

Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING AND EXAMINATION

B.E. III SEMESTER MINING ENGINEERING

S. No.	Board of Study	Subject Code	Subject	Periods per week			Scheme of Exam			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory/Practical				
							ESE	CT	TA		
1	Civil Egg.	339311 (20)	Mechanics of Solids & Fluid Mechanics	3	1	-	80	20	20	120	4
2	Electronics & Telecom.	328316 (28)	Programming with C	3	1	-	80	20	20	120	4
3	Mining Egg.	339313 (39)	Mining Geology - I	4	-	-	80	20	20	120	4
4	Mining Engg.	339314 (39)	Mine Surveying-I	4	1	-	80	20	20	120	5
5	Appl. Mathematics	300311(14)	Mathematics-III	3	1	-	80	20	20	120	4
6	Mining Engg.	339316 (39)	Introduction to Mining	3	1	-	80	20	20	120	4
7	Mining Engg.	339321 (39)	Introduction to Mining Lab	-	-	2	40	-	20	60	1
8	Mining Engg.	339322 (39)	Mining Geology – I Lab	-	-	2	40	-	20	60	1
9	Mining Engg.	339323 (39)	Mine Surveying-I Lab	-	-	4	40	-	20	60	2
10	Elect. & Telecom.	339324 (39)	Programming with C Lab	-	-	4	40	-	20	60	2
11	Humanities etc.	300325 (46)	Value Education	-	-	2	-	-	40	40	1
12			Library	-	-	1	-	-	-	-	-
				20	5	15	640	120	240	1000	32

L – Lecture, T – Tutorial, P – Practical, ESE- End Semester Exam , CT- Class Test , TA – Teacher’s Assessment

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

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester: **B.E. III Sem.**

Branch: **Mining Engineering**

Subject: **Mechanics of Solids and Fluids Mechanics**

Code: 339311 (20)

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-1

Concept of Stress and Strain

Stress and strain at a point; Axial and shear stresses' Ultimate an working stresses; Relation between stress and strain' Poisson's Ratio; Two dimensional state of strain' Principle stresses and Principle planes' Mohr's Circle' Two state of strain' Principle strains and principle axis of strain; Determination of Principle strain from strain measurements; Calculation of Principle stresses from; Principle strains; Composite bars in tension and compression; Thermal stresses in composite bars.

UNIT-2

Bending Stresses in Beams and plates

Pure bending' Bending Stresses' Section Modulus of rolled and built up sections Composite beams' Distribution of normal and shear stresses across the section of a simple beam with vertical section of symmetry; Theory of plates.

UNIT-3

Deflection of beams

Slope and deflection of beams by deflection methods; Area moment and conjugate beam methods' propped cantilever and fixed beams.

UNIT-4

Introduction to Fluid Mechanics

Physical properties of fluids; Compressible and Incompressible fluids; Newtonian and Non- Newtonian fluids.

UNIT-5

Fluid Statics

Pressure, density and height relationships; manometer pressure on curved and plane surfaces; Centre of Pressure; Buoyancy; Stability of Immersed and Floating bodies; Fluids in relative equilibrium.

UNIT-6

Fluid Kinematics

Classification of flow: Uniform and Non-Uniform; Steady and Non- Steady; Laminar and Turbulent; One, Two, Three dimensional flows; Stream lines; Streak lines; Path lines; Stream Tubes; Elementary Explanation of stream function and velocity potential; Basic idea of flow nets.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **B.E. III Sem.**
Subject: **Programming with C**

Branch: **Mining Engineering**
Code: **328316 (28)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Total Marks in End Semester Examination: **80**

Minimum number of Class tests to be conducted: **Two**

Unit – I

Introduction to C Language : history and development .C compilers. Data types, types of instructions, input/output functions. Operators , precedence and associativity of operators. Type casting, Developing simple programs , compilation , debugging and testing of programs. Relevance of C language.

Unit – II

Conditional constructs : if statement , if-else statements , nested if-else ,forms of if. Conditional operator, Switch case construct .Loop control structures ,nested loops,break and continue statements. goto statement. Arrays : Syntax and definition, one and multidimensional arrays, reading and writing an array. Pointers and arrays.

Unit – III

Functions : Declaring and defining functions ,storage classes ,call by value, introduction to pointer data type ,call by reference, using library functions in programs, macro definitions. Preprocessor directives - #if, #elif, #define etc. Passing arrays into functions. Recursion.

Unit – IV

Strings: reading and writing strings, passing a string into a function, using library functions to manipulate strings. Array of strings.
Structures: Declaring and using structures. Array of structures, passing structures into function. Unions and enums, Pointers to structures Bit fields.

Unit – V

File Handling : reading and writing text files through C programs . File manipulating functions : fputc, fgetc, fgets, fputs, fseek, ftell etc. Working with Binary files , fread and fwrite. Command line arguments. Bitwise operators in C.

Name of Text Books:

1. Let us C – Yashwant KanetkarBPB Publication
2. Programming in ANSI C – E. Balaguruswamy Tata Mc-Graw Hill

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

BHILAI (C.G.)

Semester : **B.E. III Sem.**

Subject: **Mining Geology-I**

Total Theory Periods: **40**

Total Marks in End Semester Examination: **80**

Minimum number of Class tests to be conducted: **Two**

Branch: **Mining Engineering**

Code: **339313 (39)**

Total Tutorial Periods:

UNIT 1: The Earth in Space and Time

Solar System; Size, Shape, Mass and Density of Earth; A Brief idea of the origin and the age of the Earth; Interior of the Earth- seismic data, Density and Pressure within the Earth; The internal structure and composition of Earth;; Elementary knowledge of Diastrophism, earthquakes and volcanism, Volcanic and earthquake belts, and their relationship with plate tectonics.

UNIT 2: Mineralogy

Physical Properties of Minerals; Classification of various Rock forming Minerals; Introduction and preliminary study of principle Rock forming Mineral groups - Garnet, Pyroxene, Amphibole, Mica, Feldspar and Felspethoid, Megascopic properties of Economically important non Silicate Minerals.

UNIT 3: Igneous and Metamorphic Petrology

Elementary knowledge of Magma and its Crystallization; Classification of Igneous Rocks; Textures and Structures of Igneous Rocks; Petrographic Description of Common Igneous Rocks; Agents and Types of Metamorphism; Depth zones, Facies and Grades of Metamorphism and Petrographic Description of Common Metamorphic Rocks.

UNIT 4: Sedimentary Petrology

Textures and Structures of Sedimentary Rocks; Sedimentary Processes- Weathering, Transportation and Deposition; Classification and Petrographic Description of Common Sedimentary Rocks.

UNIT 5: Structural Geology

Concept of Deformation; Primary and Secondary Planer and Linear structure of Rocks; Topography and its representations; Altitude of strata- Dip and strike; Outcrop patterns; Width of Outcrop and thickness of beds; Structural Contours; Geological Maps; Study of Unconformity; Folds, Joints, Faults and their influence in Mining Operations.

References:

1. Engineering And General Geology : Parbin Singh
2. Physical And Engineering Geology : S.K. Garg
3. Rutley's Elements of Mineralogy : H.H.Read
4. Principles Of Petrology : G.W.Tyrell
5. Structural Geology : M.P.Billings
6. Geological Maps : G.W.Chiplonkar
7. A Text Book of Geology : P.K. Mukherjee
8. Applied Geology : S. Banger

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **B.E. III Sem.**

Subject: **Mine Surveying-I**

Total Theory Periods: **40**

Total Marks in End Semester Examination: **80**

Minimum number of Class tests to be conducted: **Two**

Branch: **Mining Engineering**

Code: **339314 (39)**

Total Tutorial Periods:

UNIT 1: 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 2: 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 3: Plane Table Surveying

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

UNIT 4: Miner's Dial

Construction; Use; Tests and Adjustments; Loose and fast Needle surveying; Common sources of errors in Dial surveying; Methods of elimination and compensation.

UNIT 5: Levelling

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

References:

1. Metalliferous Mine Surveying : Frederick Winniberg
2. Surveying and levelling : Kanetkar and Deshpande

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester : **B.E. III Sem.**

Branch: **Mining, Civil, Mech,
& Chem. Engg.**

Subject : **MATHEMATICS-III**

Code : 300311 (14)

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 - 1 FOURIER SERIES

(No. of periods 8+2)

Euler's Formula, Functions having points of discontinuity, Change of interval, Even & Odd functions, Half range series, Harmonic analysis.

UNIT - 2 LAPLACE TRANSFORM

(No. of periods 8+2)

Definition, Transform of elementary functions, Properties of Laplace transform, Transform of derivatives & integrals, Multiplication by t^n , Division by t , Evaluation of integrals, Inverse Laplace Transform, Convolution theorem, Unit step function, Unit impulse function, Periodic function, Application to solution of ordinary differential equations.

UNIT - 3 PARTIAL DIFFERENTIAL EQUATION

(No. of periods 8+2)

Formation, Solution by direct integration method, Linear equation of first order, Homogeneous linear equation with constant coefficients, Non-homogeneous linear equations, Method of separation of variables.

UNIT - 4 COMPLEX VARIABLE

(No. of periods 8+2)

Derivative, Cauchy-Riemann equations, Analytic functions, Harmonic functions, Flow problems, Complex integration, Cauchy theorem, Cauchy integral formula, Taylor & Laurent series, Singularity, Residue, Evaluation of real definite integrals.

UNIT - 5 STATISTICS

(No. of periods 8+2)

Random variables, Discrete & continuous probability distributions, Expectation, Mean & Standard Deviation, Moments & moment generating function, Distributions- Binomial, Poisson and Normal distributions.

TEXT BOOKS: -

1. Higher Engg. Mathematics by Dr. B.S. Grewal– Khanna Publishers.
2. Advanced Engg. Mathematics by Erwin Kreyszig – John Wiley & Sons.

REFERENCE BOOKS: -

1. Advanced Engg. Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.
2. Applied Mathematics by P.N. Wartikar & J.N. Wartikar. Vol- II– Pune Vidyarthi Griha Prakashan, Pune.
3. Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **B.E. III Sem.**

Branch: **Mining Engineering**

Subject: **Introduction to Mining**

Code: **339316 (39)**

Total Theory Periods: **40**

Total Tutorial Periods:

Total Marks in End Semester Examination: **80**

Minimum number of Class tests to be conducted: **Two**

UNIT 1: Exploratory Drilling

Drilling machines used for exploratory drilling viz. Rotary & Percussive, their attachments; Core Barrels; Conditions of applicability of drilling methods; Borehole Survey, Directional drilling, Underground methods of exploratory drilling.

UNIT 2: Drivage of Inclines/Drifts/Adits

Types of Openings; Choice of Openings; Location of Openings; Drilling, blasting, loading and transportation of muck during drivage of inclines/adits/drifts, Ventilation, lighting and drainage, Extension of center line; Organization and cycle of operations; Mechanized methods of drivages of inclines/adits/drifts.

UNIT 3: Shaft Sinking

Drilling, blasting, loading and transportation of muck, Ventilation, lighting and drainage, Extension of center line; Shaft lining and its design; Special methods of shaft sinking; Shaft boring; Deepening and widening of shafts. Upward drivage; Organization and cycle of operations.

UNIT 4: Introduction to Underground Mining

Definition of important terms, Mine development, Activities involved in development of a mine, Stages in the life of a mine, Introduction to unit operations in underground mining. Choice of method of mining, Introduction to various Underground Mining methods. Introduction to various types of machineries used in Underground mining.

UNIT 5: Introduction to surface Mining

Definition of important terms, Advantages and disadvantages of surface mining, mineral deposits amenable to surface mining, Various surface mining methods, Introduction to unit operations in surface mining. Introduction to various types of machineries used in surface mining.

References:

- | | |
|--|----------------------------|
| 1. Surface Mining | : G.B. Misra |
| 2. Mining Engineer's Handbook
Vol. 1&2, 2 nd Edition | : Edited by Harold Hartman |
| 3. U.M.S. Notes | : |
| 4. Elements of Mining Technology
Vol. 1&3 | : D.J.Deshmukh |
| 4. Mining of Mineral Deposits | : Shevyakov |
| 5. Modern Coal Mining | : Samir Das |
| 6. Coal Mining | : R.D.Singh |
| 7. Mining | : Boki |
| 8. Introduction to mining | : Hartman |

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **B.E. III Sem.**
Subject: **Introduction to Mining Lab**
Total Practical Periods: **24**
Total Marks in End Semester Examination: **40**

Branch: **Mining Engineering**
Code: **339321 (39)**

List of Practicals to be performed (Minimum 10)

1. Study of exploratory drilling by manual and power operated percussive drilling machine.
2. Study of working of diamond drilling machine.
3. Study of different types of drilling tools and bits required for exploratory drilling.
4. Study of Single tube and double tube Core barrel.
5. Study of surface arrangements required during shaft sinking and its cycle of operation.
6. Study of various special methods of Shaft sinking.
7. Study of drivage of Incline/Adit by conventional method using drilling and blasting, cycle of operation and calculation of manpower.
8. Study of drivage of Incline using tunnel boring machine.
9. Study of erection of temporary lining during shaft sinking operation.
10. Study of erection of permanent brick/concrete lining during shaft sinking.
11. Study of development of a coal mine by Board & Pillar method.
12. Study of development of a coal mine by Longwall advancing & retreating method.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **B.E. III Sem.**
Subject: **Mining Geology-I Lab**
Total Practical Periods: **36**
Total Marks in End Semester Examination: **40**

Branch: **Mining Engineering**
Code: **339322 (39)**

Practical Exercises of BE- 3rd Semester (Mining Geology)

Maximum Marks 50

Megascope Description of Rock Forming Minerals.

Megascope Description of important Igneous, Sedimentary, Metamorphic Rocks.

Basic Concept of Contours, Attitude of Beds, Width of Outcrop, True and Apparent Dips, Rules of V's.

Study of Geological Maps and Preparation of Cross Sections.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **B.E. III Sem.**
Subject: **Mine Surveying –I Lab**
Total Practical Periods: **48**
Total Marks in End Semester Examination: **40**

Branch: **Mining Engineering**
Code: **339323 (39)**

List of Practicals to be performed (minimum 10)

- 1 Ranging and Chaining of line of 50 Meter.
- 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 Study of various types of chained.
- 5 Determination of included angle with the help of a Prismatic Compass.
- 6 Plotting a closed traverse and elimination of errors.
- 7 Determination of width of an inaccessible obstacle by intersection.
- 8 Determination of location of instrument station by two point problem.
- 9 Determination of location of instrument station by two point problem.
- 10 Determination of location of instrument station by three point problem.
- 11 Study of Miner's dial.
- 12 Study of Dumpy level.
- 13 Determination of difference in elevation and gradient between two stations using dumpy level.
- 14 Fly leveling by Tilting level.
- 15 Longitudinal sectioning by Level.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **B.E. III Sem.**
Subject: **Programming with C Lab**
Total Practical Periods: **48**
Total Marks in End Semester Examination: **40**

Branch: **Mining Engineering**
Code: **339324 (39)**

List of programmes to be executed (but should not be less than 10):

1. Write a program to take the radius of a sphere as input and print the volume and surface and surface area of that sphere.
2. Write a program to take a 5-digit number as input and calculate the sum of its digits.
3. Write a program to take three sides of a triangle as input and verify whether the triangle is an isosceles, scalene or an equilateral triangle.
4. Write a program that will take 3 positive integers as input and verify whether or not they form a Pythagorean triplet or not.
5. Write a program to print all the Prime numbers between a given range.
6. Write a program to define a function that will take an integer as argument and return the sum of digits of that integer
7. Write a program to define a macro that can calculate the greater of two of its arguments. Use this macro to calculate the greatest of 4 integers.
8. Write a program to define a recursive function that will print the reverse of its integer argument.
9. Write a program to print the sum of first N even numbers using recursive function.
10. Write a program to sort an array using Bubble sort technique.
11. Write a program that will take the elements of two integer arrays of 5 element each, and insert the common elements of both the array into a third array (Set intersection)
12. Write a program to take 5 names as input and print the longest name.
13. Write a program to define a structure Student that will contain the roll number, name and total marks of a student. The program will ask the user to input the details of 5 students and print the details of all the students whose total marks is greater than a given value.
14. Write a program to define a union Contact that will contain the members Mobile no and E-mail id. Now define a structure Employee that will contain name, roll number, mode of contact (mob/e-mail) and a variable of type Contact as members. The program will ask the user to give the details of two Employees including mode of contact and the contact num/ E-mail. Print the details of both the Employees.
15. Write a program that will ask the user to input a file name and copy the contents of that file into another file.
16. Write a program that will take any number of integers from the command line as argument and print the sum of all those integers.

List of Equipments/Machine Required:

PCs, C-Compiler

Recommended Books:

Programming in ANSI C – E. Balaguruswamy

Tata Mc-Graw Hill

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester : **B.E. III Sem.**

Branch : Common to all Branches

Subject : **Value Education**

Code : 300325(46)

No. of Periods : 2 pds/week

Tutorial Periods : NIL

Total Marks in End Semester Exam. : NIL

Teacher's Assessment : 40 Mks

Minimum number of class test to be conducted : Two

Unit – I

- **STUDY OF BASIC HUMAN OBJECTIVES** : Everlasting solution (समाधान), prosperity (समृद्धि), trust in self and others (अभय), and coexistence (सहअस्तित्व) for balance in nature. Need and importance of aforesaid basic human objectives and how to achieve these.

Unit – II

- **CONCEPT AND UNDERSTANDING OF HUMAN HAPPINESS**
Meaning and concept of "happiness", incessant happiness, its relationship with guarantee of physical needs, comforts, physical and sensory pleasures with its transient nature, misery; The only method to minimize incessant happiness gaining right understanding about oneself, one's body, one's relationship with other human beings, Nature and total existence.

Unit – III

- **PROPER UNDERSTANDING** about the order in Nature (व्यवस्था) and co-existence (सहअस्तित्व) at various levels, such as, I and my body, family, society, Nature and existence.
- **UNDERSTANDING THE SELF**: Understanding human reality – I and my body, present understanding of the self, physical needs, relation with others and with Nature, gaining proper understanding of the self, discrimination between 'I' and my 'body', characteristics and the needs of 'I', of my 'body' and 'body' & 'I'.

Unit – IV

- **SYNERGATIC ORDER (व्यवस्था) and COEXISTENCE (सहअस्तित्व) among HUMANS, IN NATURE & IN EXISTENCE** :
 - Conceptual understanding of natural relations and consequent values, of family and relation therein, of society and role of engineers therein, overall excellence' : concept, its universal parameters and total human behaviour
 - Inanimate (जड़) and consciousness (चैतन्य) aspects of Nature, Four distinct synergetic orders in Nature - Padaarth Awastha (पदार्थ अवस्था), Pran Awastha (प्राण अवस्था), Jiv Awastha (जीव अवस्था), and Gyan Awastha (ज्ञान अवस्था), complementary supplementary evolutionary connection amongst above orders, identifying and implementing "Appropriate Technology".
 - Synergetic order among interacting entities of Nature operating in all pervading changeless Shunya or Satta, Indivisible interconnectedness of Satta and Prakriti and its implications.

Unit – V

- **IMPLICATIONS OF PROPER UNDERSTANDING**
 - Awakening (जागृति), the common goal of all human beings,
 - promotion and perseverance of synergetic order and co-existence at all levels leading to incessant happiness.
 - Natural manifestation of universal human values and thereby incessant happiness
 - Undivided Society (अविभाज्य समाज) and Universal Organised System (सार्वभौम व्यवस्था)
 - Transition from synergetic disorder (अव्यवस्था) to synergetic order (व्यवस्था)
 - Evaluation of Understanding, work and behaviour.

REFERENCES

1. Jeevan Vidya Camp (शिविर) notes
2. An Introduction to Jeevan Vidya by Shri A. Nagaraj