONTENTS

S. No.	Topics	Content
1	FLUIDPROPERTIES	Propertiesof liquid,definitionof liquid,actionof shearforceson solidsandliquid,typeof fluids,idealfluid,realfluid,definition ofhydrostatics,hydrokinematicsandhydrodynamics.
2	HYDROSTATICS:	Pressureintensity,PASCAL"slaw,variationofhydraulics, absolutepressureand gaugepressure,pressuregauges,types of pressuremeasuringdevices.
3	HYDROKINEMATICS	Principleofconservationofmassanditsapplication,continue, tyequation,typesof flows.Steadyunsteady,laminar,and turbulent, uniform and non-uniform flow. Streamlines and their characteristics.Teynold"snumber.
4	HYDRODYNAMICS	Bernoulli"stheorem,energy"spossessedbyflowingliquid, potential energy, kinetic energy, pressure energy, datum head velocityheadandpressureheadBernoulli"sequation, venturimetr,orificemeterandpitottube.
5	BRICKS	Requirementof goodbricks,typesof bricks,laboratorytestsfor bricks,field-testsforbricksmanufacturingprocessofbricks.
6	STONES AGGREGATES	Requirementofagoodbuildingstone,testsforstones,selection ofstonesfordifferentcivilworks,coarseandfineaggregates, naturaland artificialaggregates.Gradingfaggregates,fineness modules.
7	CEMENT	Compositionof cement,typesofcement,laboratorytestand fieldtestoncement.
8	STEELANDSTEEL PRODUCTS	Compositionfsteel, changeinpropertiesduetoalloying, impuritiesinsteel.Steelallows,defectsinsteel,steelsections, testing of M.S., Bar.
9	TIMBERNDTIMBER PRODUCT	Hardwordandsoftword,characteristicofgoodtimber, defects in timber,preservatives,seasoningoftimber.
10	FOUNDATIONS	Necessityoffoundations,bearingcapacityandsafebearing capacity,typesoffoundation,shallowfoundationanddeep foundation,selectionof type offoundation, procedureto give layout,differentterms.Centrelineplan,foundationplan checkingaccuracyoflayout,utilityofcontrolpoint.
11	MASONRY	BrickMasonry,Necessityofbondsinbrickmasonry,andtheir type,mortarsusedinbrickmasonry,stonemasonry,typesofstone masonry,drystonemasonry,revetment.

PRACTICAL

LISTOFEXPERIMENTS

1. VerificationofBernoulli'sTheorem
2. Calibrationofgivenventurimeter
3. CalibrationofgivenOrficemeter
4. Gradingofcourseaggregates andfineAggregates
5. CompressivestrengthofBricks
6. DeterminationofWaterAbsorption ofBricks
7. Finenesstestoncement
8. Determinationofinitialsettingand finalsettingtimeofcement
9. DeterminationofNormalConsistencyofcement

E) SUGGESTEDINSTRUCTIONALSTRATEGIES: Lecturemethod
Demonstration
Experimentation
sFieldPractice

F) SUGGESTEDLEARNINGRESOURCES:

ReferenceBooks:

1. Buildingconstruction - BySushilKumar
2. BuildingMaterial - ByS.C.Rangwala
3. SoilMechanics - ByS.N.Awasthy
4. SoilMechanics - ByDr.B.C.Punamia
5. FluirMechanics - ByR.S.Khurmi
6. Estimatingandcosting - ByB.N.Dutta

DIMI303

BASICMECHANICALENGINEERING

DETAILEDCOURSECONTENTS:

UNIT-1 MECHANICALPROPERTIES&SIMPLESTRESS&STRAIN:

- ✍Definition of different mechanical properties – elasticity plasticity, ductility,toughness,brittleness,hardness,malleability.
- ✍Tensile,Compressive &ShearStress& Strain.
- ✍DifferentElasticModulii.

DESIGNOFSIMPLECOMPONENT:

- ✍Cotterjoint,knuckle joint,FlangeCoupling&
- ✍Singlerowrivetedjoint.

UNIT–2HYDROSTATICS:

- ✍Physicalpropertiesofafluid,Pascal‟slaw.
- ✍Calculation oftotal force &centerof Pressureforarectangular plate.

HYDRODYNAMICS:

- ✍Continuityequationof flow.
- ✍Bernoulli‟sequation.
- ✍Venturimetres&its uses
- ✍Flowthroughpipes.

UNIT-3BASICSOFTHERMODYNAMICS:

- ✍Properties,Processes,Basiclawsofthermodynamics,
- ✍Thermodynamic cycles.
- ✍I.H.P., B.H.P.,M.M.P.,F. H.P.Simple calculations.

STEAM&GASPOWERPLANTS:-

- ✍Boilers:Basics,ClassificationandConstruction.
- ✍Boiler Mounting& Accessories.
- ✍Ranking cycle.
- ✍Workingprinciplesof Turbine,Compressor,Condenser& Pumps.

UNIT-4I.C.ENGINES:

- ✍Auto, Diesel and Dual cycles.
- ✍Workingprinciples of twostroke&four strokepetrol engine.
- ✍Workingprinciplesof twostroke&four strokediesel engines.

MECHANICALDRIVES:

- ✍Fundamentalsof Rope,Chain &Belt.
- ✍Clutch, gearbox,workingprinciple&relatedsimple problems.

UNIT-5MATERIALHANDLING:

- ✍Types ofhandlingequipment.
- ✍Determinationofhandlingequipmentrequirement
- ✍Factoraffectingthechoiceofhandlingequipment.

MAINTENANCE:

- ✍Maintenancemethod.
- ✍Typesofmaintenance,theirimportanceandfieldofapplications.

ReferenceBooks

Sl. No.	Title	Author,Publisher,Edition & Year
1	Text book of hydraulics	R.S. Khurmi
2	Text book of thermodynamics	R.S. Khurmi
3	Textbookof design&mechanicsof machine	R.S. Khurmi
4.	TextbookofBasicMechanicalEngineering	R.K. Rajput

(a) Others:

- ✍Models, charts,Transparencies, Videofilms etc..
- ✍Desktopmodels ofboilers,engine,mechanicaldevices andsimplemachine components.
- ✍Chartsshowingdetailsofdifferentmechanicalcomponents.
- ✍Designdata book.
- ✍Lab manual
- ✍CD‟s.
- ✍ISI-Codes.

PRACTICAL

LISTOFPRACTICALS/TUTORIALS:

- ✍**Studyofboilermountingsandaccessories.**
- ✍**StudyofSimple&Compoundgeartrainsandcalculationofspeed ratio.**
- ✍**StudyofFlat andV belts.**
- ✍**Studyofdifferenttypeofindustrialchainsand ropes.**
- ✍**StudyofCutterjoint,knucklejointanddifferenttypesof Couplings.**
- ✍**StudyofdifferenttypesofBolted&Rivetedjoints.**

DIMI304

MINEENVIRONMENTALENGG.

DETAILEDCOURSECONTENTS:

UNIT-1MINEATMOSPHERE

Pollutionofmine atmosphere
Minegases.
Originandoccurrenceofminegases.
Effectsanddetectionofminegases.
Methanedrainage
Monitoringsystemofmineenvironment
Analysisofmine air

UNIT–2HEAT ANDHUMIDITY

Heatandhumidityinmineatmosphereandtheireffects
Coolingpowerofmineair
Assessmentofcomfortconditions
Airconditioningofmines,surface,undergroundanddividedinstallations
Spot coolers

UNIT–3MINE VENTILATION SYSTEM

Objectandstandardof ventilation
Degreeofgassinessofmines,compositionofmineair
Measurementofairquantity,pressureand velocity
Lawofairflowinmines,flowofairinductsandmineroadways,resistanceofairways, Chezy's and Atkinson's equations
Equivalentresistanceandequivalentorificeofmine
Regulationsrelatedwithabovetopics,ecologicalandenvironmentallawsrelatedtomines
Dustmonitoring
Mechanical ventilation, different types of fans used in mines, theoretical characteristics ofcentrifugal and axial flow fans, forcing and exhaust fans, relations between pressure quantityandpoweroffan,numericalcalculation,fandrift,theirconstructionalfeature, auxiliary and booster fans, constructional feature, splitting of air current, advantage of splitting, reversal of air current

UNIT– 4NATURAL VENTILATION

Thermodynamicsofnatural ventilation
Distributionandcontrolofaircurrent
Accessoriesofventilationusedinmines–Door,regulator,stoppings,airlock,air crossing,brattice

UNIT–5MINELIGHTING

Lightingsourcesinmines,caplamps,constructionalfeatureof lamps
Undergroundlighting
Flameproofandintrinsicallysafe lighting
Lamproomlayout,lamproomorganization,careandmaintenanceofcaplamps

ReferenceBooks:

Sl.No.	Title	Author,Publication,Edition &Year
1.	Elements of MiningTechnologyVol.2	D.J.Deshmukh
2.	Mineventilation	G.B.Mishra

DIMI305

STRATACONTROLANDROOFSUPPORT

DETAILEDCOURSECONTENTS:

UNIT–1 SUPPORTS

Timber&Steel supports
ExaminationofRoof
RoofBolting
Roofstitching
CableBolting
MethodofsupportingRoadways
SupportingunderdifferentConditionsViz:Pitbottom,crossing,junctions,faultedarea, longwall faces, depillaring areas and stopping areas.
Supportloads,SystematicSupportRules.
Supportplan
Supportwithdrawal

UNIT-2POWEREDSUPPORTS

Poweredsupports
PrincipleofOperationofPower supports
ClassificationofPowersupports

DesignationofPowerSupports
MajorApplicationofPowersupports
Hydraulicfluids

UNIT -3 STOWING

Principalmethodsofstowing
Theirrelativemeritsandapplicability
Hydraulicstowing
PneumaticStowing
MechanicalStowing
Hand Packing
Facearrangements
Pipewear
PipeJams

UNIT -4STRATACONTROL

Basicconceptsofgroundmovement.
RockPressureduetonarrowandwideexcavation
Failureofroofandfloor
MeasurementofStratamovement
DefinitionofRockburst,Bumps,Gasoutbursts,Potholes

UNIT-5 SUBSIDENCE

BasicconceptofSubsidence
DamageandlossduetoSubsidence
Verticalandlateralmovementsandtheirestimation
Angleoffractureandangleofdraw
Factorsaffectingsubsidence
SubsidenceControl
ProtectionofsurfaceStructures
IntroductionofProtectionPillarsincludingshaftpillars..

ReferenceBooks

Sl.No.	Title	Author,Publisher,Edition&year
1.	StrataControlin Mines	Changand Peng
2.	Winningand WorkingofCoal	R.T.DeshmukhandD.J.Deshmukh
3.	ModernCoalMining Practices	R.D. Singh
4.	D.G.M.S.Circulars(Tech.)1995Onwards	
5.	LongwallMining	Syed.S.Changand Peng

SEMESTER-IV

DIMI401

BASICELECTRICALENGINEERING

UnitI

ApplicationandAdvantagesofElectricity:

- DifferencebetweenACandDC
- Variousapplicationsofelectricity
- Advantagesofelectricalenergyoverothertypesofenergy

BasicQuantitiesofElectricity

- Definitionofvoltage,current,powerandenergywiththeirunits
- Nameoftheinstrumentsusedformeasurementofquantitiesgivenin5.1
- Connectionoftheinstrumentsin5.2inelectriccircuit

UnitII

VariousTypesofPowerPlants:

- Elementaryblockdiagramofthermal,hydroandnuclearpower stations
- Briefexplanationoftheprincipleofpowergenerationinabovepowerstations

ElementsofTransmissionLine:

- Pictorialdiagramofathree-phasetransmissionanddistributionsystemshowingtransformers,supports, conductors, insulators and earth wire etc.
- Brieffunctionofaccessoriesoftransmission lines
- Earthingoflines,substationandpowerstation -needandpractices adopted

UNITIII

DistributionSystem:

- Distinctionbetweenhighandlowvoltagedistributionsystem
- Identificationofthreephasewires,neutralwiresandtheearthwireonalowvoltagedistributionsystem
- Identificationofthevoltagebetweenphasesandbetweenonephaseandneutral
- Distinctionbetweenthreephaseandsinglephasesupply

SupplyfromthePolestotheDistributionBoard:

- Arrangementofsupplysystemfrompoletothedistribution board
- Functionofserviceline,energymeter,mainswitch,distributionboard

UNITIV

DomesticInstallation:

- Distinctionbetweenlightandfancircuitsandsinglephasepowercircuit,subcircuits
- Variousaccessoriesandpartsofinstallation,identificationofwiringsystems
- Commonsafetymeasuresand earthing
- IntroductiontoBIScodeofsafetyandwiringinstallation

UnitV

ElectricMotorsandPumps:

- Definitionandvariousapplicationofsinglephaseandthreephase motors
- Connectionandstartingofthreephasemotorsbystardelta starter
- Conversionofhorsepowerinwattsor kilowatts
- Typeofpumpsandtheir applications

PRACTICALS

1. Useof Megger:

Objective:Tomakethestudentsfamiliarwithdifferentusesofmegger

2. Connectionofathreephasemotorandstarterincludingfusesandreversingofdirectionofrotation.

Objective: Students may be made familiar with the equipment needed to control a three-phase motor. The students must experience that by changing any two phases, the direction of rotation is reversed.

3. Connectionofalamp,ceilingfan,socketoutlet,geyser,floorgrinder,voltagestabilizeretc.

Objective:Studentsmaybemadefamiliarwiththedifferenttypesofequipmentandcircuitsusedinthe domestic installations

4. Troubleshootinginathree-phase motor

Note:Theteachermaycreateanyoneofthefollowingfaults

(a) Loose connections
(b) Blownfuse
(c) Trippedoverloadprotection
(d) Incorrectdirectionofrotation
(e) Single phasing
(f) Burntwindingtobesimulatedbyalooseconnectionbehindaterminal box.

Objective: The students must be able to detect the most common faults, which may occur in a t here-phase motor, using meggar wherever necessary

5. Troubleshootinginadomesticwiringsystem.

Note:Theteachermayintroduceafaultintheexistingwiringsystemofaclassroomorworkshoplike

(a) blownfuse
(b) loose connection
(c) faultycomponents/accessoriesetc.

Objective:Studentsmustbeabletodetectcommonfaultswhichmayoccurinadomesticwiringsystem

6. Treatmentofelectricshock

Note:Theteachermaygiveademonstrationhowanelectricshockmustbe treated.

Objective:Studentsmustbetrainedtotreatthepersonssufferingfromanelectricshock

7. StudyofadistributionBoard

Note: Studentsmaybeaskedtostudythedistributionboardintheinstitutionandnotedownallaccessories.

Objective:Studentsmustbemadefamiliarwiththedistributionboard

8. Connectionsandreadingdownanenergy meter

Objective:Studentsmaybeaskedtoconnectanenergymetertoaloadandcalibrate reading

9. Demonstrationinelectricalmachinelaboratory

Objective:Studentsmaybeshowndifferenttypesofelectricalmachinesandtheirstartersandshouldbe told that the three phase induction motors are most commonly used.

10. Studyofsubmersiblemotorpumpset:

Objective:Totelluseofthesetinwatersupplyandirrigation works.

DIMI402

APPLIEDGEOLOGY

DETAILEDCOURSECONTENTS:

UNIT -1PHYSICAL GEOLOGY

Solarsystem,originoftheearth,varioushypothesesrelatedtooriginof earth.
Ageoftheearth,variousmethodsofagedetermination,radioactivemethodsandtheir advantages.
Interioroftheearth–crust,mantleandcore.
Weathering-physicalweatheringandchemicalweathering.Exfoliationandspheroidal weathering.
Workofwind–Erosion,TransportandDepositionventifacts,Pedestalrocks,Sanddunes and Loess.
WorkofRivers:ErosionTransportandDeposition,waterfalls,Menders,oxbowlakes, Alluvial, fans, flood plains, Delta.
Earthquakes:Seismograph,earthquakewaves,classificationofearthquakes,elastic rebound theory, Richter scale of earthquake intensity, Distribution of earthquakes
Volcano:Typesofvolcanoes,Volcanicproducts,Volcaniccones,distributionof volcanoes.

UNIT–2MINERALOGY

Definition,Physicalpropertiesofminerals–Color,Streak,Luster,hardness,Habit, Cleavage, Fracture.
Identificationofcommonminerals-Orthoclase,Plagioclase,Augite,Hornblende,Biotite, Muscovite, Olivine, Quartz, Asbestos, Calcite, Dolomite, Corundum, Gypsum, Talc.

UNIT–3PETROLOGY

ClassificationofRocks-Igneous,SedimentaryandMetamorphic.
Igneous rocks – Acid and basic rocks, Textures of Igneous rocks- Glassy, Vesicular, Prophyritic, Coarse grained, Medium grained, Fine grained and Cryptocrystalline.
Classification – Plutonic, Hypabyssal and volcanic rocks. Tabular Classification Igneous bodies-Batholithic,Laccolith,sillandDyke,Lavaflows,CommonIgneousrocks –Granite, Syenite, Gabbro, Basalt, Trachyte and Rhyolite.
Sedimentaryrocks -definition , Classification, mechanicallyformed, Organicallyformed and chemicallyformedrocks,Sedimentarystructures,Stratification,Lamination,gradedbedding.
Current bedding and ripple marks, common Sedimentary rocks- Conglomerate Sandstone, Shale, Mine stone and Breaccia.
Metamorphic rock – Definition, Agents of metamorphism- Heat, Uniform pressure, Directed Pressure, Chemically active fluids and gases. Structures and textures of Metamorphic rocks – Slaty, Schistose, Gheissose and Granulose. Common Metamorphic rocks – Slate, Schist, Gneiss, Quartzite and Marble.

UNIT–4:STRUCTURALGEOLOGY

DipandStrike,ApparentdipandTruedip.

Folds- Elements of folds, Anticline and Syncline, Limbs, Axial of folds, Types of folds- Symmetrical,Asymmetrical,Overturned,Recumbent,Isoclinal,Plungingfolds,Anticlinorium, Synclinorium , Open fold, Close fold ,Dome and Basin.

Faults–FaultTerminology,Fault-Plan,Hade,Dipandstrike,Throw,Heave,Slip,Hanging wall and foot wall. Classification of faults- Normal and reverse faults, Dip fault, strike fault and Oblique faults, High and low angle faults , Parallel faults, Steps- faults, Graben, Horst, Radial faults, Peripheral faults.

Unconformities-definition,Types–Angularunconformity,Disconformity,Nonconformity.

Joints-Classification-Strikejoints,Dipjoints,Obliquejoints,Beddingjoints,MasterJoints, Sheet Joints and columnar joints.

ReferenceBooks:

Sl.No.	Title	Author,Publisher,Edition&Year
1	A Text book of Geology	K.M. Banger
2	EngineeringandGeneralGeology	Prabin Singh
3	LaboratoryManual of Geology	AjayKumar Sen.
4	Sedimentaryrocks	Pettijohn
5	ElementsofMineralogy	Rutley‟s
6	IntroductiontoPhysical Geology	A.K.Dutta
7	StructuralGeology	P. Billings
8	ThePrincipalofPetrology	Tyrrel
9	A Text book ofGeology	P.K. Mukharjee
10	A Text book ofMineralogy	Dana
11	HkkfrdHkkfoKku	eqdqy?kks"k
12	Hkkjroikd`hHkkoKkfud leh{kk	vfEcdki`lknvxzoky
13	'kfydhdfl}kUr	Vjsy,oif>axju

PRACTICAL

1. IdentificationofMineralsinhandspecimen -Asbestos,Augite,Biotite,Calcite,Corundum, Dolomite,Gypsum,Hornblende,Muscovite,KaoliniteOrthoclase,Plagioclase,Quartz,Talc.
2. IdentificationofRocks–

(i) Granite,Rhyolite,Syenite,Gabbro,Basalt,Trachyte.

(ii) Conglomerate,Sandstone,Shale,Limestone.

(iii) Slate,Schist,Gneiss,Quartzite,Marble.

3. GeologicalmapreadinganddrawingsimpleGeologicalsection-

(i) Geologicalmapsofinclinedbeds.

(ii) GeologicalmapsofUnconformity

(iii) Geologicalmapsof Folds.

DIMI403

MINESAFETYAND LEGISLATION

UNIT-1RELEVANT PROVISIONSOFMINESACT,1952

PreliminaryDefinitions.
MiningBoardsandcommittees.
Provisionsastohealthandsafety.
Hoursandlimitationsof employment.
Provisionsregardingleaves& wages.
Regulations,Rules &by laws

UNIT-2 RELEVANTPROVISIONSOFMINES RULES,1956

PreliminaryDefinitions
Committees.
Provisionsregardinghealthandsanitation,Medicalexaminationofpersonsemployed,workman inspector and committees.
ProvisionsregardingfirstaidandMedicalappliance.
Employmentofpersons.
Provisionsastoleavewithwages.
Welfarecommittees.
Provisionsregardingaccident,classificationasperannexure IandII.
EquipmentsoffirstaidroomandfirstaidstationasperIIandIII schedule.
Abstractoftheminesact&rulefrom(1)to(42)asperVschedule.

UNIT–3 RELEVANTPROVISIONSOFCOALMINESREGULATIONS,1957

Definitions
Dutiesandresponsibilitiesofpersonsemployedinmines.
Provisionsregardingplansandsections.
Provisionsastomines working.
Provisionsregardingprecautionsagainstdangerfromfire,dust,gasandwater.
Ventilation.
Provisionsastoexplosivesandshot firing
Miscellaneousprovisionsastosymbolsformineplanandsection, systematicsupportrulesas per II and III schedule.

UNIT-4 GENERALSAFETYINMINES

Knowledgeofvocationaltrainingof personsemployedinamine.
Refreshercourseformining persons.
Pitsafetycommittee,formation,functionandorganizations

ReferenceBooks–

Sl.No.	Title	Author,Publisher,Editionand Year
1.	MinesAct,1952up-to-date	DGMS
2.	MinesRules,1555up-to-date	DGMS
3.	CoalMinesRegulations,1957up-to-date	DGMS
4.	LegislationinIndianmines-Acritical appraisal	RakeshandPrasad

DIMI404

MINESURVEYING

DETAILEDCOURSECONTENTS:

UNIT -1 MINERS DIAL

Introductionandgeneraldescription.
Takingbearing&observationswitha dial.
MethodofdialTraversing-
i) Looseorfreeneedle methods.
j) Fastorfixedneedle methods
MeasurementofIncludedangles
Fixingof undergroundsurveystation.
Transferofsurveystationfromfloortoroofandfromrooftofloor.
Settingofinstrumentunderroofstation.
Undergroundtraversingwitha dial.
Markingof centrelineofagallery.
Markingofcentrelineinagivendirection.

LEVELLING

Introduction,purposeoflevelling.
Definitionandterminology.
Differenttypesof levels.
Principleandconstructionaldetailsof DumpyandTiltinglevel.
Levellingstaves,typesof staves.
Graduationandleastcounttypesof diaphrams.
Adjustmentoflevellinginstruments –Temporaryandpermanent.
Conceptofdatum,Backsight,Foresight,Station,Changepoint,heightof instrument
Levelbook,Bookingoflevels,Reductionof level.
Heightofinstrumentorcollimation,Riseandfall,Arithmeticalcheck.
Differentiallevellingandchecklevelling.
Problemsonreductionoflevel.
Balancingorequalizingofbacksightandforesight distance.
Typesof levelling.
Errorsinlevellingandprecautiontominimizetheerrors.
Practicalproblemsinlevellingworkas –Levellingacrosssummitsand depression, Across a wall.
Degreeofprecisioninlevelling,closingerroranditsadjustment.
Testingandadjustingof DumpyandTiltinglevels.
Permanentadjustmentoflevels.
MethodsofTraversingandplottingof traverse.

UNIT-2 COUNTERING

Introductionandconcept.
Purposeof countering.
Objectofcountering.
Horizontalequivalent.
Counterinterval.
Factorsaffectingcounterinterval.

Characteristicof counters.
Methodof countering–Directmethod,Indirect method.
Interpolationofcontoursmethods:
i) Estimationmethod,
ii) Arithmeticalmethod.
iii) Graphicalmethod
Plottingofcontourmaps.
Useof contourMaps

SUBSIDENCESURVEY
Definitions.
Fixingofsurveystation.
Transferofcollierybenchmarktothesubsidencearea.
Determinationof positionofasurveystation(longitudinal)displacement.
Determinationofreducedlevelofsurveystation.
calculationofSubsidence–Lateraldisplacement,Verticaldisplacement.
Precautionsduringsubsidencesurvey.
Preparationofsubsidenceplansandsection.

UNIT –3 THEODOLITE
Introduction
Classificationoftheodolite-
a. Transitandnon–transit theodolites
b. Verniertheodolites
c. Micro-optictheodolites
d. Electronictheodolites.

Essentialpartsofthetransitverniertheodolites.
Definitionandthetermsused.
Fundamentalaxisoftheodolitesandtheirrelationship.
Temporaryadjustmentoftheodolites
i) Settingoverthestations
ii) Levellinguptheinstrument
iii) Eliminationofparallaxandfocusingofobject.

Methodoftakingreadings–Vernierreading,calculationofleast count
Measurementofhorizontalandverticalangles –Generalmethod,Repetition method, Reiteration method
Bookingof readings
Methodoftraversing,plottingsurvey work

DIP,STRIKEANDBOREHOLEPROBLEMS:
Definitionofboreholesurveying
Purposeofboreholesurveying
Definitionofdip,strike,trueandapparentdip
Relationbetweentruedip,apparentdipandanglebetweenthem
Numericalproblemsondip,strikeandboreholesurveying

UNIT–4MINEPLANSAND SECTIONS
Generalrequirementofmineplans
Typesofplansandtheir scale
Symbolsusedinmineplans

Preparationofplansandsections
Plottingof traverse
Checkingaccuracyofoldmineplans
Planimeteranditsuses
Enlargementandreductionof plans
Minesregulationsconcerningabovetopics

ReferenceBooks –

Sl.No.	Title	Author,Publisher,Edition&year
1.	Surveyingandleveling,volI&II	T.P. Karnetkar
2.	Surveying,volI&II	B.C. Punamia
3.	AdvanceSurveying, VolI&II	AlamChand
4.	Advancesurveying	D.C. Clark
5.	Surveying,volI&II	Arora

PRACTICAL

LISTOFPRACTICAL/TUTORIALS:

2. Totakethebearingofgivenlinesandmeasuretheincludedanglesbytheverniersof thedial.
3. Totraversetheareabylooseneedlemethodwithminer'sdial.
4. Totraverse agivenareabyfastneedlemethodwith miner'sdial.
5. Tosketchanddescribeadumpylevel.
6. Useandapplicationofamicroopticlevel.
7. Findoutthereducedlevelofdifferentpointswitha givendatum.
8. Tocarryoutdifferentiallevellingandcheckthetheworkby thelevelling.
9. Todrawalongitudinalprofilealongwitha chainline.
10. Todrawacrosssectionacrossgivenchainline.
11. Todrawacontourofgiven areabydirectandindirectmethods.
12. Toconductacompletesubsidencesurveyina givenarea.
13. Tocalculatethecontoursofrequiredreducedlevelandtoplotthesubsidenceworkwith a suitablescale.
14. Tosketchanddescribeatransitverniertheodolite.
15. Tomeasurethehorizontalanglebyrepetitionmethodwithatheodolite.
16. Tomeasurethehorizontalanglebyreiterationmethodwithatheodolite.
17. Studyofmineplans&sections.

DIMI405

WINNINGANDWORKINGCOAL

UNIT-1INTRODUCTIONTOPITTOPANDPITBOTTOMLAY OUT.

Idealpittopandpitbottomlayout.

Tub circuit

Studyof pittopandpitbottomlayoutsof importantU/GminesofIndia.

UNIT-2BOARDSANDPILLARMETHODOFWORKING

BoardandPillarmethodofWorkingunder following.

(a) Workingthin seams.

(b) Workingthick seams.

(c) Workingverythickseamsin Sections.

(d) Workingcontiguousthickseams.

(e) Workingbelowponds,reveres,railways etc.

(f) Workingseamsliabletospontaneousheatingand/orhighlygassy.

Mechanisedboardandpillarworking

(a) WithSDL/tubcombinationLHD/TubCombination.SDL/Chain conveyor combination

(b) Scraper//loader

(c) Continuousminer-roadheaders,dintheaderslayouts.

Advantagesofpanelsystemoverboardandpillar.

UNIT-3LONGWALLMETHODOFWORKING

Suitableworkingconditions

ComparisonbetweenAdvancingandRetreatingmethodoflongwallworking.

Layoutof singleunitanddoubleunitfaces,roof supportinthesystem.

Singleendeddrum.Doubleendeddrum.layouts,sumpingmethod.

Ploughs-applicabilityconstructionlayout.

Mechanisedlongwallmining

A-Layout

B - Conveyors

C-DrumShearer

UNIT-4INTRODUCTIONTOHORIZONMINING

Conditions,suitabilityandlimitation.

Methodsof working.

Studyofsomehorizonminingcasesof India.

UNIT-5THICKSEAMWORKING

Multisectionworkingwithstowing(ascendingorder)

Multisectionworkingindescendingorder.

Multisectionworkingwiththickcoalpartingsandcaving.

Frenchmethodofworkingthickseam.

Problem inmining thick seam, choice of thick seam miningmethods inclined slicing,horizontalslicing,diagonalslicing,transverseslicing,sublevelcaving, Blasting gallery method, cable bolting method of thick seam extraction.

Reference Books–

Sl.No.	Title	Author,Publisher,Editionand Year
1.	Minesplanningfor coal	S.P. Mathur
2.	SurfaceMiningTechnology	SameerKumar
3.	ModernCoalmining Technology	-- --
4.	CoalMineGroundControl Vol-II	Syed.S.Peng
5.	Under groundWinningof coal	T.N.Singh
6.	MineWorkingPartI&II	H.N.Karmkar
7.	ElementsofMiningTechnology,Vol.I	D.J.Deshmukh

SEMESTER-V

DIMI501

ADVANCEMININGGEOLOGY

DETAILEDCOURSECONTENTS:

UNIT–1INDIANSTRATIGRAPHY

GeologicalTimescale,Principlesofstratigraphy,Principleofcorrelation, Stratigraphic classification of Indian rock formations.

PhysiographicdivisionIndia,peninsularIndia,Indo-gangeticplanandextra peninsular India.

Archaeansystem–AbriefaccountoftheDharwarsystem,Sausorgroup,Iron-oregroup,ArchaeanrocksofRajasthan,economicmineralsofArchaeanrocks.

Cuddapahsystem–CuddapahrocksofcuddapahbasinAndhrapradesh, Delhi system, economic minerals of cuddapah rocks.

Vindhyansystem -AbriefaccountofthevindhyanrocksofNorthIndia, economic minerals of vindhyan rocks.

Gondwanasystem-AbriefaccountofthegondwanarocksofIndia,economic minerals of gondwana rocks.

Deccantraps-AbriefaccountofthedeccantrapsofIndia,economic importance of deccan traps.

Fossils–Definition,modeofoccurrence,useoffossils.

ORE DEPOSIT

Conceptofmineral,GangueandTenorofores,abriefoutlineofthe classification of ore deposits.

Magmaticoredeposit–Earlymagmatic,Latemagmatic.

Pegmaticdeposits,Sublimationdeposits,Contactmetasomaticdeposits,

Hydrothermaldeposits–classificationofhydrothermaldeposits,cavityfilling deposits, types of cavity filling deposits, replacement deposits, types of replacement deposits.

Sedimentationdeposits,Evaporationdeposits,Residualdeposits,Mechanical concentration deposits (Placer deposits), types of placer deposits.

Oxidationandsupergeneenrichmentdeposits,metamorphicdeposits.

Controloforedeposition–Structuralcontrols,stratigraphiccontrol,physical and chemical controls.

UNIT-2COALANDPETROLEUM

Rankofcoal,classificationofcoal–Peat,Lignite,Bituminous,Anthraciteand Cannelcoal. 86

Bendedconstituentsofcoal,chemicalpropertiesofcoal,structuralfeaturesof coal seams.

Originofcoal–Insitutheory,Drifttheory,formationofcoalpreservation, Biochemical change, Carbonization and metamorphism.

OccurrenceofcoalinIndia,Abriefoutlineofthelowergondwanafields.

Petroleum,originofpetroleum,migrationofpetroleum,oiltraps,typesofoil traps, petroleum deposits of India.

ORESANDMINERALDEPOSITSOFINDIA

Abriefaccountoftheorigin,occurrence,distributioninIndiaandeconomicuse of the following ores and minerals – Gold, Iron-ore, Manganese ore, Copper ore, Lead and Zinc ore, Aluminum ore, Chromite and Mica.

UNIT3GROUNDWATER

Elementary idea of ground water, occurrence of ground water, zone of aeration,saturation,startable,hydrologicalpropertiesofrocksporosityand permeability, Aquifer.

PROSPECTINGMETHODS

Ground prospecting methods – A brief outline of the various prospecting methods,surfaceprospectingmethods,Geologicalmapping,andTrenching, Pitting, Auguring and wash boring and drilling.

Geophysicalprospectingmethods–Elementarystudyofgravity,magnetic, electrical resistively and seismic methods of geophysical prospecting.

UNIT-4REMOTESENSING

Remotesensinganintroduction,applicationinvariousfields,G.P.S.(Global Positioning System), G.I.S.(Geographic Information System).

ReferenceBooks –

Sl.No.	Title	Author,Publisher,Editionand Year
1.	A text book ofGeology	K.M.Banger
2.	Engineeringand generalGeology	Prabin Singh
3.	OredepositsofIndia	Gokhleand Rao
4.	Geologyof India and Burma	KrishnanM.S.
5.	Groundwaterandtubewell	S.P.Garg
6.	MineralEconomics	SinhaandSharma

7.	Industrialminerals	R.K.Sinha
8.	GeologyofIndia	D.N.Wadia
9.	Groundwaterhydrology	Todd
10.	Economicmineral deposits	A.M Batteman
11.	Ground water	Tolman
12.	GeologyofPetroleum	A.I.Levorsen
13.	Petroleumresourcesanddevelopment	Khan
14.	Hydrology	G.Mahajan
15.	Petroleum Geology	NorthF.K.
16.	A text book ofGeology	P.K.Mukharjee
17.	A text book of Remotesensing	S.S.Agrawal
18.	Dictionaryof Remotesensing	S.M.Rashid
19.	vkfFkZdHkwfoKku	O;kl
20.	vkfFkZdHkw foKku	

PRACTICAL

LISTOFPRACTICALS / TUTORIALS

1. Sketchinganddescribingthevariousgeomorphologicalandstructuralmodels.
2. Constructingthegeologicalcrosssectionfromgeologicalmaps
   i) Maps showingunconformity
   ii) Maps showingFolds
   iii) MapsshowingFaults
   iv) MapsshowingIgneousintrusions
3. Atleastthreeexercisesonmapsofcompletionofoutcrops.
4. Studyofcommonoremineralsinhandspecimen –Al,Fe,Cr,Mg,Mn,Zn,Pb, Sn, Sb, Cu, andArsenic.

DIMI502

MINEFIRES,EXPLOSION,INUNDATION,RESCUEANDRECOVERY

UNIT-1 MINEFIRES–

Factorsresponsible forminefire.
Causesofmine fire.
Accidentalfire,spontaneousheating;factorsresponsiblefor spontaneous heating.
Incubationperiod,crossingpoint, ignitionpoint.
Precautionagainstspontaneousheating.
Preventivemeasuresagainstminefires.
Firestopings-purpose,constructionaldetails.
Openningofasealedofarea.

UNIT-2 GASEXPLOSION

Typesof gas explosion.
Causesoffiredampexplosion.
Upperandlowerlimitoffiredampexplosion;coward'sdiagram.
Precautionagainstfiredampexplosion.
Studyof someimportantgasexplosioninIndiancoalmines.

UNIT-3 DUSTEXPLOSION

Upperandlowerlimitof inflammabilityof dust.
Indexofinflammability.
Causesofformationofdustandcausesofcoaldustexplosion.
Studyofsomeimportantdustexplosioncasesin Indiancoal mines.
Precaution&preventivemeasuresagainstdust explosion.
Stonedustqualityofstonedust;stonedusting;stonedust barriers.
Waterbarriers,handlingofstonedust.
Useofchemicalsandchemicalfoamsagainstcoaldusthazards, health hazards due to coal dust,
Measurementof coaldustconcentrationingeneralbodyof air.

UNIT-4 INNUNDATION

Sourcesofdangerousaccumulationofwaterinmines.
Factorsresponsibleforinnundationinmines.
Precautionsandpreventivemeasuresforinnundation.
Precautionforapproachingwaterloggedareasandworkingbelow water logged area.
Dams–Purpose,siteofdam,typesofdamandtheir constructional details.
Studyof someimportantinnundationcasesinIndianmines.

Additionalprecautioninrainyseasoninthemineslocatednearbythe rivers.

UNIT-5MINERESCUEANDRECOVERYWORK

Rescueapparatus,selfbreathingapparatus,revivingapparatus, Drager BG–4selfcontainedbreathingapparatus,Maxaman-revivingapparatus, selfcontained, self rescuer – Fenzy biocell, Oxybocks, RZ-25, UniversaltesterfortestingofdragerBG-174andBG-4,Quester- II and Quester-III,Computerisedtestingmachines,Dragerpowerpump.

Rescuestations–equipmentsusedinrescuestation,rescue organisation and working, training of officials.

Methodofrescueandrecoverywork

Emergencyorganisationandrescue plan

Recoveryofminesafterexplosion,fireandinnundation

Sealingoffirearea(u/gfire)

Reference Book

Sl.No.	Title	Author,Publisher,Editionand Year
1.	Elements ofminingtechnology–Vol-II	D.J.Deshmukh
2.	MineDisasterandMinerescue	M.A.Ramlu

PRACTICALS:

1. Tostudy,sketchandexplaindifferenttypesoffirestoppings andtheir constructionaldetails.
2. Tostudy,sketchanddescribeaboutstonedustandstone dustbarriers.
3. Tostudy,sketchanddescribedifferenttypesofdams.
4. TovisitRescueStation,studyandexplaindifferenttypesof rescueapparatus.
5. Tostudy,sketchanddescribeFirstAidStationandFresh AirBase.

DIMI503

WININGANDWORKINGMETALS

UNIT-1 IRREGULARDEPOSITS

(Metalliferousores)Natureoforedeposits.ModeoforedepositCode,veinetc

UNIT-2 MODEOFENTRY

shaft-shapeandsize,circular,rectangularorelliptical.InclineInclinedshaft.haft filling

UNIT-3 PREPARATORYWORK

formation ofstations, cross cuts, ore bines, greizzliesetc.Level and raise winz connections, oreblocks.TransportationofBrokenorefromstopetosurface.Primarycrushingunderground

UNIT-4 STOPING

Various methods of stoping, their suitebilities conditions of applicability andmethodsofstoping.Openstopes.Under hand, over hand and breaststoping.Supported stopes–

1. Cut andfillstoping
2. Shrinkagestoping
3. Squaresetstoping
4. Sublevelstoping
5. Gloryholes

Cavingmethodsofstoping.

a. Sublevelcaving.
b. Blockcaving
c. Topslicing
d.

UNIT-5 STUDYOFIMPORTANTMETALLEFEROUS U/GMINES

Kolargoldmines-problemsofdeepmining.
Manganese ore mine- Bherveli(Balaghat).
Mosabanicoppermines.
Khetri coppermines.

ReferenceBooks –

Sl.No.	Title	Author,Publisher,EditionandYear
1.	Minesplanningfor coal	S.P. Mathur
2.	SurfaceMiningTechnology	SameerKumarDGS
3.	MordernCoalminingTechnology	-- --
4.	Coalmine groundcontrolVol-II	Syd.S.Peng
5.	Under groundWinningof coal	T.N.Singh
6.	MineWorkingPartI&II	H.N.Karmkar

DIMI504

MINEMACHINERY&MAINTENANCE

H) DETAILEDCOURSECONTENTS:

UNIT-1 WIREROPES

Typesofwireropes-winding,haulageandguideropes.
constructional details of wire ropes; ropelaying.
Testingofwireropes:calculationof sizeofropes:factorof safety: ropetroubles.
cappingandrecappingofropes.
splicingofhaulageropes:factorofsafety.
Careandmaintenanceofwireropesinuseanditstorage.

WINDING

Differenttypeofwinders.
Headgear:headgearsheave,differenttypeofropecapples, suspension gear, rope capples, safetyhooks.
Breaks-postbrake,cageanditsfittingkepgears,rigid& flexiblerope guides: suspension of ropeguides.
Overwind &over speedprevention.
Factorsgoverningheightofthehead-gear:deadload:live loadand windpressure.

UNIT-2 COALFACEMECHANISATION

Facemechanisation(B&P)classification
Electric coaldrill
Loaders-Powersloaders,operationanduse.
L.H.D.andS.D.L.,operation anduses.
Longwallfacemechanisation
stage loads, AFC,Crush

GATEENDBOX

Purposeofre-motecontrol.
General Principle of working of gate endbox .
Protectionofmachineriesthroughre-motecontrol.
Flame proof and intrinsicsafety.

CHAPTER-5COMPRESSEDAIR MACHINES

Compressedairpower,comparison,andcompressors.
Different kindof compressionandcompressors.
CalculationofworkdoneandH.P.forgivenpressureand quantity of freeair.
Efficiencyof compressors.

Advantageandlimitationofcompressedairpowerover electricalpower.
Compressedairmachinesusedinminesdrills:airleg, pneumatic picksetc.

UNIT-3 INTRODUCTIONTOAERIALROPEWAYS

Differenttypesofaerialropeways.
Monocableandbicableropeways.

Suitabilityanduse.

UNIT-4 CONCEPTOF PREVENTIVEMAINTENANCE

7.1 Conceptofpreventivemaintenanceanditsimportance.

MINE TRANSPORTATIONSYSTEM

Reference Book

Sl.No.	Title	Author,Publisher,Editionand Year
1.	ElementsofMining Technology	D,J.Deshmukh
2.	Scienceand ArtofMiningDigest	C.M.P.D.I. Pub.
3.	MineTransport	Karelin
4.	HeatEngine	Pandya&Shah
5.	Coursein miningGeology	R.N.P.Arogyswamy

PRACTICALS

1. Tostudy,sketchanddescribedifferenttypesofwireropesusedinmines.
2. Tostudy,sketchanddescribedifferenttypesofwindingsystemsusedinmines.
3. Tostudy,sketchanddescribeelectriccoaldrills,powerloaders,longwallface machineries, stage loaders, AFC, crushers,etc.
4. Todescribethelayout,planofoperationandsafetymeasuresof any mechanization observed during training inmines.

DIMI505

DRILLINGANDBLASTINGPRACTICESINMINES

UNIT-1 EXPLOSIVEENERGYAND BREAKAGEMECHANISM

Explosiveenergy,workenergy,wasteenergy.Brakagemechnism,various theoriesofrockbreakage Type of explosive ,- low explosive, high explosive, Permitted explosive.Detonators, types of detonators, detonating fuses, Electric detonator, advantage,precautionsinhandling
Misfires,precautions,statutoryprovisionsrelatedtoshotfiring

UNIT-2 SURFACEBLASTING

Factorsaffectingblastdesign,selectionofvariousblastparameters, Burden, Spacing,Stemmingdistance,Subgradedrilling,depthofhole,benchheight,diameterof hole,Different types of explosives used in o/c mines, LiquidOxygen, ANFO,O.C.G., Slurries,SMS,EmulsionexplosiveDeckchargingandcolumnloading,calculationofchargeper hole andpowderfactor, controlled blasting, special blasting technique.Secondary blasting – Pop shooting and PlastershootingGround vibration measurement – islimitations

UNIT-3UNDERGROUNDBLASTING

Variouscuts,Burden,spacing,depthofhole,stemmingofhole,precautionduring blasting.Solidblastingpractice.

UNIT-4ROCKFRAGMENTATION

Mechanismofrockfragmentation,factorsaffectingrockfragmentation, Techniques to improve rock fragmentation

UNIT-5ENVIRONMENTALIMPACTOFBLASTINGBackbreak,Over break,flyrock,Groundvibration-measurement,Prediction&control measures, air blast,noise

Reference Book

Sl.No.	Title	Author,Publisher,EditionandYear
1.	Elements ofminingtechnology–Vol-I	D.J.Deshmukh
2.	Explosive&BlastingPracticein mines	SameerKumarDas
3.	Open costmining	SameerKumarDas
4.	Explosive&BlastingPracticein mines	Pradhan
5.	Opencostmineworking	B. Ghosh

DIMI506

INDUSTRIALTRAINING

RATIONALE:

Industrial Training is one of the most essential components for a diploma graduate in Mining and Mine Surveying. The sole purpose of industrial training isto expose the students to “real life” situations. Different aspect of mining such as geology, exploration, selection of methodof working, selection of machines for mining, environmental controls and measures, safety in mines and various statutory provisions can only be understood when the students are exposed to different mine workings. Students will cover different coal and metal mines both underground and opencast in such a way that at the end of the completion of diploma programme, they are conversant with different mining conditions. Industrial training also opens avenues of new learning to the students and apply them during their project and industrial training presentations.

SEMESTER-VI

DIMI601

MINEECONOMICSANDBENEFICIATION

UNIT-1GENERAL ECONOMICS

Economicsterms -

a) Wealth
b) Value:
   (i) valuein useand.
   (ii) value inexchange.
c) Goods.
d) Price.
e) Income.
f) Investment.
g) Saving.

Consumptionanditsimportance

a) consumption-satisfaction-needs.
b) Types ofconsumption.
c) importanceofConsumption.

Wants-wantsandeconomicactivities,classification ofwants-

a) Lawofdiminishingutility
b) Law of equi-marginalutility.

Utility-Meaningmeasurment,marginalandtotalutility.

Demand-definition,demandscheduleanddemandcurve.

a) LawofDemand.
b) Extensionandcontractionindemand.
c) Increaseanddecreaseindemand.
d) Elasticityofdemand.

Supply.

a) Supplyofprice.
b) Supplyschedule.
c) Supplycurve
d) Supplyfunction.
e) Lawofsupply.
f) Elasticityofsupply.

Capital-Meaning,definition-

a) Charactersticsofcapital. Wealth
b) andCapital.
c) Capitalandlabour.
d) Capital andlands.
e) ImportanceandfunctionofCapital.

Money:

a) Definitionofmoney.
b) functionofmoney.
c) Classificationofmoney.

UNIT-2 MINEECONOMICS-

Mineralindustry-itsroleinnationaleconomy.

a) Indianmineralresourcesandtheirstatistics.
b) Mineralpolicies.
c) Conservationofmineralsincludingcoalcompany.

Constitution of companies under companiesact.

a) Types ofcompanies.
b) Privateandpublicsector,meritsanddemerits.
   i) Govt.undertakings.
c) NationalisationofcoalindustryformationofCILandits subsidiaries.
d) Elementeryintroductionofthefollowingcompanies.
   i) HCL
   ii) BGML
   iii) BALCO
   iv) MOIL
e) Labour
   i) Efficiencyoflabour.
   ii) Labourwelfare.
   iii) Socialsecurities.
   iv) Tradeunions.

UNIT-3 SAMPLING-

a. Methodsandimportanceofsampling.
b. Sizeofsamples.
c. Classofsamples.
d. Differentmethodsofsampling.
e. Surfacesampling.
f. Under groundsampling.
g. samplingofalluvialdeposits.
h. ErrorsinSampling.

Salting

a. Method ofsalting
b. safegaurdsagainstsalting.
c. Samplingrecords.
d. Computationfortonnage–
   - Averageassayvalue
   - Averageslopingwidth
   - Clearwidth
   - Willingwidth
   - Lengthaverage
   - Averageofblockand totalaverage
   -Prismoidalaveraging

UNIT–4 VALUATION

a) Methodsofvaluation
b) Casesrequiringvaluationriskincalculationofmines

c) Calculationoflifeofamine
d) Valuationreports
e) Mineasa wastingassets
f) Redemptionofcapitaldepriciation

Valuationofmineralpropertyandpreparation ofreport

Reference Book

Sl.No.	Title	Author,Publisher,Editionand Year
1.	Industrialeconomics	V.C.SinhaandPushpaSinha
2.	Mineraleconomics	R.K.Sinhaand N.L.Sharma
3.	Mineralandmineeconomics	R.T.Deshmukh
4.		

DIMI602

OPENCASTMININGANDLANDRECLAMATION

UNIT1-OPENCASTMINING

ClassificationofO.C.mine,manual,semimechanized&mechanized.
ScopeandlimitationofO/Cmines,Advantagesanddisadvantageof O/Cmining. Factors deciding the O/Cmining.
MachineriesusedinO/Cmines.

UNIT2-OPENINGOFO/C MINE

boxcutand accesstrenches.
layoutanddesign–bench,dimensions,heightandwidth,overallpitslope; stability, general layout of O/Cmine.
Drainageinpitandslope.
Suitability&limitationsofO/CMachineries.

UNIT3-REMOVALOFSTRATA

Byscrapers,Dozers,Graders,Draglinesforsoftstrata.shovelsandhaul packs surface miners and bucket wheelexcavators.
By drilling and blasting for hard strata; primary & secondary blasting.
Blastholepattern;burden,spacing,diameteranddepthofblastholes.
Drilling blast holes and drillmachines.
Blast hole geometry , toe formation, sub grade drilling ,creator theory.
DifferenttypesofexplosiveusedinO/Cminesliquidoxygen,ANFO,OCG, slurries, side mixed slurry (SMS) , Emulsion explosive
Deckcharging,&columnloading;calculationofpowder factor/chargefactor.calculationofcharge/hole,controlblastingtechnique-Specialblastingtechnique.detonators- blasting fuses, detonating fuses, Electricdetonators, Nonel & Raydetsdetonators.Secondary blasting – pop shooting and plaster shooting,snake holing,Ground vibration measurement-itslimitations.

UNIT4-LOADINGMACHINARIES

Differentmachinesusedforloading–shovels, dragline,Multibucketexcavators,frontendloader,payloaderand cranes- their application, scope N& capacity.
Timestudyandcalculationofout-putwithshovel,dumper&dragline.

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UNIT5-TRANSPORTATION

Rail transport; trackless transport, Dumpers, conveyors;spreaders,transporthaul road gradient width and slope.Dumps-site, slope and prevention of doublehandling. CHAPTER 6-LANDRECLAIMATION
Physicalrestorationofminedoutareas.Slopestabilization.
Variousmethodsforlandreclamation; afforestation

cultivationetc.

Reference Book

Sl.No.	Title	Author,Publisher,Editionand Year
1.	Elements of miningtechnologyVol-I	D.J.Deshmukh
2.	Surfaceminingtechnology	SameerDas
3.	Explosive&Blastingpracticeinmines	SameerDas

PRACTICALS

1. Tostudyanddiscusstheadvantagesanddisadvantagesofopen castmining.
2. Tostudyanddescribethefactorsdecidingtheopen castmining.
3. Tolistthemachineriesusedinopencastmining.
4. Tostudyanddesigndifferent typesofmineentriesinopencastmines.
5. Tostudyanddesignlayoutofopencast minesfor
   i. manualmines
   ii. mechanizedMinesforthe givenproduction.
6. Tostudyanddescribedifferentcombinationsofloading andtranspiration machines
7. Tostudyandcalculatetheoutputwithgivennumbersofshovel, dumpersand draglines.
8. Tostudyanddescribemethodsoflandreclamation.

DIMI603

MINEMANAGEMENTLEGISLATIONANDGENERALSAFETY

UNIT-1 MANAGEMENT

Generalprinciplesof scientificmanagement.

Managerialfunctionofthefollowinginbrief-

a) Planning.
b) Organising
c) Staffing
d) Direction andcontrol.
e) Motivation

Workstudy inbrief-

a) Motionstudy
b) Timestudy

UNIT-2 SAFETY

Accidents.

a) Classification
b) causes
c) RemedialmeasuresandProvisionsinregulation.
d) Costofaccident
e) Reportwriting.

UNIT-3 LEGISLATION

PreventionandcontrolofpollutionActsandrules(Airandwater)Enviroment(Protection Act 1986 Provisions applicable to mining operationonly.
Provisionsofreclamationminedoutland andaforrestationasperforest conservation Act1980.
AuthorityofpollutioncontrolBoardoverminingIndustryandreturnstobe filed toboard.
Provisionsoflandrequisitionforminingoperations.ThelandrevenueCodeof the state and procedure for thesame.
ElementaryKnowledgeabouttheProvisionsofmineralconecssionrule1960 and mine and mineral (Regulation & Development) Act1957.

MINEMANAGEMENTLEGISLATIONANDGENERAL SAFETY

BOOKRECOMMENDED–

1. MinesAct..
2. CoalminesRegulations.
3. MetalliferousMineRegulations
4. Minerules.
5. IndiandisputeAct.
6. Environment(Protection)Act1986.
7. Environment(Protection)Rules1986.
8. IndianforestAct1927.
9. Thehazardiouswastes Act1988.
10. ForestconservationAct1980.
11. Commentariesonwaterair pollutionandEnvironment(Protection)Laws.
12. Mineralconcessionruless1960.
13. MinesandMineral(Regulationanddevelopment Act1957.
14. Land revenuecode.
15. Contactlabourandabolitionrule.
16. Rescuerules.
17. V.T.Rules.
18. TradeUnionAct.

DIMI604

ADVANCEMINESURVEYING

UNIT-1RECTANGULARCOORDINATE SYSTEM

Definitions; latitudes &departures.
Partiallatitudeandpartialdepartures.
CalculationofPartiallatitudeandpartialdepartures
Total latitude and totaldepartures
CalculationofTotal latitude and totaldepartures
Calculationoflength&bearingfromtotalcoordinates.
CalculationofArea by Partialcoordinate
CalculationofAreabytotalcoordinatesMethods
Nationalgridsystem.
TojoincollierysurveywithN.G.

TACHEOMETRY

General
StadiaDiaphramanditsprinciple. Theory
of anallaticlens.
DeterminationofMultiplyandadditiveconstant.
Tacheometicsurvey.

UNIT- 2CURVE

Definition&propertiesofcircle.
Types ofCurves.
Nomenclatureofasimplecircularcurve.
Elementsofsimplecurve(Circular) Pet
Interval , Degree ofcurve.
Classification of curverangingmethod.
Methodsofsimplecircularcurveranging.

a. Chain andtape
   i. Bysuccessivebisection ofarc.
   ii. bytakingperpendicularoffsets fromtangents.
   iii. bytakingperpendicularoffsets fromlongchord
   iv. Chordandoffsetmethod.
b. Instrumentalmethods.
   i) Chordandanglemethod(tangentialangle method
   ii) bytakinganglesfromsinglestation.(ranking method)
   iii) bytakinganglesfromTwostations.

D.	U/G curve ranging in g met	hods.	
		i)	chordandoff setmethods
		ii)	Chordandanglemethods

SuperElevation.
NumericalProblemsonsimple circularcurve.

CHAPTER-4TRIANGULATIONSURVEY

Definition&principleofTriangulationsurvey.
Classification of Triangulation survey
FixingofStations.
Selectionofsite forBaseline.
Sequenceofoperationbeforebaselinemeasurement.
Equipments required for base linemeasurement.
measurement of baseline
Correctionrequiredinbaselinemeasurement.
Prolongation of a base line.
Adjustmentofhorizontalangles.
Colliery Triangulation
PrecautionsinMeasuringanglesandbaseline.
Triangulation and Precisetraversing.
Truenorthdetermination(App.Method)
Methodsof determining true northastronomicalMethod.
determinationofTruenorthin daytimebyobservingsun. Method ofdetermining latitude and longitudeofasurvey station
Definitionofastronomicalsurveyand Importantterms,of determination
azimuth by astronomicalobservation.

UNIT–3STOPESURVEYING

DefinitionandIntroduction,purposeofstopesurvey.

Methodsofstopesurveyingforflat,moderateindianedofsteeplyindined oredeposits.

OPENCASTMINESURVEYING

fixingofstationsaroundboundary. fixing of stations onbenches.

takingtecheometricobservationtocheckthepositionofstations.

LevellingoperationtodeterminetheR.L.ofStationpoints. to conduct traverse survey to determine the exact position of stations.

Toconductoffsetsurveytodeterminethepositionofbench.

UNIT-4CORRELATIONSURVEY

Purpose ofcorrelationsurvey.

classificationofmethodsoforientation.

Direct methods of traversing.

Assumedbearingmethod(Twoshaftmethod). Exact alignmentmethod.

Approximatealignmentmethod.

Wiessqudrilateral method.

Specialchainoftapemethod. Precise magneticmethod.

Gyrotheodolitemethod.

Correlationwithnationalgridandlocalscalefactor.

DRIFTANDFAULTPROBLEM

Definition,fault,normal,reverseandtranscurrentfault,faultplanehade offault, throw,wantheave, excess.

Numericalproblemsondriftandfault.

INTRODUCTIONTOMODERNSURVEY TECHNIQUES

9.1 Digitaltheodolite,electronicdistancemeasuring equipment, Geodimeter;Tellurometer,Totalstation,Diatomite,software‟s related to minesurveying.

CHAPTER-10INTRODUCTIONTO AERIALPHOTOGRAPHY

GeneralPrinciple;Phototheodolite;Sterophotographicsurveying;aerial surveying-fieldofapplication;Verticalandobliquephotographs;aerial photography;preparationofphotographicalmaps bysimplemethods;

ReferenceBook

Sl.No.	Title	Author,Publisher,Editionand Year
1.	MiningSuveyingVol-I&II	S.Ghatak
2.	SurveyingandlevelingVol-II	KanetkarandKulkarni
3.	SurveyingVol-II	B.C. Punamia
4.	AdvanceSurveying	Alamchand
5.	AdvancemineSurveying	D.C. Clark
6.	SurveyingVol-I&II&III	Arora

PRACTICAL

1. Totraversean areabyincludedanglemethod.
2. Totraversean areabydeflection anglemethod.
3. TotraverseanareabyContinuous azimuthmethod.
4. Todeterminetheheightofanelectricpole/buildingtowerby measuring verticalangle fromasinglestation.
5. Todeterminetheheightofanelectricpole/building towerby measuring verticalangle fromaTwo station.
6. Todeterminetheconstantofgiven ateacheometer.
7. TodeterminethedistancesfromtheInstrumentstationsto the given stations.
8. Totraverseanareabymeasuringhorizontalangles andstaff intercept.
9. Torangeacurvebysuccessivebisection ofarc.
10. Torangeacurvebytakingperpendicularoffsetsfromtangents.
11. Torangeacurvebytakingperpendicularoffsetsfrom longchord.
12. Torange acurvebychordofoff setsmethod.
13. Torange acurvebychordandanglemethod.
14. Torange acurvebymeasuringfromsinglestation.
15. Torangeacurvebymeasuringanglesfromtwostratification.
16. Toprolongagivenbaselineuptoagivenlength.
17. ToMeasureagivenbaselineandapplynecessarycorrectiononit.
18. ToConductatriangulationsurveyinangivenarea.
19. ToConductcorrelationsurveybyexactalignmentmethod.
20. ToConductcorrelationsurveybydirectmethodoftraversing.
21. ToConductcorrelationsurveybyapproximate alignmentmethod.

22. ToConductcorrelationsurveybyquadrilateralmethod.
23. Tocalculatethecoordinateofgivenstationpointsbytaking necessary observationandplotthe samebyrectangularcoordinatesystem.
24. Tocalculatethelengthandbearingofclosinglineofgiven traverseby takingnecessaryobservations.
25. Tocalculatetheareaofagiven closedtraversebytotal coordinatemethod bytakingnecessaryobservations.
26. Demonstrationofmodernsurveyequipments,EDM, Total Tacheomate, stationetc.

DIMI605

ENTREPRENEURSHIPDEVELOPMENT

D) DETAILEDCOURSECONTENTS:

CHAPTER-1 EntrepreneurialDevelopment

- Definitionofentrepreneurship,
- Characteristicsofentrepreneurs,
- Factorsinfluencingentrepreneurship,
- Needforpromotionofentrepreneurshipandsmallbusiness
- EntrepreneurialEnvironment
- Environmentalanalysis.
- Governmentpoliciesforsettingupnewsmallenterprises
- Opportunitiesinserviceindustries.

CHAPTER–2 Forms of BusinessOrganization

- Formsofownership
- SoleProprietorship
- Partnership
- Cooperativesociety
- Joint –stockcompany
- PrivateLimitedCompanies
- Public LimitedCompanies

CHAPTER–3 InstitutionalsupporttoSSI

- Institutionalsetup
- Industriescenters,
- Industrialestates
- InstitutionalsupportatNationallevel
- InstitutionalsupportatStatelevel
- Commercialbanksandfinancialinstitutions

CHAPTER–4 PlanningaSSI

- What isplanning?
- Types ofplanning
- Importanceofplanning
- Steps inplanning
- StepsinplanningaSSI
- Technicaldimensionsforsettingup anenterprise

CHAPTER-5 ManagementofSmallBusinessFirm

- Functionalareasofsmallbusinessfirm

- FundamentalsofManagement
- Managerialeffectiveness
- Essentialdataforeffectivecontrolofsmallbusiness
- Resourcemanagement
- Officemanagement
- EmployeesWelfare&safety
- FactoryrulesandLabourLawsrelatedtoSSIs
- SalesTaxandIncomeTaxlawsrelatedtoSSIs

CHAPTER-6 Projectselection,Formulation&Appraisal

- Projectselection&formulation
- Scopeofprojectreport
- Content&FormatofProjectreport
- NeedofProjectAppraisal
- Stepsof ProjectAppraisal

CHAPTER-7 ProblemsofSmallindustries

- Powershortages
- Projectplanning
- Finance
- Rawmaterial
- Productionconstraints
- Marketing
- Personalconstraints
- Regulations

CHAPTER-8 EntrepreneurialMotivationTraining

- AchievementMotivation
- Creativethinking
- Risktakingabilities

E) SUGGESTEDINSTRUCTIONALSTRATEGIES:

- **LectureMethod.**
- **Industrialvisits.**
- **Simulation**
- **Roleplay**

- **Interactionwithsuccessfulentrepreneurs**
- **Demonstration.**
- **Games**

F) SUGGESTEDLEARNINGRESOURCES:

(a) ReferenceBooks:

Sl. No.	Title	Author,Publisher, Edition & Year
1.	StartingyourownBusiness,Astep-by-step Blue print for the First-time Entrepreneur	StephenC.Harper, Mc Craw-Hill
2.	HarwardBusinessReviewon Entrepreneurship	HarvardBusiness SchoolPress
3.	EntrepreneurshipDevelopmentinsmall scaleproceedingsofNationalSeminar, DCSSI, New Delhi	PatelV.G.
4.	Entrepreneurship:Strategies&Resources	Abrams Grant Pass, Oregon:OasisPress
5.	TheBusinessPlanningGuide	David H. Bangs Upstart Publishing Company,InChicago
6.	EntrepreneurshipdevelopmentinIndia	Dr.C.B.Gupta Dr.N.P.Srinivasan
		SultanChand&Sons