

MATS School of Engineering & I.T

MATS University

Raipur



Syllabus Scheme

(3rd Semester)

For

DIPLOMA PROGRAMME

IN

CIVIL ENGINEERING

Subject Code For DIPLOMA PROGRAMME IN CIVIL ENGINEERING

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3rd Semester (Civil)

S.No.	Subject Code	Subject Name
THEORY		
1	DP-320	Surveying-I
2	DP-321	Civil Engineering Materials
3	DP-322	Engineering Geology
4	DP-323	Mechanics of Structures
5	DP-324	Building Construction & Civil Engineering Drawing
PRACTICAL		
6	DP-325	Surveying-I Lab
7	DP-326	Civil Engineering Materials Lab
8	DP-327	Engineering Geology Lab
9	DP-328	Strength of Material Lab
10	DP-329	Civil Engineering Drawing Lab

MATS School of Engineering & I.T
MATS University, Raipur
Diploma in Civil Engineering



IIIrd Semester

Sr. No.	Course code	SUBJECT	Periods per week			Evaluation Scheme		Total Credits
			L	T	P	IM	ESE	
THEORY								
1	DP-320	Surveying- I	4	0	-	30	70	4
2	DP-321	Civil Engineering Material	4	0	-	30	70	4
3	DP-322	Engineering Geology	3	0	-	30	70	3
4	DP-323	Mechanics of Structures	3	0	-	30	70	3
5	DP-324	Building Construction & Civil Engineering Drawing	4	0	-	30	70	4
PRACTICAL								
6	DP-325	Surveying-I Lab	-	-	2	20	30	1
7	DP-326	Material Technology Lab	-	-	2	20	30	1
8	DP-327	Engineering Geology Lab	-	-	2	20	30	1
9	DP-328	Strength of Material Lab	-	-	2	20	30	1
10	DP-329	Civil Engineering Drawing Lab	-	-	4	20	30	2
TOTAL			18	0	12	250	500	24

L-Lecturer, P-Practical, ESE- End Semester Examination, IM-Internal Marks, T- Tutorial

THIRD SEMESTER
SUBJECT: SURVEYING - I
SUBJECT CODE: DP-320

UNIT - I **Introduction**

Purpose of engineering surveys, Principles of surveying, Various instruments used for length and angular measurements, Plane and geodetic surveying.

UNIT - II **Chain Surveying**

Types of chain and tapes Study of 20m and 30 m chain, Accessories in chain surveying, Ranging methods- direct ranging, indirect/reciprocal ranging, Use of line range, Chaining on plane and sloping ground, Obstacles in chaining, offsets, Types of offsets, Use of offsets Instruments used to take offsets, Recording field book, chain traversing, base line, tie line, check line, and chain triangulation, Errors in chaining, tape and their correction, Symbols and signs to indicate ground features.

UNIT – III **Compass Surveying**

Types of compass prismatic and surveyors compass, Bearing of lines fore bearing and back bearing, Whole circle bearing and reduced bearing systems, Local attraction and its detection, Magnetic declination and dip Calculation of - exterior and interior angle, Closed and open traverse, closing errors, Graphical adjustment of closing error.

UNIT - IV **Leveling and Contouring**

Meaning of various terms used in leveling, Types of levels and their uses, Dumpy level, tilting level, quick set level, Auto-set level and digital level, Description of dumpy level, Temporary adjustment of level, Fundamental lines of levels and their relationships. Recording level book, Computation of reduced level by H.I. method and rise and fall method

Methods of leveling:

Simple leveling, fly leveling, differential leveling, reciprocal leveling, Longitudinal and cross sectioning, Computation of missing readings, Errors in leveling.

Contouring - Definition of contours, Contour interval, horizontal equivalent, Uses of contours, characteristics of contours, Methods of contouring, direct and indirect method of contouring,

Interpolation of contours, plotting of contour, use of Topo sheet

UNIT - V **Plane table Surveying**

Principles of plane table surveying, Plane table and its accessories, setting of plane table, Methods of plane table surveying, Suitability of each method, Plane table survey by radiation, Intersection and traversing, Advantages and disadvantages of plane table surveying .

Books Recommended:

1. Surveying Vol. I by B.C. Punmia & Ashok Jain
2. Surveying Vol. II by B.C. Punmia & Ashok Jain
3. Surveying Vol. I by S.K. Duggal
4. Surveying Vol II by S.K. Dugga

THIRD SEMESTER
SUBJECT: CIVIL ENGINEERING MATERIALS
SUBJECT CODE: DP-321

UNIT - I **Bricks & Stones**

Bricks : Classification , Dimension, Characteristics , moulding , Various Test on bricks. Fly ash bricks.
Mortar: Definition, properties and usages.
Stone: Geological, physical and chemical classification of stone, important stones, uses of stone.
Steel: Different between Cast-iron, wrought iron and steel, mild steel and Tor-steel.

UNIT -II **Cement, Aggregates & Concrete**

Raw materials, manufacturing process, Setting time, Vicat apparatus, Grades of cement, Pozzolana cement & its classification and uses, Fly ash.
Types of Cement, Hydration of cement, tests on properties of cement, ferro cement.
Aggregate: Classification of Aggregates and their properties, grading curve and fineness modules.
Concrete: Properties of concrete in fresh and hardened state, water cement ratio, Modulus of elasticity, factors affecting strength of concrete and durability, mixing, transporting, placing, compacting and curing concrete, variables in proportioning concrete mixes, admixtures in concrete, tests on concrete.

UNIT -III **Flooring & Roofing Materials**

Different types of floors used in building, Flag stone floor, Cement concrete floor, Mosaic flooring, Tile floors, Ceramic tile floor, Glazed tiling, Wooden floor, Glass floor.,
ROOFING MATERIALS, Roof covering materials - bamboo mats, galvanized iron sheets, corrugated types, asbestos
cement sheet, Plain and Trafford type tiles- Allahabad tiles, Manglore tiles, half round tiles, local country tiles.

UNIT -IV **Steel, Aluminum, Timber and Plywood**

Steel as engineering materials in different shapes, T section, Angle section, Channel section, I section, Steel sheets used in manufacturing of doors, Aluminium as construction material, Different uses of steel and Aluminium in building

Characteristics of good timber, seasoning and preservation, names of timber producing trees and their relative market value.

Types and uses of plywood, veneers and hardboards Low cost materials for construction. System concepts, cost effective materials, industrial wastes, agricultural wastes.

UNIT -V **Miscellaneous Materials**

Commercially available varieties of ceramics, glass and their uses, types of tiles, method of manufacturing and tests for suitability. Uses of Plastics and PVC. Composition and use of paints, varnishes and distempers. Composite materials, types and uses.

Use of material like glass, rubber, tar, emulsion, bitumen, glass wool, Use of J bolts, U hooks, Stoneware pipes, Galvanized iron pipes, Paints, Varnishes, Colour, Fire proofing materials, Acoustic materials, Thermal insulating material (glass wool), Water proofing material.

Name of Reference Book :

1. Building Materials – S.K. Duggal (New Age Publication)
2. Building Materials – S. C. Rangwala (Charotar Publication)
3. Engineering materials S.C. Rangwala
4. Engineering materials Deshpande
4. Engineering materials Ojha

THIRD SEMESTER
SUBJECT: ENGINEERING GEOLOGY
SUBJECT CODE: DP-322

UNIT -I **Minerals**

Minerals, their physical properties and chemical properties. The detailed study of certain rock forming minerals with respect to the physical properties.

Unit -II **Rocks and Rock deformation**

Their origin, structure, texture, classification of rocks in brief and their suitability as Engineering materials, dip and strike of bed, Folds, Faults, joints, unconformity and their classification, causes and relation to engineering behavior of rock masses.

Unit -III **Earthquake**

Earthquake, its causes, classification, seismic zones of India and Geological consideration for construction of building, reservoir related, earthquake problem and its preventive measures, distribution of seismic zones in India.

Unit -IV **Landslides and Land subsidence**

Landslides, its causes, classification and preventive measures, land subsidence, its causes and preventive measures.

Unit -V **Engineering Geological Sites Selection**

Engineering Geological considerations for site selection of Dams and Reservoirs, Tunnels, Bridges and Highways, Geological Maps, concept of geological maps, important terminology used for map and making a section from the map.

Name of Reference Books:

1. Geology and Engineering : Leggot, R.F. (Mc-Graw Hill, New York)
2. Geology for Engineers : Blyth, F.G.M. (Arnold, London)
3. Civil Engineering Geology : Cyril Sankey Fox (C. Lockwood and son, U.K.)

THIRD SEMESTER
SUBJECT: MECHANICS OF STRUCTURES
SUBJECT CODE: DP-323

UNIT -I **Introduction**

Type of structures, Structural components like slab beam, Column and footing, Strength & stiffness to resist failure., Concept of stress and strain, Types of stress and strain, Elasticity, elastic body, Internal resistance, Elongation and contracts in length, Tensile test on mild steel, Working stress and factor of safety, Lateral strain, Poisson's ratio, Change in lateral dimensions and volume, Modulus of rigidity, Relationship between C, E and K., Suddenly applied load and corresponding stress/strain, Strain energy, Resilience, proof resilience, modulus of resilience.

UNIT -II **Compound Stresses and Strains**

Stresses on inclined plane with different stress conditions, Principal planes and principal stresses, Analytical method and Graphical method using Mohr's stress circle method., Types of support with reaction, Types of beam – statically determinate/ indeterminate, Cantilever, Simply supported, overhanging beams, Computation of support reactions for point loads and u.d.l., Definition of B.M. and S.F. Sign convention beam., S.F & B.M diagrams for cantilever beam, Simply supported and overhanging beam, Point of contraflexure and its location, Deflected shape of the beam, Relation between B.M. and S.F. and Rate of loading.

UNIT-III **Slope and Deflection of Beams**

Concept of slope and deflection and their interrelation, Necessity of evaluation of slope and deflection, Macaulay's Method for determination slope and deflection, Maximum values for u.d.l. and point loads for Simply supported, cantilever and fixed beams

UNIT -IV **Fixed Beam**

Concept, Advantages & drawbacks, Computation of fixed end moments for a fixed beam for following loading (i) single point load central/eccentric (ii) two point loads (iii) u.d.l. over entire span., Drawing of B.M. diagrams indicating the maximum +ve and -ve values.

UNIT-V **Column**

End conditions and equivalent length, Radius of gyration and slenderness ratio, Classification mode of failure, Euler's and Rankin's formula, Use of Euler's and Rankin's formula in solving various problems.

Name of Reference Books:

1. Mechanics of Structures (Vol. – I) – S. & Gere (CBS Publishers)
2. Strength of Materials – Timoshenko,
3. Introductions to Solid Mechanics – Shames & Pitarresi (Prentice Hall of India)

THIRD SEMESTER
SUBJECT: BUILDING CONSTRUCTION & CIVIL ENGINEERING DRAWING
SUBJECT CODE: DP-324

UNIT - I Introduction to Building Construction & Drawing

Components of a structure, Sub/super structure, Types of structure, Framed & load bearing structure and comparison between the two, Site selection, Construction tool.

Various types of drawings, Importance and situations where above drawings are required., Types Of Projections;- First angle and Third angle projection., Symbols, conversions, and abbreviations commonly used in building drawing, Scales used for various types , Titles, margins, as per I. S. sizes of various standard drawing sheets

UNIT- II Foundation & Masonry

Importance of foundation, Necessity of foundation, Types of foundation, Trenches/pile type foundation, Empirical formula for design of foundations, Selection of foundation, Bearing capacity, Construction procedure, Timbering, dewatering of trenches, Type of piles, Shoring in soft soil, Lay out of building, Under-reamed piles, Timber pile, Precast pile, Concrete pile.

MASONRY:- Types of masonry, Comparison between different types of masonry, Uses of different types of masonry, Technical terms involved in masonry, Bond in bricks and stone masonry- Types and their merits.

UNIT- III Building Bye-Laws & Planning

Building bye-laws for residential buildings,, Industrial and commercial buildings.

Principles of Planning

Principles of planning of residential building for Room dimensions, Area, Heights, Privacy, Ventilation, Access, Circulation, Economy, Drainage aspect, Prospect, Orientation, Grouping etc., Principles of planning for school, hospital, post office, shopping centre, office building, industrial unit.

UNIT-IV Doors and Windows

Types and details of doors and windows, Materials used for doors and windows and their suitability, Sizes of doors and windows as per I.S. code, Selection criteria for doors and windows.

Detailed drawing of panelled door and window, Sketches of all types of doors and windows.

UNIT-V Stairs

Various terms used in stairs, Types of stairs and their suitability, Material used in construction of stairs, Relations between rise and tread, Empirical formula and I.S. code for rise and tread, Design of staircase for the given situation.

Name of Reference Book :

1. A course in Civil Engineering Drawing : V.B. Sikka (Katson Technical Publications)
2. Civil Engineering Drawing : Shah, Kala and Patki (Tata McGraw Hill)
3. Building Construction : B.C. Punmia (Laxmi Publication Pvt. Ltd.)
4. Building Construction : Sushil Kumar (Standard Publication Distributors)

THIRD SEMESTER
SUBJECT: SURVEYING-I LAB
SUBJECT CODE: DP-325

List of Practicals:

1. Determination of location of a point with the help of Two point problem.
2. Determination of location of a point with the help of Three point problem.
3. To plot a transverse of area by chain survey.
4. To plot a transverse of area by prismatic compass (open)
5. To plot a transverse of area by prismatic compass (close)
6. To workout relative elevation of various points on area by performing profile leveling.
7. To determine the elevation of a point with respect to reference by fly leveling.
8. Study of minor instruments.

THIRD SEMESTER
SUBJECT: MATERIAL TECHNOLOGY LAB
SUBJECT CODE: DP-326

List of Practicals:

1. Grading of Aggregate:-
 - a. Fineness modulus of fine aggregate.
 - b. Fineness modulus of coarse aggregate
 - c. Bulking of sand.
2. Test on bricks:-
 - a. Water absorption test.
 - b. Compressive strength of bricks.
3. Test for cement
 - a. Fineness test of cement.
 - b. Normal consistency of cement.
 - c. Setting time test initial and final.
 - d. Tensile strength.
4. Testing for steel
 - a. Tensile strength of M.S. bar.
 - b. Shear strength on M.S. bar.
5. Market survey
 - a. Study of different engineering materials used in construction work and their price.

THIRD SEMESTER
SUBJECT: ENGINEERING GEOLOGY LAB
SUBJECT CODE: DP-327

List of Practicals:

1. Megascopic description of Granite , Pegmatite , Synite
2. Megascopic description of Basalt , Gabbro , Charnokite , Dolerite
3. Megascopic description of Limestone , Sand-Stone , Shale
4. Megascopic description of Conglomerate , Marble, Slate
5. Megascopic description of Phyllite , Clay
6. Megascopic description of Quartzite , Schist , Gneiss
7. Megascopic description of Talc , Gypsum , Calcite
8. Megascopic description of Feldspar , Quartz , Corundum
9. Megascopic description of Garnet , Muscovite , Pyrite
10. Megascopic description of hematite , Megnatite , Bauxite
11. Megascopic description of Galena , Beryl , Chalcopyrite
12. Study of structural models of Fault , Fold and Unconformity
13. Study of simple geological map

**THIRD SEMESTER
SUBJECT: STRENGTH OF MATERIAL LAB
SUBJECT CODE: DP-328**

List of Practicals:

1. Determination of compressive strength of cement cube.

2. Determination of tensile strength of cement cube.
3. Determination of fineness of cement by sieving method.
4. Determination of fineness of cement by Blain Apparatus.
5. To determine Uniaxial tensile test of mild steel.
6. To determine Izod Charpy Value of given mild steel.
7. To determine the Rockwell Hardness of given material.
8. To determine Compressive strength of wood: (a.) Along the fiber and (b.) Across the fiber.
9. To study the cupping test machine and determination of Erichser value of mild steel sheet.
10. To determine the modulus of rigidity of material of given shaft.

THIRD SEMESTER
SUBJECT: CIVIL ENGG. DRAWING LAB
SUBJECT CODE: DP-329

List of Drawing Tutorials: Recommended plates to

1. Building drawing
 - Plan
 - Elevation

- Sections of one bed room and two bed room, residential building (2 sheets)
- 2. Plan, elevation and sections of a double storyed residential building (2 sheets)
- 3. Preparation of detailed plan
- 4. Elevation section of a public building (such as school, hospital, shopping centre etc.) referring to the given plan (3 sheets)
- 5. One plate on straight flight and open well, one plate for dog legged stair case
- 6. One sheet for timber truss including king post and queen post
- 7. One sheet for steel truss
- 8. One sheet for lean to roof with roof covering material used like tiles, half round tiles, G.I. sheets A.C. sheets
- 9. Building services and their connections- one sheet, showing layout plan for water supply and sanitary arrangements
- 10. One sheet showing layout plan for electricity connections
- 11. Modification of existing building one sheet.

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