

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Bachelor of Technology

Semester: B.Tech – 4th

Subject: Mine Surveying – I

Total Marks in End Semester Exam: 100

Minimum number of Class Tests: 2

Branch: Mining Engineering

Course Code: B039411(039)

L: 3 T: 1 P: 0 Credits: 4

UNIT- I Basic Concept: Plane and geodetic surveying, spheroid earth shape, effect of curvature, Scope and purpose of mine surveying, duties of mine surveyors.

Plans and sections and their care and precautions in storage and handling, statutory requirements, degree of accuracy, conventional signs used in mine plans, Layout of Mine Survey Office.

UNIT-II Chain Survey:

Linear Measurements; Types of chains; Tapes; Errors in chaining and corrections in linear measurements; Direct and indirect Ranging; Principles of chain surveying offsets; Limiting length of offsets; Booking field notes; Obstacles in chaining; Instruments for setting out right angles.

UNIT- III Compass Survey:

Theory of Magnetism; Dip of Magnetic needle; Prismatic Compass; Surveyor's Compass ;Bearings; Designation of Bearings; Calculation of Included Angles; Local Attraction; Magnetic Declination.

UNIT-IV Plane Table Surveying:

Principles of Plane Tabling; Working operations; Methods of Plane Table Surveying; Two and Three point problems.

Minor Instruments: Study of Planimeter, Eidograph, Pentagraph, Box Sextant, Abney Level, Optical Squares

UNIT-V Levelling: Definitions of important terms used in levelling; Types and Constructional details of different level ; Temporary and Permanent Adjustments; Methods of levelling; Straight edge levelling; Fly levelling; Check levelling; Reciprocal levelling; Longitudinal Sections; Cross- Sectioning; Methods of booking and reduction of levels; Levelling through drifts and shafts (Including steeply inclined shafts) ; Plumbing measurements of depth of shaft. Contouring.

Text Books:

1. Surveying- Vol.I, by B.C. Purmia
2. Surveying & Labelling. Vol-I by T.P.Kanethar & S.V.Kulkarni.

Reference Books:

1. Metalliferous Mine Surveying: Frederick Winniberg
2. Surveying – by Husain & Nagnas

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Bachelor of Technology

Semester: B.Tech – 4th

Subject: Underground Coal Mining

Total Marks in End Semester Exam: 100

Minimum number of Class Tests: 2

Branch: Mining Engineering

Course Code: B039412(039)

L: 3 T: 1 P: 0 Credits: 4

UNIT- I INTRODUCTION:

Origin of Coal, Theories of Coal Formation, Classification of Coal, Coking Coal. Coal Seam and its Classification, Proximate and ultimate analysis of coal .Coal Seam Structures and Abnormalities like Faults, Joints, Cleats, Folds etc., Coal Measuring Rocks and Their Characteristics, Distribution of Coal in India, Indian Coal Mining Industry; Geo mining conditions. Choice of Coal Mining Methods.

UNIT-II BOARD AND PILLAR METHOD:

Important Terminology, Development, Size and Shape of The Pillar and Galleries, Panel System and Without Panel System of development, Size of Panel, Cycle of Operations, Depillaring: Problems in Depillaring, Preparatory Arrangements, Depillaring by Stowing, Depillaring by Caving Methods, Pillar Extraction Techniques, Dangers Associated With Depillaring. Production calculation.

UNIT- III LONGWALL MINING:

Important Terminology, Types of Longwall Faces and Their Choice, Merits and Demerits of Longwall Mining, Development of Longwall Panels and Faces, Longwall Advancing Method, Longwall Retreating Method, Length of Longwall Faces, Rate of Face Advance, Double Unit Longwall Faces, Face Organization and Material Supply. Production calculation.

UNIT-IV MINING UNDER DIFFERENT CONDITIONS: Mining of steep seam, Mining of thick seam,,Sublevel Caving, Blasting Gallery Method. Problem in thick seam mining. Mining of Contiguous Seams and Steeply Inclined Seam, Mining of Seams Prone to Spontaneous Heating & Bumps, Mining of seam below water bodies, extraction of shaft Pillar.

UNIT-V SPECIAL MINING METHODS: Coal Bed Methane, In-situ Gasification, Hydraulic Mining, High wall Mining. Coal Mine regulations connected with the above syllabus.

Text Books:

1. Elements of Mining Technology (Vol. 1 & 3): D. J. Deshmukh
2. Coal Mining: R.D.Singh
3. Modern Coal Mining: Samir Das

Reference Books:

1. Mining Engineer's Handbook (Vol. 1&2), 2nd Edition: Edited by Harold Hartman
2. Introduction to mining: Hartman

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Bachelor of Technology

Semester: B.Tech – 4th

Subject: Mine Machinery – I

Total Marks in End Semester Exam: 100

Minimum number of Class Tests: 2

Branch: Mining Engineering

Course Code: B039413(039)

L: 3 T: 1 P: 0 Credits: 4

UNIT I WIRE ROPES:

Different types of wire ropes, Application of wire ropes in opencast mine & underground Mines, selection, construction & testing of wire ropes, Factor of safety of wire ropes, Mass & Strength of Wire Ropes. Examination of Wire ropes, Care & maintenance of wire ropes. Rope splicing, Rope capel & its type. Process of changing the wire ropes in winding and other haulage system.

UNIT II HAULAGE:

Different systems of rope haulage, safety devices, haulage road and manholes, locomotive haulage and its type, super elevation, track laying and maintenance of haulage , mine cars & tubs. Calculation of productivity & power of different haulage systems.

UNIT III WINDING:

Head gear arrangement, shaft fittings, safety devices, cages & skips, their suspension arrangements.

Location of winding engine. Drum winding and friction winding, their types. Cage winding and skip winding.

UNIT IV WINDERS:

Electric winders, winding drums, types of construction, duty cycle, mechanical & electrical breaking, safety devices on winders, Electrical & Electronic methods of speed control, Multi level winding;

Torque- time & power- time diagram; calculation related with winding. Pit top and pit bottom arrangements.

UNIT V PUMPING:

Sources of mine water, types of pumps, Selection of pump, pump fittings, design calculations, characteristics, operation and maintenance of different types of pump, special types of pumps used in mines.

Text Books

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

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Bachelor of Technology

Semester: B.Tech – 4th

Subject: Surface Mining – I

Total Marks in End Semester Exam: 100

Minimum number of Class Tests: 2

Branch: Mining Engineering

Course Code: B039414(039)

L: 2 T: 1 P: 0 Credits: 3

UNIT I Open Pit Design and Layouts:

Important parameters of Open pit design; Design of Benches, Ultimate pit design, Stripping ratio, Break even stripping ratio, Different methods of opening up the deposits; Box cuts, internal and external box cut, Methods of driving Box cuts; Layout of open pits; Layout of waste dumps, unit operations in opencast mine.

UNIT II Rock Breakage:

Theory of Rock Drilling, Different Types of Drill Machines Used in Open Pits; Rotary, Percussive and Rotary Percussive Drilling, Selection of Drill Machines; Computation of Productivity of Drill Machines;

Inclined Drilling; their advantages and disadvantages. Different Types of Explosives used in Open Cast Mines. Blast hole design

UNIT III Site preparation:

Various steps involved in site preparation, Dozers, Scrapers, Front-End Loaders etc.: Their Construction, Operation, Applicability conditions and Productivity Calculation

UNIT IV Loading and Excavation:

Different Types of Excavators used in Open Pits; Surface continuous miner, Shovel, Dragline, Multi Bucket Excavators: Their Construction, Operation, Applicability conditions and Productivity Calculation

UNIT V Transportation in open pits:

Automobile Transport, Conveyors: Their applicability conditions, limitations & Productivity calculation. Mine closure plan, Land Reclamation and its Methods. Application of Computer in Open Pit Mining.

References:

1. Surface Mining: G.B. Misra
2. Surface mining equipment: Martin
3. Surface Mining: Pfleider
4. Mining: Boki
- 5..SME handbook: Hartman

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Bachelor of Technology

Semester: B.Tech – 4th

Subject: : Basic Electronics& Instrumentation

Total Marks in End Semester Exam: 100

Minimum number of Class Tests: 2

Branch: Mining Engineering

Course Code: B039415(028)

L: 2 T: 1 P: 0 Credits: 3

UNIT- I Transformer: Construction, Phasor diagram, Regulation ,losses and efficiency, open circuit and short circuit tests, Auto transformers and introduction of three phase transformer.

UNIT-II Machine: Construction, principle and operation, Characteristics of AC and DC machine, Types and characteristics of AC and DC machine. Speed control.

UNIT- III Basics of Transducers: Active & Passive Transducers, Analog & Digital Transducers, Classification of transducers according to Applications. Selection of a transducer. Construction, Principles of operation and applications of: Wire wound Potentiometer, Strain gauge, LVDT, Thermistor, Solar cell Transducer, Piezo-electric crystals.

UNIT-IV Signal Conditioning Circuits: Operational Amplifiers: Terminal characteristics, Ideal characteristics, OPAMP as Inverting amplifier, Non-inverting amplifier, Adder, Difference amplifier, differentiator, Integrator, Comparator, Instrumentation amplifier. Passive Filters: High Pass, Low Pass and Band Pass filter using RC- expression for their Gain – BW Product. Wheatstone bridge. Diode Clipper and clamper (only qualitative analysis, no mathematical derivation is required).

UNIT-V Basic Instrumentation System & Components: Block diagram of basic measurement systems: Distortion due to Mechanical loading, Distortion due to Impedance loading, Distortion due to change in signal frequency, Distortion due to electrical noise. Data Acquisition System: Objective of DAS, Single & Multi channel DAS, Computer based DAS. Data Loggers, (Only introductory idea is expected no detail analysis is required).

Text Books:

1. Electronic Instrumentation (2nd Ed.) by H S Kalsi, TMH
2. Elements of Electronic Instrumentation by J. Jha, M.Puri, R. Sukesh Kumar & M. Kowar, Narosa Publishing House.
3. Electronics & Instrumentation by B.R. Gupta, S. Chand & Co.

Reference Books:

1. Electrical & Electronics Measurement & Instrumentation by A.K. Sawheny, Dhanpat Rai Publishing Company.
2. Electronic Instrumentation & Measurement Techniques by Copper & Helfrick, PHI

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Bachelor of Technology

Semester: B.Tech – 4th

Subject: Mine Surveying – I Laboratory

Total Marks in End Semester Exam: 40

Branch: Mining Engineering

Course Code: B039421(039)

L:0 T: 0 P: 2 Credits: 1

List of Experiments: (At least ten experiments are to be performed by each student)

1. Ranging and Chaining of a survey line of nearly 50 meter length.
2. Determination of width of an obstacle which can be seen across but can't be chained.
3. Determination of area of a field by Cross staff survey
4. Determination of included angle with the help of a Prismatic Compass.
5. 5 Plotting and elimination of errors of a closed traverse.
6. Determination of location of instrument station by two point problem.
7. Determination of location of instrument station by three point problem.
8. Determination of elevation by reciprocal leveling.
9. Determination of elevation by Fly leveling.
10. Determination of gradient between two stations using dumpy level.
11. Longitudinal sectioning by Dumpy Level.

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Bachelor of Technology

Semester: B.Tech – 4th

Subject: Underground Coal Mining

Total Marks in End Semester Exam: 40

Branch: Mining Engineering

Course Code: B039422(039)

L:0 T: 0 P: 2 Credits: 1

List of Experiments (Any 10 experiments are to be performed)

1. Study of layouts of Board and Pillar development working by without panel system.
2. Study of layouts of Board and Pillar development working by panel system.
3. Study of layout of Longwall Advancing system.
4. Study of layout of Longwall Retreating system.
5. Study of various line of extraction used for pillar extraction.
6. Study of stook extraction methods under difficult roof conditions.
7. Study of sublevel caving method of thick seam mining.
8. Study of layout of Blasting Gallery method.
9. Study of layout of Hydraulic Mining.
- 10.** Study of Coal Bed Methane extraction.
- 11.** Study of Insitu coal gasification.

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Bachelor of Technology

Semester: B.Tech – 4th

Subject: Mine Machinery – I Laboratory

Total Marks in End Semester Exam: 40

Branch: Mining Engineering

Course Code: B039423(039)

L:0 T: 0 P: 2 Credits: 1

List of experiments to be performed:

1. Study of Different types of Rope Capels.
2. Study of different types of wire ropes.
3. Study of Rope Splicing.
4. Study of Clifton pulley.
5. Study of various safety devices on rope haulages.
6. Study of Exhaust Conditioner on a diesel locomotive.
7. Study of Cage Suspension Gear.
8. Study of detaching safety Hook.
9. Study of Lilly Controller.
10. Study of Turbine Pump.
11. Study of a Balancing Disc.

Chhattisgarh Swami Vivekananda Technical University, Newai

Name of the Program: Bachelor of Technology

Semester: B.Tech – 4th

Subject: Virtual Lab

Total Marks in End Semester Exam: 40

Branch: Mining Engineering

Course Code: B039424(039)

L:0 T: 0 P: 2 Credits: 1

Course objective:

The objective of this course is to inculcate a habit of self learning in our students through virtual lab. Virtual Labs is a project initiated by the Ministry of Human Resource Development, Government of India, under the National Mission on Education through Information and Communication Technology. Virtual lab provides remote experimentation which furnishes basic learning skill, and built advanced concepts as well. It provide complete Learning Management System around the Virtual Labs where the students can avail the various tools for learning, including additional web-resources, video-lectures, animated demonstrations and self evaluation.

List of Experiments

Sl.	Name of Virtual Lab	Website Link	
A	Mine ventilation Lab	http://vlab.iitkgp.ac.in/mv/#	Any 2
	<ol style="list-style-type: none"> 1. Use of Assmann Psychrometer and estimation of Psychrometer properties. 2. Determination of method factor of a duct. 3. Performance Evaluation of Mine Evasee Present in a Ventilation System 		
B	Surveying Lab	http://sl-iitr.vlabs.ac.in	Any 3
	<ol style="list-style-type: none"> 1. Study of various parts of Auto Level 2. Carry out Fly Leveling using Auto Level 3. Profile Leveling using Auto Level 4. Observations of Vertical and Horizontal angles using Total Station 5. Carry out Contouring in the field 6. Study of Global Positioning System (GPS) and its Accessories 7. Observation using GPS 		
C	Mining Geology Lab	https://mg-nitk.vlabs.ac.in/mining-geology	Any 3
	<ol style="list-style-type: none"> 1. <u>Analysis of Contour Maps</u> 2. <u>Analysis of Geological Features like Fault and Fold</u> 3. <u>Identification of Minerals</u> 4. <u>Identification and Study on Physical Properties of Rocks</u> 5. <u>Structural Geology: Analysis of Dip and Strike</u> 6. <u>Borehole Problems</u> 7. <u>Thickness of Strata by Graphical Method</u> 		

D	Strength of material Lab	http://sm-nitk.vlabs.ac.in/	Any 3
	<ol style="list-style-type: none"> 1. Direct Shear Test on Mild Steel Rod 2. Direct Shear Test on Timber Specimen 3. Direct Shear Test on Mild Steel Plate 4. Tensile Test on Cast Iron 5. Compression Test on Mild Steel 		
Equipment/Machines/Instruments/Tools/Software Required:			
1.	Computer system with good connectivity to Internet, any specific software is not required.		
Note:			
1.	Refer Virtual Labs website which is an initiative of ministry of education under the national mission on education through ICT to conduct virtual lab. Link: https://www.vlab.co.in/		
2.	It is advised to visit https://www.vlab.co.in/broad-area-mining-engineering frequently for any update and new experiments on the listed subjects.		

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of program: **Bachelor of Technology**

Branch: **Common to All Branches**

Semester: **IV**

Subject: **Indian Culture and Constitution of India**

Code: **B000406(046)**

Total Theory Periods: **2/Week**

Total Tutorial Periods: **NIL**

Assignments: **Two (Minimum)**

Total Marks in ESE: **NIL** Marks in TA: **10**

Objective: The Constitution is the supreme law and it helps to maintain **integrity** in the society and to promote unity among the citizens to build a great nation. The main objective of the Indian Constitution is to promote harmony throughout the nation.

Course Objectives

Upon completion of this course, the student shall be able

- To understand Meaning and concepts of Traditional and Modern of Culture
- To understand Sources of the Study of Indian Culture
- To Enable the student to understand the history and importance of constitution
- To understand philosophy of fundamental rights and duties
- To understand the powers and functions of executive, legislature and judiciary
- To understand the powers and functions of state government
- To understand the recent trends in Indian constitutional and election commission of India.

UNIT-I

Meaning and concepts of Culture: Traditional and Modern concepts of Culture-Notions of Culture in textual tradition, anthropological, archaeological and sociological understanding of the term culture. Elements of Culture, concept of Indianness and value system. Relation between culture and civilization. Historiography and approaches to the study of Indian Culture– Stereotypes, Objectivity and Bias, Imperialist, Nationalist, Marxist and Subaltern. Heritage of India and world's debt to Indian Culture.

UNIT-II

Sources of the Study of Indian Culture: Archaeological: cultural remains, Monuments, Numismatics, Epigraphy; Literary sources and Oral traditions; Foreign Accounts; Archival sources.

UNIT-III

History of Indian Constitution Constitutional History, Preamble salient features, citizenship, Method of Amendment and Recent Amendments. **Rights and Duties** Fundamental Rights and Directive Principles of State Policy. Fundamental Duties. Difference between Fundamental Rights and Directive Principles of State Policy

Union Government a) President-powers and functions. Vice president powers and functions, Prime Minister and council of ministers powers and functions. b) Parliament- Loksabha, Rajyasabha- composition powers and functions.

c) Judiciary (Supreme Court) composition powers and functions Judicial Activism

UNIT-IV

State Government a) Governor: powers and functions b) Chief minister: powers and functions c) State Legislative Assembly and Legislative Council- composition powers and functions. d) High Court : composition powers and functions

UNIT-V

Recent Trends in Indian Constitutional a) Basic structure of Indian Constitution. b) Electoral Reforms c) Panchayati Raj system in India.

Books of Reference

1. **Dr. P. K. Agrawal** Indian Culture, Art and Heritage,
2. **P. Raghunadha Rao** Indian Heritage and Culture
3. M.V.Pylee, An Introduction to the Constitution of India, New Delhi, Vikas, 2005.
4. Subhash C. Kashyap, Our Constitution: An Introduction to India's Constitution and constitutional Law, New Delhi, National Book Trust, 2000.
5. Durga Das Basu, Introduction to the Constitution of India , New Delhi, Prentice Hall of India, 2001.
6. D.C. Gupta, Indian Government and Politics, VIII Edition, New Delhi, Vikas, 1994.
7. V.D. Mahajan, Constitutional Development and National Movement in India, New Delhi, S. Chand and Co., latest edition.