# Chhattisgarh Swami Vivekanand Technical University, Bhilai

## SCHEME OF TEACHING AND EXAMINATION

### B.E. IV SEMESTER MINING ENGINEERING

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Board of Study</th>
<th>Subject Code</th>
<th>Subject</th>
<th>Periods per week</th>
<th>Scheme of Exam</th>
<th>Total Marks</th>
<th>Credit (L+(T+P)/2)</th>
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<td>Theory/Practical</td>
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<td>1</td>
<td>Mining Engg.</td>
<td>339411 (39)</td>
<td>Mine Environment-I</td>
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<td>339412 (39)</td>
<td>Engineering Materials</td>
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<td>Mining Geology – II</td>
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<td>Underground Coal Mining</td>
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<td>339416 (28)</td>
<td>Basic Electronics and Instrumentation</td>
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<td>339423 (24)</td>
<td>Basic Electrical Engineering Lab</td>
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<td>Humanities etc.</td>
<td>300425 (46)</td>
<td>Health, Hygiene &amp; Yoga</td>
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**L – Lecture, T – Tutorial, P – Practical, ESE- End Semester Exam , CT- Class Test, TA – Teacher's Assessment**

Note (1): Duration of all theory papers will be of **Three Hours**.

Note (2): Industrial Training of six weeks is mandatory for B.E. student. It is to be completed in two equal parts. The first part will be in summer after IV sem. after which students have to submit a training report which will be evaluated by the college teachers during B.E. V sem.
UNIT 1: MINE ATMOSPHERE

UNIT 2: HEAT AND HUMIDITY

UNIT 3: THEORY OF VENTILATION

UNIT 4: NATURAL VENTILATION
Natural Ventilation and Its Measurements, Thermodynamics of Natural Ventilation, Distribution and Control of Air Current, Doors, Regulators, Stoppings and Their Types, Air Crossings, Air Locks.

UNIT 5: MINE ILLUMINATION
Types of Portable Lamps, Their Maintenance and Examination, Lamp Room Design and Organization, Percentage and Accumulation Tests, Lighting from Mains, Photometry And Illumination Surveys, Standards of Illumination for Underground and Open Cast Workings.
UNIT 1: General

UNIT 2: Heat Treatment Of Iron & Steel
Different Types Of Steels, Their Properties and Uses, Different Types Of Heat Treatment Techniques viz. Hardening, Annealing, Normalizing & Tempering and Their Uses in Mining Industry.

UNIT 3: Wire Rope
Types and Construction, Wire Rope Lays, Non-Stranded Ropes, Selection Of Wire Ropes, Ropes Used For Different Purpose, Mass & Strength Of Wire Ropes.

UNIT 4: Construction Materials
Cements – Classification & Properties, Quick Setting Cement, R.C.C., Shotcreting, Brick & Stone Masonries, Application Of Fly Ash In Mining.

UNIT 5: Engineering Behavior of Some Materials
UNIT-1  POLYPHASE CIRCUITS- Power measurement by single and two wattmeter methods, power factor correction by simple methods, star and delta networks, D.C. two wire & three wire system, A.C. three wire & four wire system. Types of cables, Under ground distribution schemes, Electrical Signaling in mines.

UNIT-2  TRANSFORMERS- construction, principle of operation, equivalent circuits, phasor diagram, regulation and losses and efficiency, Open circuit and short circuit tests. Auto transformers and introduction to three phase transformers.

UNIT-3  D.C. MACHINES – construction, principle of operation and characteristics of D.C. Generators, losses and efficiency, Types of D.C. Motors and their characteristics, starters, speed control and industrial applications. Choice of motors for specific and based on characteristics of loads and motors.

UNIT-4  A.C. MACHINES- General principles and construction of alternators, induction motors and synchronous motors, induction motors types, equivalent circuits, torque slip characteristics, starting and speed control, synchronous condenser, use of synchronous and induction motors for rope haulage, locomotive, conveyors, winders, pumps, fan compressors etc, Electric Braking – types, sequence control, various motors enclosures.

UNIT-5  TRANSMISSION AND DISTRIBUTORS OF POWERS IN MINES-D.C. two wire and three wire system, A.C. three wire and four wire system, Types of cable, Underground distribution schemes, Electrical signaling in Mines.

UNIT-6  SWICHGEAR AND PROTECTION – Elementary idea of air break, switches, air break and oil break, circuit breakers, over current, earth fault protection, intrinsically safe apparatus, simplified connection diagram A.C. switch board. Switch gear for coal face machinery.
UNIT 1: Stratigraphy

Introduction, Definitions and Basic Principles Of Stratigraphy; Units of Stratigraphy; Criteria for Stratigraphic Classification and Correlation; Standard Geological Time Scale; Fossils-Elementary Idea about Their Conditions, Modes of Their Preservation and Their Uses; Broad Palaeontological Groups of Animals and Plants; Brief Palaeontological Study of Gondwana Fields.

UNIT 2: Indian Geology

Major Geomorphic Divisions of India; General Review of Indian Stratigraphy; Descriptions of important Indian Geological formations- Archeans, Cuddapahs, Vindhyans, Gondwanas and Tertiaries.

UNIT 3: Economic Geology-I

Introduction and Scope of the subject; Fundamental Terms and Their Definitions; Distribution and Morphology of Minerals Deposits; Brief Review of the Processes of Mineral Formation and the Genetic Classification of Mineral Deposits.

UNIT 4: Economic Geology-II

Mode Of Occurrence, Origin, Distribution, Association and Industrial Uses of Important Metallic (Au, Al, Cu, Fe, Mn, Sn, Pb And Zn) and Non Metallic (Diamond, Mica, Radioactive Minerals, Gypsum, Dolomites, Fire-Clay, Magnesite, Talc, Asbestos, Graphite, Kyanite, Sillimanite, Corundum, Fluorite, Phosphorite, Precious and Semi Precious Stones) Minerals, Petroleum Deposits of India.

UNIT 5: Prospecting and Exploration

Prospecting and Exploration -Their Definitions and Classification Of Methods; Elementary Methods Of Geological, Geophysical, Geochemical Prospecting; Guides To Ores- Ringed Targets, Intersection Loci, Physiographical, Mineralogical, Stratigraphical and Structural Guides To Ores.

References :

1. Fundamentals of Historical Geology and Stratigraphy of India : Ravindra Kumar
2. Geology Of India and Burma : M.S. Krishnan
3. Economic Mineral Deposits : M.L. Jensen & A. Bateman
4. India’s Mineral Resources : S. Krishnaswamy
5. Geophysical Prospecting : M.Dorbin & B. Miller
6. Courses in Mining Geology : Arogyaswamy
7. Applied Geology : S. Banger
UNIT 1: INTRODUCTION
Origin Of Coal, Theories Of Coal Formation, Classification Of Coal, Coaking Coal, Coal Seam and its Classification, 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; Choice Of Coal Mining Methods.

UNIT 2: BOARD AND PILLAR METHOD

UNIT 3: LONGWALL MINING

UNIT 4: THICK SEAM MINING
Problem in Mining Of Thick Seams, Choice Of Thick Seam Mining Methods, Inclined Slicing, Horizontal Slicing, Diagonal Slicing, Transverse Slicing, Sublevel Caving, Blasting Gallery Method, Cable-Bolting Method Of Thick Seam Extraction.

UNIT 5: ROOM AND PILLAR MINING
Vermelles Method, Slant Method, Sublevel Method, Coal Saw Method, Mining Of Contiguous Seams, Mining Of Steeply Inclined Seam, Mining Under Water, Mining of Seams Prone to Spontaneous Heating, Bumps, Air Blast etc.
CHHATTISGARH SWAMI VEVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)

Semester: B.E. IV Sem.
Brach: Mining Engg.
Sub: Basic Electronics & Instrumentation
Code: 339416 (28)

Total Theory Periods: 40
Total Tutorial Periods: 10
Total Marks in End Semester Exam: 80
Minimum number of class test to be conducted: 02

Unit – I: Semiconductor Diodes

Unit – II: Transistors
(8L + 2T)
Junction Transistor: Construction, Various current components inside a transistor, circuit symbol of PNP and NPN transistors, transistor amplifier, input and output characteristics, relation between α and β of a transistor, CB, CE & CC configuration. Field Effect Transistor: construction, principal of operation and characteristics of JFET. Construction, principle of operation and characteristics of MOSFET 0 enhancement and depletion type MOSFET.

Unit – III: Basics of Transducers
(8L + 2T)

Unit – IV: Signal Conditioning Circuits
(8L + 2T)

Unit – V: Basic Instrumentation System & Components
(8L + 2T)
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

Reference Books:
2. Electronic Instrumentation & Measurement Techniques by Copper & Helfrick, PHI.
Semester: **B.E. IV Sem**  
Subject: **Mining Geology-II Lab**  
Total Practical Periods: **36**  
Total Marks in End Semester Examination: **40**

**Practical Exercises of BE- V Semester (Mining Geology)**

Megascopic Description and Distribution of Ore Forming Minerals and Industrial Minerals.  
Study of Plant Fossils.  
List of Practicals to be performed.

1. Detection of presence and accumulation of Firedamp in mine atmosphere.
2. Detection of presence and accumulation of CO in mine atmosphere.
3. Study of various techniques of methane drainage.
4. Study of surface airconditioning plant.
5. Study of underground airconditioning plant.
6. Study of different types of ventilation devices.
7. Study of cap lamps used in underground mine.
8. Study of Flame safety lamps used in underground mine.
9. Design of a cap lamp room for a large underground coal mine.
List of Experiments

1. Magnetisation Characteristics of a separately excited DC Machine
2. Speed Control of a DC Shunt Motor.
3. Load Test on a DC Shunt/Compound Motor.
4. Load test on a DC Shunt / Compound Generator.
5. Connection, Starting Reversing and load Test on a 3 phase Induction motor.
7. Study of Star-Delta Starter.
10. Load Test on single phase Transformer and calculation of performance.
List of Practicals 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 Logwall Advancing system.
4. Study of layout of Logwall Retreating system.
5. Study of various line of extraction used for pillar extraction.
6. Study of stook extraction method under difficult roof conditions.
7. Study of surface arrangement required for stowing.
10. Study of layout of Double Unit Longwall Faces.
CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Semester: B.E. IV Sem. Branch: Common for all branches
Subject: HEALTH, HYGIENE & YOGA Code: 300425 (46)
No. of Periods: 2 pds/week Tutorial Periods: NIL
Total Marks in End Semester Exam.: NIL Teacher's Assessment: 40 Marks
Minimum number of class tests to be conducted: Two

UNIT- I
HEALTH & HYGIENE: Concept of health, Physical health and mental health and wellbeing and how to achieve these, longevity and how to achieve it, concept and common rules of hygiene, cleanliness and its relation with hygiene; Overeating and undereating, amount of food intake required, intermittent fasting; adequate physical labour, sleep; consumption of junk fast food vs nutritious food; fruits, vegetables cereals and qualities of each of these.

UNIT- II
INTRODUCTORY KNOWLEDGE OF COMMON STREAMS OF MEDICINAL CURE: History, development, basic concepts, modes of operation of Alopeathy, Ayurved, Homoeopathy, Biochemic, Unani, Siddha, Accurpressure, Accupuncture, Naturopathy, Yogic and Herbal system of medicines, Introduction of Anatomy and Physiology concerned.

UNIT- III
YOGASANS: Meaning and concept of Yoga, Yogasans and its mode of operation, How to perform Yogasans, Common Yogasans with their benefits, such as, Padahastasan, Sarvangasan, Dhanurasan, Chakrasan, Bhujangasan, Paschimottasan, Gomukhasan, Mayurasan, Matsuysan, Matsuysendraesan, Pawannuktasan, Vajrasan, Shalabhasan, Sinhasan, Shashankasan, Surya Namaskar, Halasan, Janushirasnas, Utshap Mudra.

UNIT- IV
YOGASANS FOR COMMON DISEASES: From Yogic Materia Medica with symptoms, causes, asans and herbal treatment.
- Modern silent killers: High blood pressure, diabetes and cancer, causes and cure; Common health problems due to stomach disorders, such as, indigestion, acidity, dycentry, piles and fissures, artheritis, its causes, prevention and cure.
- Asans for relaxation: Shavasan, Makarasen, Matsuysakridasan, Shashankasan.
- Asans to increase memory and blood supply to brain: Shirsh padasan, Shashankasan.
- Asans for eye sight: Tratak, Neti Kriya.
- Pranayam: Definition and types: Nadi Shodhan, Bhastrik, Shitakari, Bhamari useful for students.

UNIT V
CONCENTRATION: Concentration of mind and how to achieve it. Tratak (आटक), Concentration on breath, Japa (ज्ञप), Ajapajap (अज्ञपाज्ञप), internal silence (अन्तर्मून), visualization in mental sky (विकादकझ धारणा), Concentration on point of light (ज्योति ध्यान), Concentration on feeling (भाव ध्यान), Concentration on figure (पूर्ण ध्यान).

REFERENCES
1. Yogic Materia Medica
2. Asan, Pranayam and Bandh

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