PART- II
(3rd & 4th Sem.)

CURRICULUM OF DIPLOMA PROGRAMME ON

CIVIL ENGINEERING (CE)

IN

MULTI POINT ENTRY & CREDIT SYSTEM

For the State of Nagaland

Path Finder for Excellence in Technical Education

National Institute of Technical Teachers' Training & Research, Kolkata
Block – FC, Sector – III, Salt Lake City, Kolkata – 700 106
http://www.nitttrkol.ac.in

SAMPLE PATH: TERM - III

Sl. No	Code	Course	Study Scheme				Evaluation Scheme							Total Marks	Credit
			Pre-requisite	Contact Hours / Week			Theory				Practical				
				L	T	P	End Exam	Progressive Assessment			End Exam	Progressive Assessment			
								Class Test	Assignment	Attendance		Sessional	Viva-voce		
1	CE401	Mechanics of Material	G206A	3	0	2	75	10	10	5	0	50	0	150	4
2	CE402	Civil Engg Drawing I	G201 G202	1	0	3	0	0	0	0	50	50	0	100	3
3	CE404	Surveying -I		3	0	4	75	10	10	5	25	25	0	150	5
4	CE405	Building Construction		3	1	0	75	10	10	5	0	0	0	100	4
5	CE406	Concrete Technology		3	0	2	75	10	10	5	25	25	0	150	4
6	G105	Applied Mathematics	G103 G104	3	1	0	75	10	10	5	0	0	0	100	4
7	G207	Fundamentals of Electrical & Electronics Engineering		3	0	2	75	10	10	5	25	25	0	150	4
8	G302	Development of Life Skill - II		1	0	2	-	-	-	-	-	25	25	50	2
9	CE513	Professional Practices - II		0	0	2	-	-	-	-	-	50	0	50	1
TOTAL				20	2	17	450	60	60	30	125	250	25	1000	31

SAMPLE PATH: TERM - IV

Sl. No	Code	Course	Study Scheme				Evaluation Scheme							Total Marks	Credit
			Pre-requisite	Contact Hours / Week			Theory				Practical				
				L	T	P	End Exam	Progressive Assessment			End Exam	Progressive Assessment			
								Class Test	Assignment	Attendance		Sessional	Viva-voce		
1	G303	Soft Core I		3	0	0	75	10	10	5	0	0	0	100	3
2	CE403	Civil Engg Drawing II	CE402	1	0	3	0	0	0	0	50	50	0	100	3
3	CE503	Surveying-II	CE403	3	0	3	75	10	10	5	0	25	0	125	5
4	CE407	Hydraulics		3	1	2	75	10	10	5	25	25	0	150	5
5	CE501	Design & Detailing I	CE405	3	0	2	75	10	10	5	0	25	0	125	4
6	CE504	Estimating I		2	0	4	75	10	10	5	0	25	0	125	4
7	CE508	Computer Aided Drawing	CE402	0	0	3	0	0	0	0	0	50	0	50	2
8	CE408	CE Workshop		0	0	3	0	0	0	0	0	50	25	75	2
9	CE514	Professional Practices – III		0	0	2	0	0	0	0	0	50	0	50	1
TOTAL				15	1	22	375	50	50	25	75	300	25	900	29

TERM - III

Name of the course : MECHANICS OF MATERIAL	
Course code: CE401	**Semester : THIRD**
Teaching Scheme	**Maximum Marks : 150**
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 15 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 5 Marks Attendance : 5 Marks Sessional : 50
Practical : 2 hrs/week	End Semester Theory Exam:75 Marks
Credit : 4	

Rationale:

Mechanics of Materials deals with the internal behaviour of variously loaded solid bodies, such as; shafts, bars, beams, plates, and columns, as well as structures and machines that are assemblies of these components.Mechanics of material focusesprim arily on mechanical properties of materials, analysis of stress, strain and evaluation of deformations. The subjects like structural analysis, design of structures as well Asmachinesare based on adequate knowledge and understanding of Mechanics of Materials. Therefore, it is an important basic subject for Diploma students in Civil and Mechanical Engineering.

Course Objective :-

Module/ Unit	After completion of the course, students will be able to:
1.	Solve simple problems related to stress and strains.
2.	Draw SFD and BMD for different types of beams- simply supported and cantilever.
3.	Solve simple problems related to theory of pure bending.
4	Find out slope and deflection of different types of beams under different loading conditions.
5	Solve problems related to columns and struts Using Euler's equation.
6	Solve problems related to torsion.

Pre-Requisite :-

1.	Class X with Science (Physics, Chemistry and mathematics), concept of engineering mechanics.

Contents (Theory)		Hrs	Marks in %
UNIT - I	**1.0 INTRODUCTION** 1.1 Uses of structures, Importance of knowledge of: stress, strain, and deformation in a structure, Permissible stresses in a material, Safety and Economy. Contents and importance of the subject 1.2 Engineering Materials:Elastic material, linearly elastic material, ductile material, brittle material, composite material, isotropic material, orthotropic material (Definition, examples and application)	4	5
UNIT-II	**2.0 SIMPLE STRESSES AND STRAINS:** 2.1 Properties of materials – Elasticity, Plasticity, Hardness, Toughness, 2.2 Brittleness, Ductility, Creep, Fatigue. 2.3 Stress, strain, Elongation, Types of stresses & strains, Elastic limit, Hooke's law - Stress strain diagram – working stress, Yield stress, Ultimate stress & breaking stress, Factor of safety. 2.4 Linear strain, lateral strain, volumetric strain & Poisson's ratio, Elastic constants-Young's modulus, Rigidity modulus & Bulk modulus and their relations (no derivation). 2.5 Bars of varying cross section (Excluding tapering section). 2.6 Composite sections. 2.7 Temperature stresses and strain (simple sections). 2.8 Strain energy, resilience, proof resilience and modulus of resilience, Types of loading. Equation for strain energy stored in a body. 2.9 Simple problems.	12	20
UNIT - III	**3.0 ANALYSIS OF BEAMS:** 3.1 Beam: definition, types of beams – Simply supported and cantilever beams, propped cantilever, fixed-ended and continuous beams. 3.1.1 Identify different types of beams and loading conditions. 3.1.2 Determine the support reactions and draw the free body diagram of a determinate beam. 3.2 Shearing force and Bending Moment in Beams : Sign conventions and relationships among load, shearing force and bending moment. 3.3 Shear Force and Bending Moment Diagrams :	15	25

	Cantilever beam with concentrated and uniformly Distributed load, simply supported beam with uniformly distributed and varying loads.		
UNIT - IV	**4.0 THEORY OF SIMPLE BENDING** 4.1 Bending stress, neutral axis, Theory of pure bending Equation for bending (no derivation)- Assumption. 4.2 Determine the moment of inertia, section modulus and moment of resistance of a beam cross-section. Determine the bending stresses in a beam under bending. 4.3 Definition of Flexural rigidity, Modulus of rupture. 4.4 Simple problems.	4	10
UNIT - V	**5.0 SLOPE AND DEFLECTION OF BEAMS (by Moment area method only)** 5.1 Introduction -deflection, slope and curvature. 5.2 State and explain Mohr's theorem. 5.3 Slope and Deflection of cantilever with point load at free end and uniformly distributed load. 5.4 Slope and Deflection of simply supported beam with central point load and u d l. 5.5 Simple problems.	7	15
UNIT - VI	**COLUMNS AND STRUTS** 6.1 Introduction- columns, struts, effective length of column for different end condition, slenderness ratio, long & short columns and Crippling load. 6.2 Euler's equation (no derivation) & assumptions. 6.3 Simple problems.	3	5
UNIT - VII	**TORSION** 7.1 Basic assumptions for pure torsion, torsion of circular shafts (hollow and solid, no proof) – polar moment ofinertia, torsional shearing stress angle of twist, torsional rigidity. 7.2 Torsion equation (no derivation), Torsional rigidity, Torsional equation for solid and hollow circular shafts. 7.3 Power transmitted by solid and hollow shafts. 7.4 Simple problems.	3	10
PRACTICAL	**LIST OF EXPERIMENTS/ DEMONSTRATIONS** 1. Deflection test 2. Torsion test	32	50

	3. Tension test 4. Hardness test : a. Brinell Hardness test. b. Rockwell Hardness test. Impact test: a. Izod Impact test. b. Charpy Impact test. 6. Rotating Fatigue test.		
	Total	80 hrs	100

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
S. P. Timoshenko , D. H. Young	Elements of Strength of materials		Affiliated East – West Press Private Limited.
R. K. Bansal	Engineering Mechanics and Strength of materials		Laxmi Publications , New Delhi
S. Ramamrutham	Engineering Mechanics & Strength of Materials		Dhanpat Rai Publishing Co., Delhi – 110 006.
A. C. Ugural	Mechanics of Materials		Mc. Graw Hill. Inc

Name of the course : CIVIL ENGINEERING DRAWING- 1	
Subject code: CE402	**Semester : THIRD**
Teaching Scheme	**Maximum Marks : 100**
	PA and End Examination Scheme
Theory : 1 hrs/week	Class test: 0 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 0 Marks Attendance : 0 Marks Sessional: 50
Practical : 3 hrs/week	End Semester Theory Exam: 0 Marks End Semester PA Exam: 50 Marks
Credit : 3	

Rationale:

Drawing is the language of Engineers. The diploma technicians working on site are required to refer drawings and specifications for executing civil engineering works/structures. Hence civil engineering drawing is a course which every civil engineering technician should learn and develop skills to become successful in their profession. This course is a basic essential course and is the backbone of all Civil Engineers. No technician can supervise or guide civil engineering construction without thorough knowledge and practice of preparing civil engineering drawings. If a technician is able to prepare drawings, he can interpret drawings, which ultimately will help him to execute or carry out construction work precisely and also estimate the quantities correctly.

Course Objective :-

Module/Unit	After completion of the course, students will be able to visualize, draw and read:
1.	Plan section and elevation of wall footing and column footing.
2.	Plan section and elevation of different types of doors.
3.	Plan section and elevation of different types of stair cases
4	Elevation of roof trusses.
5	Plan section and elevation of single storied R.C.C. building with detail.
6	Plan section and elevation of different types of bonds

Pre-Requisite :-			
1.	Class X with Science (Physics, Chemistry and mathematics), concept of engineering drawing		
	Contents (Theory)	Hrs.	Marks in %
UNIT - I	**INTRODUCTION** 1.1 Different symbols used in Civil Engg. R.C.C work, Earth work, Glass work, Cross section of door and windows. 1.2 Foundation layout, footing.	6	4
UNIT II	**BUILDING BYE-LAWS** 2.1 Building bye-laws for residential buildings 2.2 Building bye-laws for industrial buildings 2.3 Building bye-laws for commercial buildings (as per IS recommendations) 2.4 Following important bye-laws for above three types 2.4.1 Plot area & built up area, size of rooms, margins 2.4.2 Circulation, open space, water supply and sanitary 2.4.3 Electrification, fire safety, other safety 2.4.4 Lifts environment 2.4.5 Approval procedures with respect to bye-laws.		
UNIT III	**PRINCIPLES OF PLANNING** 3.1 For Buildings (residential and other types of buildings)Principles of planning such as room, dimension, area, heights, privacy, ventilation, access, circulation, economy, drainage, aspects, prospect, orientation grouping etc. 3.2 Principles of planning for school, hospital, bank, post office, shopping centre, office building, industrial unit etc		

UNIT- IV	**DOORS AND WINDOWS (ELEVATION AND SECTION)** 2.1 Elevation and sectional plan of doors. 2.1.1 Panelled and fully glazed door. 2.1.2 Battened and ledged door. 2.2.3 Flush door. 2.2 Windows 2.2.1 Fully glazed, fully paneled, ledged and braced.(aluminum and steel)	6	10
UNIT - V	**STAIR CASE** 3.1 Sectional plan and elevation of stair cases. 3.1.1 Straight type. 3.1.2 Dog legged type. 3.1.3 Open well type. 3.1.4 Bifurcated, half turn stair case. 3.1.5 Quarter turn stair case.	16	10
UNIT - VI	**ROOF TRUSS** 4.1 Draw the elevation of roof trusses. 4.1.1 King post. 4.1.2 Queen post. 4.1.3 Steel roof truss.	10	5
UNIT - VIII	**BONDS** 6.1 Draw the different types of bonds, header, types of closers.	8	
UNIT - VII	**R.C.C. BUILDING (DETAILED PLAN AND SECTIONAL ELEVATION OF ONE STORIED R.C.C. BUILDING)** 5.1 Details of Plan, section and elevation of a R.C.C residential building.	18	15
	Total	64 hrs	50
S.no.	Skills to be developed		
1	**Intellectual skills-** 1. Use of equipment in correct manner. 2. Draw correct margin lines. 3. Accuracy while drawing lines. 4. Follow instructions properly**.**		

2	**Motor skills-** 1. Use proper drawing sheets. 2. Use proper drawing tools.		
3	**Social skills-** 1. Will learn to work with peer as group. 2. Able to communicate with teachers and peers to clarify doubts.		

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
B. P. Verma	Civil Engineering Drawing & home planning		
Agarwal and Agarwal	Engineering drawing		TMH
R.B. Gupta	Engineering drawing		Satya Prakashan Delhi
Saha/Rana	Engineering drawing		Pearson

Name of the course : SURVEYING-I	
Course code: CE404	**Semester : Third**
Teaching Scheme	**Maximum Marks : 150**
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 10 Marks Attendance : 5 Marks Sessional : 25 marks
Practical : 4 hrs/week	End Semester Theory : 75 Marks Practical End Exam: 25 Marks
Credit : 5	

Rationale:

Surveying is an essential component of the day to day work of a Civil Engineering Technician. The job includes conducting detailed surveying, plotting of survey data, preparation of survey maps etc. In view of its importance the course content has been divided into 2 parts and introduced sequentially as Surveying-I. Each theory course is accompanied by practical course work to provide hands on experience.

The course content of Surveying-I includes the basic concept of surveying, horizontal linear and angular measurements and conducting surveys involving horizontal linear and angular measurements with stress on familiarization with various equipment used. It also includes vertical linear measurements to indicate the profile of the land surface by levelling has also been covered in details

Course Objective :-

Module/Unit	After completion of the course, students will be able to:
1.	Explain the importance of surveying in civil engineering.
2.	Classify methods of surveying. Use surveying instruments to measure distances, bearings and elevations.
3.	Workout problems related to compass, levels, chain and plane table
4	Find out different sources of errors and rectify them.
5	Carry out survey and prepare maps using the data collected.

6	Identify the instrument required for particular survey work.		
7	Preparing contour maps from field data.		
Pre-Requisite :-			
1.	Class X with Science (Physics, Chemistry and mathematics), concept of engineering mechanics.		
	Contents (Theory)	Hrs	Marks in %
UNIT - I	**BASIC CONCEPT AND GENERAL INTRODUCTION** 1.1 Broad aims definition, uses, Principles and classification of survey 1.2 Basic instruments for surveying: Pegs, arrows, ranging rods, ranging poles, Cross staff, optical square, plumb bob, chain, tape.	4	5
UNIT- II	**CHAIN SURVEY** 2.1 Definition, principles and use of chain survey. 2.2 Selection of station, base line, check line, tie line, kinds of offsets, obstacles in chaining, chaining on sloping ground 2.3 Errors in chain survey: Incorrect ranging, limiting length of offset, error in length, area and volume due to incorrect chain, cumulating and compensating error, tape correction, simple problems	9	10
UNIT - III	**COMPASS SURVEY** 3.1 Introduction to compass surveying 3.2 Types of compass: Prismatic and Surveyor's compass, basic differences between prismatic and surveyor's compass, basic difference between chain and compass surveying, open and closed traversing 3.3 Bearing of lines, type of meridians, whole circle and quadrantal system of bearing, fore and back bearing, reduced bearing, 3.4 Local attraction, dip of the needle and magnetic declination, variation in magnetic declination, relation between true bearing and magnetic declination, error and precautions in compass survey, numerical problems. 3.4 Traversing by compass, plotting of traverse, closing error, simple problems.	15	25

UNIT - IV	**LEVELLING** 4.1 Definition of terms used in levelling: level surface, horizontal surface, vertical surface, datum, reduced level (RL), bench mark (BM). 4.2 Types of levelling instruments: essential features and uses, definition of line of collimation, axis of bubble tube, axis of telescope, vertical axis, levelling staff- types 4.3 Temporary adjustments of level, taking reading with level 4.4 Definition of BS, IS, FS, CP, HI 4.5 Principles of levelling, different types of levelling, calculation of reduced level by height of collimation and rise & fall method 4.6 Effects of curvature and refraction, simple problems 4.7 Difficulties in levelling, errors in levelling and pre-cautions	12	25
UNIT - V	**CONTOURING** 5.1 Definitions of related terms, concepts of contours, characteristics of contours 5.2 Methods of contouring, plotting contour maps 5.3 Interpretation of contour maps, toposheets 5.4 Use of contour maps in engineering projects - drawing cross-sections from contour maps, locating proposed routes of roads/railway/canal on a contour map, computation of volume of earthwork from contour map for simple structures	8	10
PRACTICAL	**LIST OF EXPERIMENTS/ DEMONSTRATIONS** **1.0 CHAIN SURVEY** 1.1 Handling and uses of chain, tape, cross-staff, optical and other related instruments and accessories. 1.2 Ranging and measurement of lines by chain and tape 1.3 Laying and measurement offset by various methods 1.4 Chain survey of an area containing simple details and plotting the survey.	64	
	2.0 COMPASS SURVEY 2.1 Reading Fore bearing and back bearing 4 2.2 Measurement of included angle 2.3 Compass survey of a plot of land making it closed traverse 2.4 Plotting of compass survey after making correction for local attraction		

	3.0 LEVELLING 3.1 Reading of staff 3.2 Setting up a levelling instrument and finding difference of level by fly levelling 3.3 Conducting of longitudinal levelling and cross-section levelling of a proposed road of 500m taking L- section at 20m. 3.4 Plotting of survey from field book and level book		
	4.0 CONTOURING: 4.1 To prepare a contour map for a given plot by. 4.1.1 Direct method. 4.1.2 Indirect method (grid method). **5.0 SURVEY CAMP** 5.1 There should be survey camp duration outside the campus, especially in an underdeveloped area using all modern instruments		
		Total	112 hrs	150

S.No	Skills to be developed
1.	**Intellectual skills-** 1. Use of equipment in correct manner. 2. Accuracy while positioning of instrument, observing and taking readings. 3. Follow safety instructions properly. 4. Accurate plotting of maps with the help of field data.
2.	**Motor skills-** 1. Operate instruments properly. 2. Use proper marking tools.
3	**Social skills-** 1. Will learn to work with peer as group. 2. Able to communicate with teachers and peers to clarify doubts.

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
B.C.Punmia	Surveying vol-1		Tata Mc. Grawhill

T.P Kanetkar	Surveying and levelling		
Hussain and Nagaraj	Surveying		
S.K Duggal	Surveying and levelling		

Name of the course: **BUILDING CONSTRUCTION**	
Course code: CE 405	Semester: 3rd
Teaching Scheme	Maximum Marks: **100** Progressive Assessment and End Term Exam Scheme:
Lecture: 3 hrs/week	Class Test: 10 Marks
Tutorial: 1 hrs/week	Assignment/ Quiz etc: 10 Marks Attendance: 5 Marks
Practical: 0 hrs/week	End Semester Theory Exam: 75 Marks
Credit: 4	End Semester Practical Exam:

Rationale:

The subject of building construction is very important for the diploma holders in Civil Engineering. The course material has been designed for the students to know the properties of the building construction as well as the strength of the material as per IS code of practice. Further, practical input has been given for augmenting the learning by the students

Course Outcomes:	
Module/ Unit:	After completion of the course, students will be able to:
1	Identify different types of buildings along with that desire orientation.
2	Ascertain different types of foundation
3	Understand the brick and masonry building
4	Identify different types of flooring and roofing used in buildings
5	Know different terms and types of stair
6	Identify different types of surface finishes and paintings
7	Understand the concept of ventilation and fire protection of buildings

Pre-Requisite:

Content (theory) Marks in %		Hrs	
Unit-I	INTRODUCTION 1.1 Classification of building based on occupancy. 1.2 Orientation of Buildings 1.2 Different parts of building and their requirements.	2	4

Unit-II	SITE INVESTIGATION: 2.1Object of site investigation (exploration) 2.2 Method of site investigation. Brief description of site reconnaissance (Inspection of site), boring methods. 2.3Methods for determining the bearing capacity of soil	3	3
Unit-III	FOUNDATIONS: 3.1Definitions and purpose of foundation. 3.2Essential requirements of foundations. 3.3Type of foundation – shallow foundations and deep foundations and their classifications. 3.4Shallow foundation- construction and details of spread foundations for walls, combined footings, raft foundation (with sketches). 3.5 Deep foundations-pile foundation- types, classification and their relative merits and demerits, pier or well foundations.	4	5
Unit-IV	BRICK MASONRY: 4.1 Definition: Materials used in brick masonry, general principles to be observed in brick masonry. 4.2Definition of terms- mortar, bond, header, stretcher, bed, bat, closer, bull,nose, frogs, course, bed joints, cross joints, quoin, facing.	4	5

Unit-V	STONE MASONRY 5.1 Uses, comparison between stone masonry and brick masonry. 5.2 Materials used in brick masonry. 5.3 Technical terms used in stone masonry. 5.4 Types of stone masonryRubble masonry and ashlars masonry, their description with classification.	4	5
Unit-VI	PARTITION WALLS & CAVITY WALLS 6.1Definition of partition and cavity wall. 6.2Advantage of cavity wall. 6.3Types of partition walls- Brief description of brick partitions, concrete partitions only	5	5
Unit-VII	ARCHES AND LINTELS 7.1Meaning and use of arches and lintels. 7.2Technical terms in arches and lintel 7.3Classification of lintels	3	6
Unit-VIII	DOORS AND WINDOWS 8.1Glossary of terms used in doors and windows. 8.2Door-use, types of doors(description with sketches) 8.3Window-use, types of windows (description with sketches)	4	6
Unit-IX	DAMP PROOFING 9.1Definition of dampness, defects of dampness, causes of dampness. 9.2Sources of dampness, prevention of dampness, 9.3Materials used for damp proofing.	4	5
Unit-X	FLOORS		

	10.1 Ground floor- definition, types of ground floors (name) description of concrete flooring, Mosaic flooring, terrazzo flooring 10.2 Selection of a suitable type of floor	4	5
Unit-XI	STAIRS: 11.1Definition, location of stairs. 11.2Common technical terms used in stairs construction. 11.3Requirements of good stairs. 11.4Classification of stairs (brief description with diagram)	4	5
Unit-XII	ROOFS 12.1Types of roofs, description of sloping roofs, flat roofs. 12.2King post and Queen post truss	4	5
Unit-XIII	SURFACE FINISH 13.1Plastering – definition, materials used for plastering, application of plaster, defects in plastering 13.2Pointing- definition, types of pointing, preparation of surface, Mortar use	4	5

Unit-XIV	VENTILATION 14.1Purpose and factors to be considered 14.2Methods of ventilation	4	5
Unit-XV	FIRE AND ITS PROTECTION 14.1Types of construction for Fire Resistance 14.2Type of Exits 14.3Fire Protection	4	5
Unit-XVI	PAINTING, DISTEMPERING AND WHITE WASHING	3	5
	Total	60	75
Practical:NA			
Sl.No	Skill to be developed		
1	Intellectual Skill:		
2	Motor Skill:		
3	Social Skill:		
Text/ Reference Books:			
Name of the authors	Title Edition Publisher		
D.N.Ghoh, :Tata Mc-Grew Hills	Materials of Construction		

Rangawala	Text book of materials
Shri S.K. Basu and Shri A.K. Ray;: S.K. Lahiri & Co. (P)Ltd	Building Materials
T.T.T.I,Chandigarh, Tata McGraw Hills	Civil Engineering Materials
S K Sharma, S Chand and Company Pvt. Ltd	A Textbook of Building Construction

Name of the course : CONCRETE TECHNOLOGY	
Course code: CE406	**Semester :**
Teaching Scheme	**Maximum Marks : 150**
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 10 Marks Attendance : 5 Marks Sessional : 25
Practical : 2 hrs/week	End Semester Theory Exam: 75 Marks
Credit : 4	Practical Exam: 25 Marks

Rationale / Aim :-

Concrete is used as the most important construction material throughout the world. It is unique in the sense that it is produced in-situ with locally available raw materials and a team of labours. For producing good quality concrete knowledge of concrete technology is a must and hence this subject is very important for civil engineering diploma holders.

Course Objective :-

Module/Unit	After completion of the course, students will be able to:
1.	Appreciate the role of concrete in Civil Engineering
2.	Identify the basic ingredients of concrete and their properties in concrete making including selection of the suitable materials and their relative proportioning for producing good quality concrete
3.	Perform experimentation on concrete materials and on concrete for assessing their quality and acceptability
4.	Interpret the impact of concrete, which is the second largest material with respect to per capita consumption in the world, on the society including its environmental and ecological aspects
5.	Implement the concept of concrete making to a construction site as efficiently as possible
6.	Update oneself regularly with latest technological developments in this field as the knowledge in this field is expanding in leaps and bounds

Pre-Requisite :-

1			
Contents		Hrs.	Marks in %
UNIT - I	**1.0 INTRODUCTION** 1.1 Concrete as a construction material- Grades of concrete, advantages and disadvantages of concrete	3	5
UNIT-II	**2.0 MATERIALS FOR CONCRETE** 2.1 Chemical composition of cement, hydration of Cement, heat of hydration. 2.2 Properties of Portland cement – ordinary, rapid hardening, low-heat, sulphate resisting, Portland slag, Portland pozzolana, super sulphated cement, white cement. 2.3 Tests on Cement and Cement Paste – fineness, consistency, setting time, soundness, compressive strength. 2.4 Use of IS code Specifications- 4031, 4032, 269, 8116, 12269 and 455 2.5 Aggregates – Classification, mechanical and physical properties, deleterious substances, alkali-aggregate reaction, fineness modulus, grading of aggregate. IS code specifications- IS 2386, IS 383 2.6 Water – quality of mixing water, curing water, use of IS code 2.7 Admixtures –Important functions, classification of admixtures, accelerating, retarding, air entraining admixtures. water reducing admixture and Super plasticizers,. IS 9103	15	5
UNIT - III	**3.0 PROPERTIES OF CONCRETE** 3.1 Concept of fresh concrete, Workability, Factors affecting workability, 3.2 Measurement of workability- Slump test, compacting factor test, flow table test, vee-bee consistency test 3.3 Segregation and Bleeding of concrete, 3.4 Hardened concrete- water cement ratio and effect of age on strength, flexural strength of concrete, stress strain relationship with different elastic modulli phenomena of creep and shrinkage, permeability, durability of concrete, sulphate and acid attack on	15	8

	concrete, efflorescence. 3.5 Testing of concrete- Destructive and non-destructive test on hardened concrete, cube and cylinder test, flexural tensile strength of concrete, some common nondestructive test like rebound hammer and USPV test 3.6 Production of concrete – Batching, mixing, transporting, placing, compacting, Curing of concrete, mixers and vibrators, Use of relevant Clauses of IS 456		
UNIT IV	**4.0 MIX DESIGN FOR CONCRETE** 4.1 Requirements of material, workmanship, inspection testing and acceptance criteria as per IS:456, Section 2 4.2 Mix design-concept, parameters to be considered in mix proportioning-Mix deign methods-Mix design using I.S.code method (10262- 2009)	10	12
UNIT V	**5.0 SPECIAL CONCRETE:** 5.1 High strength concrete, high performance concrete and fly ash concrete, polymer concrete – Fiber reinforced Concrete-self compacting concrete, Ready mix Concrete 5.2 Applications -advantages and limitations.	5	10
PRACTICAL	**LIST OF EXPERIMENTS/ DEMONSTRATIONS** 1.0 TESTS ON CEMENT AS PER IS CODES 1.1 Determination of Fineness by Surface area (Blaine air Permeability app.) 1.2 Determination of Specific gravity 1.3 Normal Consistency 1.4 Initial setting and final setting time 1.5 Test on compressive strength of Cement (Mortar Cube) 1.6 Soundness of cement – Le-Chatelier and Autoclave	32	50
	2.0 TESTS ON AGGREGATE AS PER IS CODES 2.1 Sieve Analysis of Fine and Coarse Aggregates for Gradation 2.2 Specific gravity of Aggregates 2.3 Bulking of sand		

	2.4 Water absorption of coarse & fine aggregate 2.5 Elongation & flakiness index 2.6 Test on deleterious material 2.7 Test on alkali aggregate reaction		
	3.0 TESTS ON CEMENT CONCRETE AS PER IS CODE 3.1 Slump test 3.2 Compaction factor test 3.3 Casting Concrete cubes and cylinders 3.4 Compressive strength of concrete cubes and cylinders 3.5 Split Tensile Test on concrete Cylinder 3.6 Flexural tensile strength of concrete 3.7 Non- destructive test- rebound hammer, USPV IS:13311		
	Total	90 hrs	100%
Practical :-			
S.No	**Skills to be developed**		
1.	**Intellectual skills-** 1. Use of equipment in correct manner. 2. Accuracy while positioning of instrument, observing and taking readings. 3. Follow safety instructions properly.		
2.	**Motor skills-** **1.** Operate instruments properly. **2.** Use proper marking tools.		
3	**Social skills-** 1. Will learn to work with peer as group. 2. Able to communicate with teachers and peers to clarify doubts		
Text /Reference Books:			
Name of Authors	Titles of the Book	Edition	Name of the Publisher

M. L Gambhir	Concrete Technology		
M S Shetty.	Concrete Technology		
Neville	Properties of concrete		
Neville & Brooks	Concrete Technology		Pitman Pub. Ltd
Santhakumar	Concrete Technology		

Name of the course : APPLIED MATHEMATICS	
Course code: G105	**Semester :**
Teaching Scheme	**Maximum Marks : 100**
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks
Tutorial: 1 hrs/week	Assignment / Quiz etc.: 10 Marks Attendance : 5 Marks Sessional : 0 marks
Practical : 0 hrs/week	End Semester Theory : 75 Marks Practical End Exam: 0 Marks
Credit : 4	

RATIONALEE: - Mathematics is an important tool to solve wide variety of engineering problems. Most of the technological processes in industry are described effectively by using mathematical framework. Mathematics has played an important role in the development of mechanical, civil, aeronautical and chemical engineering through its contribution to mechanics of rigid bodies, hydrodynamics, aero-dynamics and heat transfer etc.It has become of great interest to electrical engineers through its application to information theory, design of digital computer etc

Course outcomes

Module/Unit	After completion of the course, students will be able to:
1	Apply the knowledge of interpolation and integration in the civil engineering field
2	Solve the differential equations
3	Know about the graph theory
4	Solve the problems about the discrete mathematics

Pre requisite: G103

UNIT	TOPIC/SUB-TOPIC	Contact Hrs.	Total Marks.
1.0	**Numerical Analysis** **1.1 Interpolation.** (i) Introduction to interpolation. (ii) Lagrange's interpolation formula. (iii) The operators Δ, ∇ and E .Relation between them. (iv) Difference Table. (v) Newton's forward and backward interpolation		

	formula. (vi) Concept of extrapolation. **1.2 Numerical Differentiation and Integration.** (i) Newton's forward and backward difference formula for differentiation $\left(\frac{dy}{dx}, \frac{d^2y}{dx^2}\right)$ at any point at $x = x_0$ *or* $x = x_n$ **1.3 Numerical Integration**. (i) Trapezoidal rule and Simpson's $\frac{1}{3}$ rd rule. **1.4 Numerical Solution of Ordinary Differential Equation** (i) Introduction. (ii) Runge Kutta's 2^{nd} and 4^{th} order methods.	**15**	**20**
2.0	**Differential Equations (ordinary)** (i) Introduction. (ii) Order and degree of a differential equation. (iii) Formation of Differential Equations. (iv) Solution of a Differential Equation. (v) Differential equation of the first order & first degree. (vi) Variables separable. (vii) Homogeneous Differential Equations. (viii) Linear Differential Equations. (ix) Equations reducible to linear form. (x) Exact differential Equations. (xi) Equations reducible to the exact form. (xii) Linear Differential Equations of second order with constant coefficients. (xiii) Complete solution = Complementary Function + Particular Integral. (xiv) Method of finding Particular Integral. (xv) Applications of differential equations to electrical circuit problems. (xvi) Problems related to other physical systems.	15	15

3.0	**Graph Theory** (i) Introduction. (ii) Basic Terminology. (iii) Simple Graph, Multigraph and Pseudo graph. (iv) Degree of a Vertex. (v) Types of Graphs. (vi) Subgraphs and Isomorphic Graphs. (vii) Operations of Graphs. (viii) Paths, Cycles and Connectivity. (ix) Eulerian and Hamiltonian Graph. (x) Shortest Path Problems using known Algorithm (xi) Representation of Graphs. (xii) Planar Graph. (xiii) Graph Colouring.	20	20
4.0	**Discrete Mathematics** 5.1 The principle of Inclusion and Exclusion with examples. 5.2 Generating Functions. (i) Introductory examples. (ii) Definition & examples of Calculation Techniques. (iii) Partition of integers with problems. (iv) Exponential Generating function with problems. 5.3 Recurrence Relations. (i) First order linear recurrence relations (ii) Second order linear homogeneous recurrence relations with constant coefficients. (iii) Non-homogeneous recurrence relations. (iv) Method of generating functions (v) Problems on all the above topics.	10	20
		Total hours	Total marks
		60	70

Reference Books.

(1) Integral Calculus by B.C.Das and B.N.Mukherjee.
(2) Diploma Engineering Mathematics (Volume-II) by B.K.Pal.
(3) Applied Mathematics-I by Dr.J.S.Bindra and K.S.Gill.
(4) Applied Mathematics-II by Dr.J.S.Bindra and K.S.Gill.
(5) Applied Mathematics-III by Dr.J.S.Bindra.
(6) Engineering Mathematics (Volume-I, Volume-II & Volume-III) by S.Arumugam, A.Thangapandi Issac and A.Somsundaram.

(7) Discrete and Combinatorial Mathematics by Ralph P.Grimaldi.
(8) A text book of discrete mathematics by Swapan Kumar Sarkar.
(9) Mathematics for Polytechnic by S.P.Deshpande.
(10) Higher Engineering Mathematics by B.S.Grewal.
(11) Introductory Method of Numerical Analysis by S.S.Sastry.
(12) Calculus of Finite Difference and Numerical Analysis by Gupta-Malik.

Name of the course : FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING	
Course code: G207	
Teaching Scheme	**Maximum Marks : 150**
	Progressive Assessment and End Examination Scheme
Lecture : 3 hrs/week	Class test: 10 Marks,
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 10Marks Attendance: 5 Marks Sessional : 25 Marks
Practical : 2 hrs/week	End Semester Theory Exam: 75Marks
Credit : 4	End Semester Practical Exam: 25 Marks

Rationale :

For a diploma holder in Electrical, Electronics, Communication and Computer Science engineering, it becomes imperative know the fundamentals of the electrical and electronics in order to grasp the knowledge of the field. This subject will provide acquaintance with various terms, knowledge of fundamental concept of electricity, basic understanding of electronic components, their function and applications. This understanding should facilitate in operation and maintenance of equipment, which are used in various manufacturing processes in industries, power system operation, communication system, computer system etc

Course Objective :-

Module/ Unit	After completion of the course, students will be able to:
1.	Apply the fundamental concept on electrical and electronic components.
2.	Solve the simple problems on electrical and electronic circuits.
3.	Apply the appropriate techniques to solve problems using network theorems.
4	Explain the characteristic behaviors of various electronic components.
5	Explain the characteristics and applications of semiconductors, diodes and transistors.

6	Explain operation and applications of logic gates.		
Pre-Requisite :-			
1.	Class X mathematics (Algebra, simultaneous equation etc.)		
2.	Class X Physics		
3.	Class X Chemistry		
Contents (Theory)		Hrs.	Marks in %
MODULE 1			
UNIT - I	**TECHNICAL TERMS AND DEFINITIONS WITH UNITS** 1.1 Electrical Current, Electrical pressure, Potential difference , Resistance 1.2 Factors affecting Resistance and temperature coefficient of resistance 1.3 Symbolic representation of sources, loads and basic protective devices 1.4 Conductors, Insulators and Semiconductors		
UNIT - II	**D. C. CIRCUTS** 2.1 Ohm's Law 2.2 Kirchhoff's current Law 2.3 Kirchhoff's voltage law 2.4 Analysis of series and parallel resistive circuits 2.5 Node voltage and loop current analysis 2.6 Power and Energy in such circuits. 2.7 Network Theorems-The venin's theorem		

	2.8 Norton's theorem 2.9 Maximum Power transfer theorem. 2.10 Superposition theorem. 2.11 Illustrated examples in DC circuits		
UNIT-III	**FUNDAMENTALS OF A.C. CIRCUITS** 3.1 Generation of sinusoidal AC voltage 3.2 Definition of average value, R.M.S. value, form factor and peak factor of sinusoidal voltage and current 3.3 Meaning of lagging and leading of sinusoidal wave 3.4 Mathematical expression of sinusoidal voltage and current 3.5 Phasor representation of sinusoidal voltage and current 3.6 Definition of real power, reactive and apparent power 3.7 Power Triangle and power factor. 3.8 Analysis of R circuit with Phasor diagram 3.9 Analysis of R-L circuit with Phasor diagram 3.10 Analysis of R-C circuit with Phasor diagram 3.11 Analysis of R-L-C circuit with Phasor diagram 3.12 Illustrative examples involving series and parallel circuits. 3.13 Necessity and advantages of three phase systems . 3.14 Balanced supply and load in three phase systems.		
MODULE II			

UNIT-I	**1.1 SEMICONDUCTOR AND DIODES** 1.1.1 Introduction to Semiconductors, energy band theories. 1.1.2 Intrinsic and Extrinsic semiconductors 1.1.3 Potential barrier, 1.1.4 PN junction diode 1.1.5 Zener diode 1.1.6 V-I Characteristics of PN junction diode and Zener diode. 1.1.7 Introduction to LED, Varactor, Tunnel diode, Photo diode **1.2 DIODE CIRCUIT APPLICATIONS** 1.2.1 Diode as rectifying element 1.2.2 Operation of rectifiers: half and full wave rectifier. 1.2.3 Rectifier with filter circuits 1.2.4 Circuit applications of diode as clippers, clampers. 1.2.5 Zener voltage regulator circuits 1.2.6 Illustrated examples of diode circuits		
UNIT-II	**2.1 BIPOLAR JUNCTION TRANSISTOR** 2.1.1 Introduction to Transistor 2.1.2 V - I characteristics of transistor 2.1.3 Transistor in active ,saturation and cut –off region 2.1.4 Transistor as amplifier **2.2 FIELD EFFECT TRANSISTOR** 2.2.1 Introduction to FET 2.2.2 Construction of JFET		

	2.2.3 Mechanism of operation of a JFET 2.2.4 Characteristics of JFET 2.2.5 Compare JFETs and BJTs 2.2.6 Introduction to OP-AMP		
UNIT-III	**3.1 NUMBER SYSTEM AND LOGIC GATES** 3.1.1 Introduction to digital system 3.1.2 Difference between digital and analog signals 3.1.3 Number system 3.1.4 Binary, Octal, Hexadecimal 3.1.5 Binary coded decimal 3.1.6 1's and 2's complement arithmetic 3.1.7 Gray codes and excess 3 codes 3.1.8 ASCII code 3.1.9 Weighted codes 3.1.10 Logic gates- OR, AND, NOT, NOR, NAND, XOR 3.1.11 Universal logic gates 3.1.12 Illustrated examples related to Number system and logic gates. **3.2 BOOLEAN ALGEBRA** 3.2.1 Boolean variables 3.2.2 Boolean functions 3.2.3 Rules and laws of Boolean algebra 3.2.4 De Morgan's theorem 3.2.5 Algebraic reduction of Boolean expressions		

	3.2.6 Realization of Boolean expression with logic circuit 3.2.7 Karnaugh Map techniques		
	Total		

Practical:

LIST OF EXPERIMENTS:

1. To Identify of Passive circuit Components
2. To perform the good bad test of Passive Components
3. To verify Kirchhoff's Current Law and Voltage Law
4. To develop the charging and discharging curve of voltage across the capacitor connected in series with a resister
5. To measure the voltages across R, L, C and study the phasor diagram
6. To study the characteristics of series RLC circuit and to develop phasor diagram
7. To determine the forward and reverse characteristics of PN junction diode
8. To determine the input and output characteristics of Junction transistor
9. To Verify of Truth Tables for AND, OR, NOT, Exclusive-OR gates
10. To develop exclusive-OR gate using basic building block

	Skills to be developed
1.	**Intellectual skills-** Understanding working of electrical and electronics fundamentals. interpretation and analysis of electrical and electronic circuits, understanding working principles and application of semiconductors, PN junction diodes, rectifiers voltage regulators and transistors.
2.	**Motor skills-** • Draw circuit diagram, • Construct circuits to verity fundamental laws and theorems of electrical circuits,

	• Test components using appropriate instruments, • Follow standard procedure to test charging and discharging of capacitor, V-I characteristics of diodes, rectifiers, voltage regulators, Transistor as a switch and amplifier. • Troubleshooting simple electrical circuits and repairing • Design voltage regulated power supply • Troubleshooting of basic electronic circuit and repairing
3	**Social skills-** Learn to work with peers as a group Communicate with peers and teachers to clarify the doubts Arrange the workplace

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
B L Theraja	Text Book of Electrical Technology, Vol-I		S Chand
P S Dhogal and S K Mondal	Basic Electrical Engineering- Vol-I		Tata McGraw Hill
V K Mehta	Principles of Electrical and Electronics Engineering		S Chand
J B Gupta	Basic Electronics		S K Kataria and Sons
S K Mondal	Basic Electronics		Tata McGraw Hill
A P Malvino	Principles of Electronics		Tata McGraw Hill
Digital Electronics Principles and Applications	S. K. Mandal,	.	Mc Graw Hill Education.

Name of the course : DEVELOPMENT OF LIFE SKILL- II	
Subject code: G302	
Teaching Scheme	**Maximum Marks : 50**
	PA and End Examination Scheme
Theory : 1 hrs/week	Class test: 0 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 0 Marks Attendance :0 Marks Sessional: 25marks
Practical : 2 hrs/week	End Semester Theory Exam: End Semester PA Exam: 25 Marks
Credit : 2	

Rationale:

The nature of organizations is changing at very rapid speed in this competitive world. In this situation the responsibility of diploma holder is not unique. He will be a part of a team in the organization. As such the individual skills are not sufficient to work at his best.

This subject will develop the student as an effective member of the team. It will develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team.

Such skills will enhance his capabilities in the field of searching, assimilating information, managing the given task, handling people effectively, solving challenging problems .

The subject is classified under Human Science.

Course Objective :-

Module/Unit	After completion of the course, students will be able to:
1.	Apply task management techniques for given projects
2.	Enhance leadership traits
3.	Resolve conflict by appropriate method
4	Apply problem solving skills for a given situation
5	Apply techniques of effective time management
6	Face the interview without fear

7	Convince people to avoid frustration
8	Follow moral and ethics

Pre-Requisite :-

1.	Life skill-I

Contents (Theory)		Hrs	Marks in %
UNIT - I	**6.1 Inter personal Relation** Importance, Interpersonal conflicts, Resolution of conflicts, Developing effective interpersonal skills communication and conversational skills, Human Relation Skills (People Skills)	4	
UNIT- II	**2.0 Problem Solving** **I) Steps in Problem Solving (Who? What? Where? When? Why? How? How much?)** 1.Identify,understand and clarify the problem 2.Information gathering related to problem 3.Evaluate the evidence 4.Consider feasible options and their implications 5.Choose and implement the best alternative 6.Review **II)Problem Solving Technique** 1.Trial and Error,2.Brain Storming3.Thinking outside the Box	6	
UNIT - III	**3.0 Presentation Skills** Concept ,Purpose of effective presentations, **3.1 *Components of Effective Presentations***: Understanding the topic, selecting the right information, organizing the process interestingly,	14	

	Good attractive beginning, Summarising and concluding, adding impact to the ending, **3.2** ***Use of audio visual aids*** OHP, LCD projector, White board, **3.3** ***Non verbal communication***: Posture, Gestures ,Eye contact and facial expression, Voice and Language Volume, pitch, Inflection, Speed, Pause, Pronunciation, Articulation, Language Handling questions Respond, Answer, Check, Encourage, Return to presentation **3.3** ***Evaluating the presentation*** Before the presentation, During the presentation, After the presentation		
UNIT - IV	**4.0 Looking for a Job** Identifying different sources announcing Job vacancies, Skim, scan and read advertisements in detail, write efficacious CVs, write covering letters to a company CVs, write Job Application Letters in response to advertisements and self-applications	8	
UNIT - V	**5.0Job Interviews** **5.1** ***Prepare for Interviews***: Intelligently anticipating possible questions and framing appropriate answers, Do's and don'ts of an interview(both verbal and non verbal), **5.2** ***Group Discussion:*** Use of Non verbal behavior in Group Discussion, Appropriate use of language in group interaction, Do's and don'ts for a successful Group Discussion	10	

UNIT - VI	**Non verbal graphic communication** Nonverbal codes: Kinesics, Proxemics, Haptic, Vocalic, Physical appearance, Chronemics, Artifacts Aspects of Body Language	3	
	Formal Written Skills: Memos, Emails, Netiquettes, Business correspondence Letter of enquiry, Letter of Placing Orders, Letter of Complaint	3	
	Total	48 hrs	
	Sessional Activities		
Unit 1 Interpersonal Relation	Case Studies: 1.From books 2.From real life situations 3.From students' experiences Group discussions on the above and step by step write of any one or more of these in the sessional copies		
Unit II Problem Solving	Case Studies: 1.From books 2.From real life situations 3.From students' experiences Group discussions on the above and step by step write of any one or more of these in the sessional copies		
Unit III Presentation Skills	Prepare a Presentation (with the help of a Power point) on a Particular topic. The students may refer to the Sessional activity (sl.No.8) of the Computer Fundamental syllabus of Semester1. For engineering subject oriented technical topics the cooperation of a subject teacher may be sought. Attach hand out of PPT in the sessional copy		
Unit IV Looking for a job	Write an effective CV and covering letter for it. Write a Job Application letter in response to an advertisement and a Self-Application Letter for a job.		

Unit V Job Interviews &Group Discussions	Write down the anticipated possible questions for personal interview (HR)along with their appropriate responses Face mock interviews. The cooperation of HR personnel of industries may be sought if possible Videos of Mock Group Discussions and Interviews may be shown		
Unit VI Formal Written Skills	Write a memo, Write an effective official e-mail, write a letter of enquiry, letter of placing orders, letter of complaint		

SL. NO.	**Skills to be developed**
1	**Intellectual skills-** **1.** Understand the problem
2	**Motor skills-** **1.** Apply task management techniques for given projects **2.** Apply techniques of effective time management.
3	**Social skills-** 1. Convince people to avoid frustration 2. Follow moral and ethics

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Marshall Cooks	Adams Time management		Viva Books
E.H. Mc Grath , S.J.	Basic Managerial Skills for All		Pretice Hall of India, Pvt Ltd
Allen Pease	Body Language		Sudha Publications Pvt. Ltd

Lowe and Phi	Creativity and problem solving		Kogan Page (I) P Ltd
Adair, J	Decision making & Problem Solving		Orient Longman

Name of the course : PROFESSIONAL PRACTICES- II	
Course code: CE513	**Semester : THIRD**
Teaching Scheme	**Maximum Marks : 50**
	PA and End Examination Scheme
Theory : 0 hrs/week	Class test: 0 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 0 Marks Attendance : 0 Marks Sessional : 50
Practical : 2 hrs/week	End Semester Theory Exam: 0 Marks
Credit : 1	Practical Exam: 0 Marks

Rationale / Aim :-

Interaction with industry is essential for proper understanding regarding implementation procedure of the theoretical knowledge gained during course of study. The course contents of professional practice-II are designed to develop interpersonal skill and adoptability to the industry so that the student will be benefited in their professional carrier.

Course Objective :-

Module/Unit	After completion of the course, students will be able to:
1.	Interact with peers to share thoughts.
2.	Implement conceptual idea into practise
3.	Prepare technical notes.
4.	Ilustrate and present the techincal ideas gained.
5.	Prepare a report on industrial visit, expert lecture.
6.	Update oneself regularly with latest technological developments in this field as the knowledge in this field is expanding in leaps and bounds

Pre-Requisite :-

1	

Contents		Hrs.	Marks in %
UNIT - I	1.0 Industrial Visits	6	10

	Structured industrial visits be arranged and report of the same should be submitted by theindividual student, to form a part of the term work. Industrial visits may be arranged in the following areas / industries: •Building construction site		
UNIT-II	2.0 Lectures by Professional / Industrial Expert be organized from ANY ONE of the following areas: • Batching plant • Different types of construction machineries and equipment	10	10
UNIT - III	3.0 Individual Assignments: Any two from the list suggested OR Conduct ANY ONE of the following activities through active participation of students and write report • Preparation of drawing of an existing structure • Plot measurement • Study of building rules – in panchayat, municipality and corporation areas • Study of different fitting and fixtures and components of different types of shuttering	18	30
	Total	38 hrs	50

Practical :-

S.No	**Skills to be developed**
1.	**Intellectual skills-** 1. Interact with industry people- executive and working level 2. Implementation of theoretical concept. 3. Exchange of ideas. 4. Adopting safety precautions.
2.	**Motor skills-** 1. Development of supervisory skill.

3	**Social skills-** 1. Development of ethics. 2. Will learn to work with peer as group. 3. Able to communicate with teachers and peers to clarify doubts**.**

TERM -IV

ENGINEERING ECONOMICS AND ACCOUNTANCY

L	T	P	**Curri. Ref. No.: G303**
3	0	0	

Total Contact hrs.:
Theory: 45
Tutorial: 0
Practical: 0
Credit: 3

Total marks: 100

Theory:
End Term Exam: 75
P.A.: 25

RATIONALE

The knowledge of Engineering Economics and Accountancy is needed by personnel dealing with the cost of products of any kind related to quality and standards of production including its financial control. Engineers / Technicians, in general, need to know the cost of the final products for marketing purposes. The knowledge of Economics as well as Accountancy is required by all people dealing in any business or enterprise.

This particular subjects deals in basic concepts of economics, production of commodities, different types of industries, market forms, objective of economic planning, concept of value of money, causes of unemployment, industrial policy, business transaction and accountancy, maintenance of cash and balances, receipt and expenditures and final accounts.

DETAIL COURSE CONTENT

THEORY:

UNIT	TOPIC / SUB-TOPIC	Lecture Hrs.
1.0	**INTRODUCTION**	**1**
1.1	Introduction to Economics and its Utility of study	
1.2	Importance of the study of Economics	
2.0	**BASIC CONCEPTS OF ECONOMICS**	**3**
2.1	Definition of Utility, Consumption, Want, Value, Price, Goods, National Income.	
2.2	Classification of goods, characteristics and	

classification of wealth.

2.3 Basic Laws of demand and supply.

2.4 Concept and Measurement of Elasticity of demand

3.0 PRODUCTION **3**

3.1 Meaning and factors of production.

3.2 Land, Labour, Capital and Organisation

3.3 Formation of Capital, Break even chart-its uses.

4.0 SCALE OF INDUSTRIES **2**

4.1 Definition, advantages and disadvantages of small, medium and large scale production

4.2 Internal and External Economies

5.0 MARKET FORMS **3**

5.1 Definition and types of Markets in respect of present trends.

5.2 Features of Perfect, Imperfect and monopoly markets.

5.3 Price determination under perfect competition and monopoly

6.0 ECONOMIC PLANNING **3**

6.1 Features of Under-developed and Developing Countries.

6.2 Meaning, objectives and needs of planning.

6.3 Introduction to industrial development in India during the five year plans.

7.0	**MONEY**	**3**
	7.1 Meaning and functions of Money	
	7.2 Introduction to the concept of the value of money	
	7.3 Meaning of Inflation, Deflation, Stagnation.	
8.0	**UNEMPLOYMENT**	**2**
	8.1 Meaning, types and causes of Unemployment	
	8.2 Unemployment problems in India	
9.0	**INDUSTRIAL POLICY**	**3**
	9.1 Current Industrial Policy	
	9.2 Industrial licensing Policy, De-licensing	
	9.3 Monopolistic and Restricted Trade practices (MRTP) Foreign Exchange Regulation Act (FERA).	
10. 0	**BUSINESS TRANSACTIONS AND ACCOUNTANCY**	**5**
	10.1 Transactions and classifications, need and objectives of proper records including double entry system.	
	10.2 Classification of Accounts and its description (in respect of real accounts, personal accounts and nominal accounts)	
	10.3 Debit and credit concept; golden rules of debit and credit.	
	10.4 Objectives and principles of double entry book-keeping.	

11.0	**BOOKS OF ACCOUNTS**	**2**
	11.1 Journal and Ledger, their sub-divisions; posting from journals to ledger.	
	11.2 Balancing of Accounts	
12.0	**CASH BOOK**	**2**
	12.1 Objective of Cash Book (in respect of all kinds of Cash transactions)	
	12.2 Single column, double column and triple column cash book	
	12.3 Imprest system of Petty Cash Book.	
13.0	**TRIAL BALANCE**	**2**
	13.1 Objective, Preparation, errors and rectification (in respect of balance of accounts for the total period).	
14.0	**FINAL ACCOUNTS**	**5**
	14.1 Steps of preparing accounts; Trading Account; Profit and Loss Account	
	14.2 Revenue and Depreciation adjustment	
	14.2 Introduction to balance sheet	
15.0	**CAPITAL AND REVENUE EXPENDITURE DISTRIBUTION**	**3**

15.1 Receipts and payments

15.2 Income and Expenditure differences

16.0 MEANING AND PURPOSE OF COSTING 2

16.1 Elements of Cost-Analysis and classification of expenditure for cost accounts.

16.2 Cost Control – Prime cost, Overhead cost, and Indirect materials and tools.

17.0 ELECTRONICS COMMERCE – MEANING – SCOPE 1

17.1 Accounting Software – Tally latest version

SUGGESTED LEARNING RESOURCES:

Reference Books :

1. Agrawal, A.N., Indian Economy, New Delhi ; wish Prahashan, 2005

2. Wali, B.M., and A.B. Kalkundrikar – Managerial Economics, New Delhi : R.Chand and Co., 1983

ENTREPRENEURSHIP DEVELOPMENT

L	T	P	Curri. Ref. No.: G304
3	0	0	

Total Contact hrs.: **Total marks: 100** **Theory:**
Theory: 45 End Term Exam: 75
Tutorial :0 P.A.: 25
Practical: 0
Credit: 3

RATIONALE

The course intends to provide the fundamental aspects of entrepreneurship as a means for self employment and culminating in economic development of the country. It deals with basic issues like entrepreneurial characteristics and quality, governmental policy support and overall scenario along with opportunities and the facilities available for entrepreneurship development.

DETAIL COURSE CONTENT

THEORY:

UNIT	TOPIC / SUB-TOPIC	Lecture Hrs.
1.0	**INTRODUCTION**	**10**
1.1	Definition and functions of Entrepreneur, entrepreneurship quality, entrepreneurial spirit, need for entrepreneurship.	
1.2	Individual and social aspects of business – achievement motivation theory	
1.3	Social responsibilities of Entrepreneurs	
2.0	**FORMS OF BUSINESS ORGANISATION**	**4**
2.1	Types of company	
2.2	Merits and demerits of different types	
2.2	Registration of small scale industries	
2.4	Conglomeration.	
3.0	**SMALL SCALE AND ANCILLARY INDUSTRIES**	**8**

3.1 Definition – scope with special reference to self employment.
3.2 Procedure to start small scale and Ancillary industries
3.3 Pattern on which the Scheme/Project may be prepared
3.4 Sources of finance - Bank, govt., and other financial institutions.
3.5 Selection of site for factory
3.6 Factors of selection
3.7 N.O.C. from different authorities, e.g., Pollution Control Board, Factories Directorate etc.
3.8 Trade License.

4.0 SYSTEM OF DISTRIBUTION 1

4.1 Wholesale Trade
4.2 Retail trade

5.0 SALES ORGANISATION 3

5.1 Market survey, marketing trends, knowledge of competitors, product selection & its basis .
5.2 Sales promotion
5.3 Advertisement
5.4 Public relations and selling skills

6.0 PRICING THE PRODUCT 1

6.1 Basic guidelines

7.0 INTRODUCTION TO IMPORT AND EXPORT 6

7.1 Procedures for export
7.2 Procedures for import
7.3 Technical collaboration – international trade
7.4 Business insurance
7.5 Rail and road transport
7.6 Forwarding formalities, FOR, FOB, CIF, etc.

8.0 BUSINESS ENQUIRIES 4

8.1 Enquiries: From SISI, DIC, SFC Dept. of Industrial Development Banks.

8.2 Offers and Quotations
8.3 Orders

9.0 PROJECT REPORT **6**

9.1 Project Report on feasibility studies for small scale industries, proposal for finances from bank and other financial institutions for establishing new industries and its extension, obtaining License enlistment as suppliers, different vetting organizations for Techno Economic feasibility report.
Breakeven analysis, Breakeven point.

10.0 ENVIRONMENT LEGISLATION **2**

10.1 Air Pollution Act
10.2 Water Pollution Act
10.3 Smoke Nuisance Control Act
10.4 ISO: 14000, OSHA

SUGGESTED LEARNING RESOURCES:

Reference Books:

1. Entrepreneurship Development
   Prepared by CTSC Manila Publishers by Tata Mc Graw Hill Publishing Co. Ltd.
2. Small Enterprise Management Published by ISTE, Mysore
3. Motivation Published by ISTE, Mysore
4. S.S.M. in Environmental Engineering Published by ISTE, Mysore
5. Entrepreneurship New Venture Creations, Holt, Prentice Hall, India.
6. Essence of TQM by John Bank

7. Rathore, B.S. and J.S. Saini(ed), A Handbook of Entrepreneurship – Panchkula : Aapga, 1997
8. Jose Pauletal, Entrepreneurship Development, Mumbai : Himalaya Publishing House, 1996
9. Khanka, S.S., Entrepreneurship Development, New Delhi : S. Chand and Co., 2001
10. Nagarazan, R.S. and A.A. Arivalagar, TQM New Delhi : New Age International Publishers, 2005
11. Bhatia, R.C., Marketing Communication and Advertising, New Delhi : Galgotia Publishing Co., 2003
12 Sinha, J.C., and V.N. Mugali : A Textbook of Commerce, New Delhi : R. Chand and Co., 1994

PRINCIPLES OF MANAGEMENT

L	T	P		
3	0	0		**Curri. Ref. No. G305**
Total Contact hrs.:			**Total marks: 100**	**Theory:**
Theory: 45				End Term Exam: 75
Tutorial :0				P.A.: 25
Practical : 0				
Credit: 3				

RATIONALE

Management is the integrated component of all areas of technological courses as recognized across the world. Technicians or supervisors coming out of the system hence need to study the basics components of the management relevant to them. Principals of management will enable them to apply basic knowledge of management in their field of work. Keeping with this in mind necessary content details of the course on Principles of Management has been developed. With the assumption that, it will develop some management foundation to the diploma students.

DETAIL COURSE CONTENT

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
FRAMEWORK OF MANAGEMENT	**8**
1.1 Nature of management	
1.2 Development of management thoughts	
1.3 Management and process skills	
2.0 PLANNING	**9**
2.1 Fundamentals of planning	
2.2 Planning premises and forecasting	

2.3 Decision making

2.4 Mission and objective

3.0 ORGANIZING **10**

3.1 Fundamentals of organizing

3.2 Design of organization structure

3.3 Forms of organization structure

3.4 Power and authority

3.5 Authority relationship

4.0 STAFFING **8**

4.1 Fundamentals of staffing

4.2 HR planning

4.3 Recruitment and selection

4.4 Training and development

4.5 Performance appraisal

5.0 DIRECTING **6**

5.1 Fundamentals of directing

5.2 Operational control techniques

5.3 Overall control technique

6.0 TOTAL QUALITY MANAGEMENT 4

6.1 Concepts and definitions

6.2 Sages of quality gurus and their contributions

6.3 Basic tools of TQM

SUGGESTED LEARNING RESOURCES:

Reference books:

1. Principles of management, by: T.Ramasamy (Himalya publishing house)
2. Management by: S. P. Robins
3. Management principles by: Anil Bhat and Arya Kumar
4. Principles and practice of management by LM Prasad
5. Principles of management by LM Prasad
6. Essentials of Management / Joseph L. Massie / Prentice-Hall of India

ORGANIZATIONAL BEHAVIOUR

L	T	P	Curri. Ref. No.:G306
3	0	0	

Total Contact hrs.:
Theory: 45
Tutorial :0
Practical: 0
Credit: 3

Total marks: 100

Theory:
End Term Exam: 75
P.A.: 25

RATIONALE

Knowledge in behavioural principles in an organization is an important requirement because concepts such as work motivation, behavioural patterns of individuals as also those of group of individuals etc are intimately related to it. Organizational Behavioural principles, its scopes, applicability etc. are therefore important to know by the students irrespective of the branch of specialization. Based of the above facts following content details of the subject on Organizational Behaviour has been suggested.

DETAIL COURSE CONTENT

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
1.0 ORGANIZATION:	**8**
Concept and Definition	
Structures (line, staff, functional divisional, matrix)	
2.0 MOTIVATION :	**10**
Principles of Motivation	
Aspects of Motivation	

Job motivation

Theories of motivation (Maslow, Herzberg, Theory of X&Y of Mc. Gregar)

3.0 DEVELOPING GOOD WORK HABITS: 10

Principles of habit formation

Attitude and values

Personality-

- Concepts

- Theories

- Personality and Behaviour

4.0 ORGANIZATIONAL CULTURE: 8

Concepts and its importance

Determinants of organizational culture

Rules & regulations

5.0 TEAM BUILDING: 9

Concepts
Team and Group

Formation of Team building

SUGGESTED LEARNING RESOURCES:

Reference Books:

1. Organisational Behaviour — An introductory Text – Huezynski A. & Bucheman C. (Prentice Hall of India)

2. Image of Organisation — Morgan G. (Sage)
3. Understanding Management — Linstoand S. (Sage)
4. Organizational Behaviour — Robbins (Prentice Hall of India)
5. Understanding and Managing – Organizational Behavior — George & Jones
6. Organisational Behaviour, L.M. PRASAD, New Delhi, Sultan Chand & Sons
7. Essentials of Management — Koontz (Tata McGraw Hill)

ENVIRONMENTAL EDUCATION

L	T	P		
3	0	0		**Curri. Ref. No. G307**
Total Contact hrs.:			**Total marks: 100**	**Theory:**
Theory: 45				End Term Exam: 75
Tutorial : 0				P.A.: 25
Practical : 0				
Credit: 3				

RATIONALE

Management of Environmental Degradation as also its control using innovative technologies is of prime importance in the times we are living in. Since the days of the famed Rio Summit (1992) awareness about degradation of environment we live in an its management through participation of one and all has literally blossomed into a full fledged movement of universal importance. Technically qualified people, such as the Diploma Engineers, should not only be aware about new technologies to combat environmental degradation at their disposal but also various aspects of environment, ecology, bio-diversity, management, and legislation so that they can perform their jobs with a wider perspective and informed citizens. This course can be taken by all diploma students irrespective of their specializations.

DETAILED COURSE CONTENT

THEORY:

UNIT	TOPIC / SUB-TOPIC	Lecture Hrs.
1.0	**INTRODUCTION**	**2**
	1.1 Introduction 1.2 Environment and its components 1.3 Environment in India 1.4 Public Awareness	
2.0	**ECOLOGICAL ASPECTS OF ENVIRONMENT**	**8**
	2.1 Ecology • Eco-system • Factors affecting Eco-system	

2.2 Bio-geochemical cycles
- Hydrological cycle
- Carbon cycle
- Oxygen cycle
- Nitrogen cycle
- Phosphorous cycle
- Sulphur cycle

2.3 Bio-diversity
2.4 Bio-diversity Index

3.0 NATURAL RESOURCES 5

3.1 Definition of Natural Resources
3.2 Types of Natural Resources
3.3 Quality of life
3.4 Population & Environment
3.5 Water Resources
- Sources of Water

3.6 Water Demand
3.7 Forest as Natural Resource
- Forest and Environment
- Deforestation
- Afforestation
- Forest Conservation, its methods

3.8 Land
- Uses and abuses of waste and wet land

4.0 GLOBAL ENVIRONMENTAL ISSUES 9

4.1 Introduction
4.2 Major Global Environmental Problems
4.3 Acid Rain
- Effects of Acid Rain

4.4 Depletion of Ozone Layer
- Effects of Ozone Layer Depletion

4.5 Measures against Global Warming
4.6 Green House Effect

5.0 ENVIRONMENTAL POLLUTION 9

5.1 Introduction
5.2 Water Pollution
- Characteristics of domestic waste water
- Principles of water treatment
- Water treatment plant (for few industries only- unit operations & unit processes - names only)

5.3 Air Pollution
- Types of air pollutants
- Sources of Air Pollution
- Effects of Air Pollutants

5.4 Noise Pollution
- Places of noise pollution
- Effect of noise pollution

6.0 CLEAN TECHNOLOGY 6

6.1 Introduction to Clean Technologies
6.2 Types of Energy Sources
- Conventional Energy sources
- Non-conventional sources of Energy

6.3 Types of Pesticides
6.4 Integrated Pest Management

7.0 ENVIRONMENTAL LEGISLATION 3

7.1 Introduction to Environmental Legislation
7.2 Introduction to Environmental Laws

8.0 ENVIRONMENTAL IMPACT ASSESSMENT 3

8.1 Introduction to Environmental Impact Assessment
8.2 Environmental Management (elements of ISO 14001)
8.3 Environmental ethics

SUGGESTED IMPLEMENTATION STRATEGIES:

The teachers are expected to teach the students as per the prescribed subject content. This subject does not have any practical but will have only demonstration and field visit as stated. The students will have to prepare report of the site visit.

SUGGESTED LEARNING RESOURCES:

(a) Reference Books:

S. No.	Title	Author, Publisher, Edition & Year
1.	Environmental Engineering	Pandya & Carny, Tata McGraw Hill, New Delhi
2.	Introduction to Environmental Engineering and Science	Gilbert M. Masters Tata McGraw Hill, New Delhi
3.	Waste Water Engineering – Treatment, Disposal & Reuse	Metcalf & Eddy Tata McGraw Hill, New Delhi
4.	Environmental Engineering	Peavy, TMH International New York
5.	Study / training materials, references, reports etc. developed by Central Pollution Control Board, New Delhi as also State Pollution Control Boards	Central Pollution Control Board Postal Address: Parivesh Bhawan, CBD-cum-Office Complex East Arjun Nagar, DELHI - 110 032, INDIA Tel.: 91-11-22307233 Fax: 91-11-22304948 e-mail: ccb.cpcb@nic.in
6.	Environmental Science	Aluwalia & Malhotra, Ane Books Pvt. Ltd, New Delhi
7.	Text Book of Environment & Ecology	Sing, Sing & Malaviya, Acme Learning, New Delhi
8.	Environmental Science & Ethics	Sing, Malaviya &Sing , Acme Learning, New Delhi
9.	Environmental Chemistry	Samir K. Banerji, Prentice Hall of India, New Delhi

(b) Others:

1. Text book mentioned in the references
2. Lab Manuals
3. OHP Transparencies
4. Video film on Environment

SUGGESTED LIST OF DEMONSTRATIONS/FIELD VISIT

- pH value of water sample.
- Hardness of water
- Calcium hardness
- Total Hardness
- Residual Chlorine to a given sample of water
- Turbidity
- B.O.D.
- C.O.D.

Visits: Following visits shall be arranged by the teachers during the semester:

- Water Treatment Plant
- Sewage Treatment Plant
- Maintenance work of water supply mains and sewage system

Name of the course : CIVIL ENGINEERING DRAWING -II			
Course code: CE403		**Semester : Fourth**	
Teaching Scheme		**Maximum Marks : 100**	
		PA and End Examination Scheme	
Theory : 1 hrs/week		Class test: 0 Marks	
Tutorial: 0 hrs/week		Assignment / Quiz etc.: 0 Marks Attendance : 0 Marks	
Practical : 3 hrs/week		End Semester : 50Marks	
Credit : 3		PA Practical : 50 Marks	
Rationale:			
This subject deals with drawing to be made for different components of sanitary engineering, bridges & culverts, roads & railways and blue prints to be made of the drawings. This also relates to preparation of working drawing as required for actual drawing			
Course Objective :-			
Module/Unit	After completion of the course, students will be able to :		
1.	draw sanitary & water supply system		
2.	draw plan and elevation of bridges & culverts		
3.	draw plan of roads & railways		
4	draw complete plan, elevation & sections of RCC building		
Pre-Requisite :-			
	CE 402		
Contents (Theory)		Hrs	Marks in %
UNIT - I	1.0 SANITARY ENGINEERING 1.1Plan, Sectional elevation of sanitary latrine with septic tanks, inspection chambers, manholes, soak pits, showing soil pipe connection	12	10

UNIT- II	2.0 BRIDGE AND CULVERTS 2.1 Plan, elevation, section of simple (i) timber bridge (ii)RCC bridge (iii) Steel bridge (truss) as constructed by the local PWD. Drawings may be shown. 2.2 Plan, elevation, section of a box culvert and hume pipe, culvert, RCC slab culvert, Drawing and Models may be shown .	8	15
UNIT - III	**3.0** ROADS AND RAILWAYS 3.1 Cross Section of (i)National highway/ state highway (ii)Major district road (iii)Minor district road 3.2 Cross-section of Railway for B.G., M.G. and N.G.	12	10
UNIT - IV	4.0 DRAWING OF A SINGLE & TWO STORIED DUILDING 4.1Given situations and plot area, prepare detailed drawing of a single storied residential building i.e. line plan, detailed plan, elevation and section of the building. 4.2 Given situations and plot area, prepare detailed drawing of a two storied residential building i.e. line plan, detailed ground floor plan, first floor plan, second floor plan, design of stair case, elevation of sections. Other plans and tables required to be submitted for approval	22	10
UNIT V	5.0 PERSPECTIVE DRAWING 5.1 Related terms 5.2 Procedure of preparing perspective view One point method, two point method	6	5
	Total	60 hrs	50
Practical :-			
S.No	**Skills to be developed**		

1.	**Intellectual skills-** 4. To develop the idea about different civil engineering structural elements.
2.	**Motor skills-** 3. To draw Complete plan, elevation & sections different civil engineering structures
3	**Social skills-** 1. To work with peer as group **2.** To communicate with teachers and peers to clarify doubts.

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
N.D. Bhatt	Elementary Engineering Drawing -		Charotar Publishing House
G.R. Nagpal	Geometrical Drawing -		Khanna Publishers
Prof. C. H. Khadilkar	A Text book Of Bridge Construction by -		Allied Publishers, Bombay, New Delhi and Calcutta.
Warren J. Luzadder	Graphics for Engineers -		Prentice Hall of India (Pvt.) Ltd.

Name of the course : SURVEYING II	
Subject code: CE503	**Semester : FOURTH**
Teaching Scheme	**Maximum Marks : 125**
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 10 Marks Attendance : 5 Marks
Practical : 3 hrs/week	End Semester Theory Exam: 75 Marks End Semester Practical Exam: 25 Marks
Credit : 5	

Rationale:

Surveying- II is the sequential course following Surveying-I. The course covers the technique of preparing survey map by plotting the observed data on the map at the field itself, using the method of Plane Table Surveying. It also covers the technique of handling and use of theodolite, a versatile instrument, in surveying for horizontal and vertical angular measurement, traversing, horizontal linear measurement, setting out curves and layout of different types of structures in the site. The course also gives an exposure to the students about the modern surveying instruments. The theory course is supplemented with practical course in Surveying Practice-II.

Course Objective :-

Module/Unit	After completion of the course, will be able to:
1.	Conduct plane table survey by various methods
2.	Draw contour map of an area after conducting survey
3.	Explain the principle of theodolite survey with necessary adjustment of the theodolite
4	Conduct traversing by theodolite with adjustment of error (open and closed traverse)
5	Explain the principle of tachometry and conduct tachometric survey
6	Set out simple and transition curves

7	Demonstrate various features of a Total station and carry out traversing by using total station
Pre-Requisite :-	
1.	Concept of engineering mechanics and surveying I

Contents (Theory)		Hrs	Marks
UNIT - I	**PLANE TABLE SURVEYING** 1.1 Objectives of plane table surveying, comparison with chain & compass surveying, use of plane table surveying 1.2 Principles of plane table surveying 1.3 Instruments & accessories in plane table surveying- features and uses 1.4 Setting up plane table-centering, leveling, orientation 1.5 Methods of plane table surveying- (1) Radiation (2) Intersection, (3) Traversing (4) Resection. 1.6 Statements of two point and three point problem and their applications 1.7 Errors in plane table surveying and their corrections, precautions in plane table surveying.	6	6
UNIT - II	**PRINCIPLES OF THEODOLITE SURVEYING** 2.1 Purpose, definition of terms 2.2 Description of features, component parts of a transit theodolite 2.3 Fundamental axes of a theodolite, concept of vernier, reading a vernier 2.4 Temporary adjustments of theodolite 2.5 Concept of transiting-swinging, face left , face right, changing face 2.6 Measurement of horizontal angles with theodolite by repetition and reiteration method 2.7 Measurement of vertical angles with theodolite 2.8 Determination of magnetic bearings with theodolite 2.9 Measurement of deflection angle, direct angle, setting out angles, prolonging a straight line with theodolite	4	9

	2.10 Errors in theodolite observations		
UNIT - III	**THEODOLITE TRAVERSING** 3.1 Methods of traversing with theodolite- included angle method, deflection angle method, bearing method 3.2 Plotting the traverse by coordinate method 3.3 Checks for open and closed traverse 3.4 Traverse Computation - consecutive coordinates, latitude and departure, Gale's traverse table, Numerical problems on omitted measurements of lengths & bearings 3.5 Closing error- adjustment of angular errors, adjustment of bearings, numerical problems 3.6 Balancing of traverse- bowditch's method, transit method, graphical method, axis method 3.7 Calculation of area of closed traverse	6	12
UNIT - IV	**TRIGNOMETRICAL SURVEYING &: TACHEOMETRY** 4.1 Determination of elevation and distances of objects whose base is accessible, numerical problems 4.2 Determination of elevation and distances of objects whose base is inaccessible and the object and the instrument station (i)are in the same plane, (ii) are not in the same plane numerical problems 4.3 Principles of stadia tacheometry, stadia constants determination 4.4 Elevations and distances of staff stations-numerical problems	8	12
UNIT - V	**CURVES** 5.1 Definitions, degree and radius of curve, types of curves - simple, compound, reverse and transition curve, Purpose & use of different types of curves in field 5.2 Elements of circular curves, numerical problems 5.3 Preparation of curve table for setting out 5.4 Setting out of circular curve by chain and tape and by instrumental angular methods (i) offsets from long chord; (ii)successive bisection of arc (iii)offsets from	8	12

	tangents (iv) offsets from chords produced (v) Rankine's method of tangential angles 5.5 Transition curves -description and their characteristics (numerical problems not required)		
UNIT - VI	**SETTING OUT WORKS** 6.1 Methods of setting out layouts of structures from construction plans of (i) buildings, (ii) culverts, (iii) bridge piers	4	4
UNIT - VII	**MINOR SURVEYING INSTRUMENTS** 7.1 Essential features and use of - (i)Hand Level, (ii) Abney's Level, (iii) Pantograph, (iv) Ceylone Ghat Tracer, (v) Box Sextant	2	4
UNIT - VIII	**MODERN SURVEYING METHODS** 8.1 Features and use of Total station 8.2 Working principles of a Total Station 8.3 Setting out traverses with Total Station, Determination of elevations of points, building heights 8.4 Introduction to GPS	10	16
	Total	48 hrs	75

SURVEYING Practical			
Rationale:			
Surveying being a practice oriented subject, the theoretical instruction has to be supplemented with practical instructions in the field. This course will give the students the opportunity for intensive hands-on -experience in the handling and use of various equipment and accessories used in surveying. The course will also lead to development of skills in the students of making appropriate recording of data in the field and of plotting the observed data. The course content of surveying-II practical includes the handling and use of theodolite in traversing, trignometrical surveying, application of tacheometry, setting out of curves and civil engineering works at the site. The course also gives an exposure to modern surveying techniques including the instruments used.			
UNIT - I	**PLANE TABLE SURVEYING**		

	1.1 Setting up of Plane Table and plotting five points by radiation method and five inaccessible points by intersection method 1.2 Conducting Plane Table surveying in a given plot of area by traversing (at least a 5-sided traverse and locating the objects	4	
UNIT - II	**CONTOURING** 2.1 Locating contour points in the given area by direct method/ indirect method 2.2 Conducting block level survey in the given area 2.3 Plotting and drawing contour lines of the block level survey in Exercise 2.2 2.4 Preparing the contour map of a given area by radial method	4	
UNIT - III	**THEODOLITE** 3.1 Study of essential features and parts of transit theodolite, to describe the theodolite with neat sketches 3.2 Carry out temporary adjustment of a transit theodolite and read horizontal and vertical angles to objects 3.3 Measurement of horizontal angles (3nos.) by repetition and reiteration method and compare two methods 3.4 Prolonging a given straight line with the help of a Theodolite 3.5 Determination of magnetic bearing of 3 given straight lines	6	
UNIT - IV	**THEODOLITE TRAVERSING** 4.1 Setting out a closed traverse with 6 sides and entering the field data 4.2 Plotting the traverse from exercise 4.1 and checking the error of closure 4.3 Setting out an open traverse with 5 sides and entering the field data 4.4 Plotting the traverse from exercise 4.3 and checking the error of closure	8	
UNIT - V	**TRIGNOMETRICAL SURVEYING & TACHEOMETRY** 5.1 Determination of height of 3 objects whose bases are accessible 5.2 Determination of stadia constants 5.3 Determination of horizontal distance and elevation with Staff vertical , by stadia method	6	

UNIT - VI	**SETTING OUT CURVES** 6.1 Setting out a simple circular curve by offsets from long Chord 6.2 Setting out a simple circular curve by Rankine's method of tangential angle (Deflection angles)	4	
UNIT - VII	**SITE SURVEYING** 7.1 Setting out at site the center line and foundation width of a building from the given plan 7.2 Setting out the foundation line for a culvert 7.3 Dividing an area into plots of given size	4	
UNIT - VIII	**MODERN SURVEYING INSTRUMENTS** 8.1 Total Station with EDM and GPS 8.2 Measure distance between two points with electronic distance meter 8.3 Measure distance, elevation, horizontal and vertical angle of an object with modern theodolite 8.4 Typical site layout by using Total Station.	12	
	Total	48	25
S.no.	Skills to be developed		
1	**Intellectual skills-** 1. To identify and use of equipment in correct manner. 2. To observe and take the reading accurately while positioning of instrument. 3. To follow safety instructions properly. 4. To plot the maps accurately with the help of field data.		
2	**Motor skills-** 1. To operate instruments properly. 2. To use proper marking tools.		
3	**Social skills-** 1. To work with peer as group. 2. To communicate with teachers and peers to clarify doubts.		

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
T.P.Kanetkar & S.V.Kulkarni	Surveying & Levelling Vol.I ,II		Griha Prakash, Pune

B.C.Punmia	Surveying Vol.I, II, III		Laxmi Publications, Delhi-6
R.agor	A text book of surveying and levelling		Khanna Publishers, Delhi-6
Hussain and Nagraj	Surveying and Levelling		S.Chand & Co, Delhi
S.C.Rangawala	Surveying & Levelling		Charotar Book Stall, Pune
N.N.Basak	Surveying & Levelling		Tata Mcgrew Hill
A.De	Plane Surveying		S.Chand & Co

Name of the course : **HYDRAULICS**	
Course code: CE407	**Semester : Fourth**
Teaching Scheme	**Maximum Marks : 150**
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks
Tutorial: 1 hrs/week	Assignment / Quiz etc.: 10 Marks Attendance : 5 Marks
Practical : 2 hrs/week	End Semester Theory Exam:75 Marks
Credit : 5	PRCTICAL END EXAM: 25, PA: 25 Marks

Rationale:

The subject of Hydraulics deals with behavior of fluid at rest and in motion. The Civil Engineering profession is much concerned with subjects like Water supply, Sanitary Engineering and Irrigation Engineering, which need a sound knowledge of Hydraulics. Therefore, hydraulics is a very important basic subject for students of civil engineering.

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Course Objective :-

Module/Unit	After completion of the course, students will be able to:
1.	Explain fundamentals of fluid mechanics and define different term
2	Apply the basic equation of fluid statics to determine forces on plain and curved surfaces submerged in a static fluid; for determination of buoyancy and stability
3	Develop an understanding of fluid mechanics in civil engineering as well as a variety of other practical fields.
4	Understand the kinematics of fluid particles, including the concepts of substantive derivatives
5	Apply the Bernoulli equation to solve real problems in fluid mechanics
6	Determine flow rates, pressure changes, minor and major head losses for viscous flows through pipes, ducts, simple networks
7	Apply principles of fluid mechanics to the operation, design, and selection of fluid machinery such as pumps

Pre-Requisite :-

	Basic concepts of engineering mechanics, engineering mathematics

Contents (Theory)		Hrs	Marks
UNIT - I	**1.0 HYDROSTATICS** 1.1 Properties of fluids, density, specific gravity, surface tension, capillarity, viscosity and their uses 1.2 Pressure and its measurements : Definitions- intensity of pressure, atmospheric pressure, gauge pressure, absolute pressure and vacuum pressure; Relation between atmospheric pressure, absolute pressure and gauge pressure, pressure head, pressure gauges 1.3 Pressure exerted on an immersed surface; Definitions- total pressure, resultant pressure, expression of equation for total pressure exerted on horizontal, vertical and inclined immersed surface (No deduction); Center of pressure and its expression. 1.4 Floatation and buoyancy: Archimedes principle- buoyancy & center of buoyancy, center of pressure, metacenter, metacentric height, determination of metacentric height by experimental method, equilibrium of floating bodies- stable, unstable & neutral equilibrium	14	16
UNIT- II	**2.0 KINEMATICS OF FLUID FLOW** 2.1 Basic equations of fluid flow and their application (No deduction): rate of discharge, equation of continuity of a liquid flow, total energy of a liquid in motion- potential, kinetic & pressure, Bernoulli's theorem and its limitations. Practical applications of Bernoulli's equation.	6	10
UNIT III	**3.0 FLOW THROUGH ORIFICES & MOUTH PIECES** 3.1 Flow through Orifices: Orifices, types of orifices, venacontracta, hydraulic coefficients and their relations, determination of hydraulic coefficients, discharge formulae for different types of orifices and their application (No deduction) 3.2 Flow through mouthpieces: mouthpieces, types of mouthpieces, discharge formulae for different types of mouthpieces and their application (No deduction)	10	12

UNIT - IV	**4.0 FLOW OVER WEIRS & NOTCHES** 4.1 Flow over Notches: notch, types of notches, discharge formulae for different types of notches and their application (No deduction) 4.2 Flow over Weirs: weir and its difference with notches, types of weirs, discharge formulae for different types of weirs and their application (No deduction)	10	14
UNIT V	**5.0 FLOW THROUGH PIPES** 5.1 Types of Flow through pipes: uniform & non-uniform; laminar & turbulent; steady & unsteady; Reynold's number and its implication. 5.2 Losses of head of a liquid flowing through pipes: due to friction (statement of Darcy's equation), sudden enlargement, sudden contraction, change of direction of flow, loss at inlet & exit (No deduction, only statement of formulae and their application), total energy lines and hydraulic gradient lines.	6	8
UNIT V	**6.0 FLOW THROUGH OPEN CHANNELS** 6.1 Types of channel sections - rectangular, trapezoidal & circular, Discharge formulae: Chazy's and Manning's equation, best economical section, phenomenon of hydraulic jump (only description and no deduction)	8	9
UNIT - VI	**7.0 PUMPS** 7.1Types of pumps 7.2 Centrifugal pumps- basic principles, discharge, horse power of pump, efficiency of centrifugal pump, simple numerical problems 7.3 Reciprocating pumps: types, operation, discharge, calculation of horse power, efficiency, simple numerical problems	6	6
Practical	**PRACTICAL** 4.1 Determination of metacentric height of a floating body 4.2 Verification of Bernoulli's theorem 4.3 Determination of the co-efficients of discharge, contraction and velocity of an orifice 4.4 Determination of coefficient of discharge of a rectangular notch fitted in an open channel 4.5 Determination of coefficient of discharge of a V- notch fitted in an open channel 4.6 Determination of coefficient of discharge of a venturimeter, orificemeter fitted in a pipe	30	25

	4.7 Determination of head loss due to friction and coefficient of friction for flow through pipes. 4.8 Study of the parts of a centrifugal pump 4.9 Study of the parts of a reciprocating pump 4.10Demonstration of discharge measurement by a current-meter		
	Total	90 hrs	100

S.No	**Skills to be developed**
1.	**Intellectual skills:** 1. To Analyse and solve problems of hydrostatics and kinematics of fluid flow 2. To apply the basic principles of fluid mechanics for flow of fluid through orifices, pipes and over notches and weirs
2.	**Motor skills-** 1. To developed the understanding for operation of pumps
3	**Social skills-** 3. To work with peer as group 4. To communicate with teachers and peers to clarify doubts.

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Jagdish Lal	Hydraulics		Metro Publishing Boo ks Limited
S. Ramamrutham;	Hydraulics, Fluid Mechanics and Fluid Machines -		DhanpatRai & Sons, Delhi
P.N.Modi &S.M.Seth	Hydraulics, Fluid Mechanics including Hydaulic Machines	20^{th}	Standard Book House (New Delhi)
V. Thanikachalam,	Hydraulics and Hydraulic Machinery –		Tata McGraw-hill Publishing Compan y Limited

Name of the course : DESIGN AND DETAILING-I	
Course code: CE501	**Semester : Fourth**
Teaching Scheme	**Maximum Marks : 125**
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 10 Marks Attendance : 5 Marks
Practical : 2 hrs/week	End Semester Theory Exam:75 Marks
Credit : 4	PA Practical : 25 Marks

Rationale:

This course is designed to provide the students with the knowledge and skills of reinforced concrete design and detailing with the fundamental principles of design and relevant specifications as per Indian Standards.

Course Objective :-

Module/Unit	After completion of the course, students will be able to:
1.	Effectively design different types of structural elements made of different construction materials
2.	Apply the basic principles governing the design in a proper manner
3.	Apply the basic requirements envisaged in the relevant Indian Standards in design to ensure safety and serviceability of structures
4	Analyze and convey to others how success and failure of a major Civil Engineering project can have a severe impact on the human society
5	Translate theory to practice at the site including good quality detailing and fabrication
6	Update oneself regularly with latest technological developments in this field as the knowledge in this field is expanding in leaps and bounds

Pre-Requisite :-

Contents (Theory)		Hrs	Marks in %
UNIT - I	**1.0 INTRODUCTION** 1.1 Concept of reinforced cement concrete 1.2 Suitability of steel as reinforcing material 1.3 Salient Properties of concrete and different types of steel (mild steel, tensile steel, TMT and deformed bars)	3	5
UNIT - II	**2.0 LIMIT STATE METHOD OF DESIGN** 2.1 Overview of the working stress method of design and its evaluation to limit state method of design 2.2 Assumptions of LSM as per IS:456-2000 2.3 Stress strain diagram for concrete and steel 2.4 Limiting strains and corresponding stresses in concrete and steel, stress block parameters 2.5 Load factors and material safety factors 2.6 Concept of balanced section, under reinforced, Why over reinforced sections are not permitted 2.7 Design of Singly reinforced and doubly reinforced sections 2.8 Bond and development length as per IS code- in tension as well as in compression 2.9 Detail of longitudinal reinforcement with simple rules for curtailment for simply supported, cantilever and continuous beams.	12	20
UNIT - III	**3.0 SHEAR** 3.1 Relevant clauses of IS:456-2000 3.2 Design of vertical stirrups only 3.3 Detailing of stirrups	6	5
UNIT - IV	**4.0 COMPRESSION** 4.1 Concept of short and long column 4.2 Assumptions of IS:456-2000 4.3 Limiting strains and stresses 4.4 Design of axially loaded short column only with IS 456 requirements, minimum eccentricity 4.5 Detailing of longitudinal and transverse reinforcement as per IS 456-2000	8	10

UNIT - V	**5.0 FOOTING AND STAIRCASE** 5.1 Design of isolated footing under axial load only 5.2 Detailing of reinforcements 5.3 Layout of doglegged staircase with necessary details of all relevant parts and definitions 5.4 Typical detailing of a stair flight	6	15
UNIT - VI	**6.0 SLABS** 6.1 Basic difference between beam and slab 6.2 Behavior under uniformly distributed load 6.3 Supports for slab 6.4 Analysis and design of one- way and two way slab as per IS:456-2000 6.5 Detailing of reinforcement in slabs with simple rules for curtailment 6.6 Use of chair and corner bars	4	10
UNIT-VII	**7.0CONCEPT OF SEISMICS IN PLANNING AND DESIGN OF BUILDINGS** 7.1 Introduction to earthquakes 7.2 General principles and design criteria as per IS:1893-Part 1:2002 (has been revised in 2016) 7.3 Seismic Zoning, zones of different cities (IS:1893-Part 1, latest version) 7.4 Planning a building in a seismic prone area, general structural arrangement configuration, and requirements of earthquake resistance construction as per IS: 4326 7.5 Ductile detailing of R.C. structural elements as per IS:13920-2015, detailing of beams, columns and their junctions	6	10
Practical	**LIST OF DRAWINGS/ DEMONSTRATIONS** 1.0 Detailing of cantilever, simply supported, continuous beam and lintel. 2.0 Detailing of one way and two way slabs. 3.0 Detail of a column with typical foundation (isolated footing). 4.0 Detailing of staircase- dog legged 5.0 Reinforcement details of a RCC Water Tank	30	25
	Total	75 hrs	125
Practical :-			

S.No	Skills to be developed
1.	**Intellectual skills-** 1. To Apply the basic principle to the design and use the relevant Indian Standards in design to ensure safety and serviceability of structures
2.	**Motor skills-** **1.** To develop the understanding for design and detailing of Civil Engineering structures
3	**Social skills-** 1. To work with peer as group **2.** To communicate with teachers and peers to clarify doubts.

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
A.K Jain	Reinforced concrete- Limit state design		
B.C Punmia	Reinforced Concrete structures		
Pillai & Menon	Reinforced Concrete		
P.C Varghese	Reinforced Concrete		
	Design aids for reinforced concrete- IS: 456- SP 16		
	Handbook on concrete reinforcement and detailing- SP-34		

Name of the course : ESTIMATING - I	
Course code: CE504	**Semester : Fourth**
Teaching Scheme	**Maximum Marks : 125**
	PA and End Examination Scheme
Theory : 2 hrs/week	Class test: 10 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 10 Marks Attendance : 5 Marks
Practical : 4 hrs/week	End Semester Theory Exam:75 Marks
Credit : 4	Practical P.A Sessional : 25 Marks

Rationale:

The subject of estimating is very important for the diploma holders in Civil Engineering. In order to construct any item, pertaining to Civil Engineering, one should have knowledge of resource required for the works as also the money required for completion of the job.

Course Objectives:-

Module/ Unit	After completion of the course, students will be able to:
1.	Use IS 1200 for measurement & schedule of rates for estimation
2.	Estimate quantity of earthwork for a particular job and various items related road work
3.	Estimate quantity and cost of concrete (mass & reinforce cement) for a various job and prepare bar bending schedule for reinforced concrete work
4	Estimate quantity of material and cost for different types of flooring, finishing and decorating items of a particular job
5	Estimate requirement of sanitary and plumbing items and their cost in residential buildings
6	Estimate requirement of various components of timber and steel trusses and their cost
7	Estimate independently bill of quantities and cost of buildings (up to single storied RCC buildings with three rooms), roof trusses and typical bituminous road

Pre-Requisite :-

1	Basic knowledge of engineering drawing and mensuration

Contents (Theory)		Hrs	Marks
UNIT - I	**1.0 INTRODUCTION** 1.1What is estimating, uses of standard estimating forms,use of schedule of rates (procedure of taking out quantities) and mode of measurement as per IS:1200 1.2 Preparation of standard proforma of estimate and abstract of various engineering works 1.3 Unit of measurement and rate of payment	2	6
UNIT- II	**2.0 EARTH WORK** 2.1 Method of calculating quantity of earth, mid-sectional area method, prismodial formula method, lead and lift, tabular forms for each method of calculation such as building work,road work and canals. 2.2 Unit of measurement and method of estimating various items of work	2 2	8
UNIT - III	**3.0 MASONRY WORK** 3.1 Estimate of a masonry single room, Two room, three room building with varandah 3.2 Estimate hexagonal room 3.3 Estimate of guard wall, retaining wall	2	6
UNIT - IV	**4.0 CONCRETE WORK** 4.1 Method of estimating and costing mass concrete, reinforced concrete work and centering and shuttering		

	work, preparation of bar bending schedule and taking out quantities of steel reinforcement in RCC for load bearing wall type buildings, RCC framed structures, RCC slab culverts, RCC retaining walls etc.	4	10
UNIT-V	**5.0 FLOORING AND ROOFING** 5.1 Method of estimating and costing of floor, floor finishing and DPC 5.2 Estimate of RCC roof, truss and sloped roofing memebers with different roof cover 5.3 Estimate steel struss, gusset plate avd rivets	2	6
UNIT-VI	**6.0DOOR AND WINDOWS** 6.1Estimates of doors and windows for wood works and steel frame, fittings, shutters 6.2 Estimates different panels door shutter, glaze window shutter 6.3Estimate painting.	4	6
UNIT - VII	**7.0 FINISHING & DECORATING** 7.1 Unit of measurement and method of estimating plastering and pointing 7.2 Method of estimating white washing, colour and painting	2	6
UNIT - VIII	**8.0 SANITARY & PLUMBING** 8.1 Unit of measurement, method of estimating and costing of sanitary fittings and plumbing work in residential buildings	2	6
UNIT - IX	**9.0 STEEL WORK & TIMBER WORK** 9.1 Unit of measurement and method of estimating and costing of a simple steel structure 9.2 Unit of measurement, method of estimating and costing of timber work like roof trusses, timber bridges etc.	3	6

UNIT - X	**10.0ESTIMATING,ABSTRACTING AND BILLING OF COMPLETE ITEMS OF WORKS** 10.1 Double room/single storied building with wall foundation 10.2Double roomed single storied with front verandah, with wall foundation 10.3Three roomed single storied RCC framed building with front and back verandah 10.4 Timber roof and steel roof trusses 10.5 Bituminous road with cross slope	5	15
UNIT-XI	**11.0 PRACTICAL** 11.1 To estimate the volume of earthwork required for excavation and filling of the trench for road construction 11.2 To prepare an estimate for sanitary & plumbing as required in a building. 11.3 To prepare an estimate for timber works for a roof trussed building. 11.4 To prepare an estimate for flooring items including finishing and decorating works 11.5 To prepare an estimate of a double storied R.C. building	60	25
	Total	90 hrs	100

Practical :-

Sl.No	Skills to be developed
1.	**Intellectual skills-** 3. To Use IS 1200 for measurement & schedule of rates for estimation 4. To Estimate bill of quantities and cost of double storied residential house 5. To Estimate the bill of quantities and cost of roof trusses 6. To Estimate the bill of quantities and cost of typical road section
2.	**Motor skills : Not Applicable**
3	**Social skills-** 5. To work with peer as group 6. To communicate with teachers and peers to clarify doubts.

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
B.N. Dutta	Estimating and costing		
D.D. Kohli & R.C. Kohli	A Text Book of Estimating Costing a nd Accounts	Revised Edition	S. Chand Publishing
M. Chakraborty	Estimating, Costing and Specification		
S. C. Rangwala	Estimating, Costing & Valuation		

Name of the course : COMPUTER AIDED DRAWING	
Course code: CE508	**Semester : Fourth**
Teaching Scheme	**Maximum Marks : 50**
	PA and End Examination Scheme
Theory : 0 hrs/week	Class test: 0 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 0 Marks Attendance : 0 Marks
Practical : 3 hrs/week	End Semester : 0 Marks
Credit : 2	PA Practical : 50 Marks

Rationale:

Drawing is very important for diploma holders in Civil Engineering. Now adays different softwares are available for efficient drawing. This course provides students with a broad introduction into 2-dimensional and 3-dimensional Computer-Aided Drawing (CAD) with a focus on construction- and architecture-specific applications. Students will learn how to use industry-leading CAD software programs (Autodesk AutoCAD) to draw construction projects, and then create and distribute basic, industry-standard architectural drawings.

The students should have basic understandings about computer aided drawing.

Course Objective :-

Module/ Unit	After completion of the course, students will be able to:
1.	Demonstrate basic concepts of the AutoCAD software
2.	Apply basic concepts to develop construction (drawing) techniques
3.	Ability to manipulate drawings through editing and plotting techniques to assemble these drawings in industry-standard plan form and produce plotted hardcopies ready for distribution;
4	Understand geometric construction
5	Produce template drawings
6	Construct accurate 2D geometry as plan view, elevations and sections
7	Understand and demonstrate dimensioning concepts and techniques
8	Become familiar with the use of Blocks, Design Center, and Tool Palettes

9	Become familiar with Solid Modelling concepts and techniques and construct complex 3D shapes and surface objects		
Pre-Requisite :-			
	CE 302		
Contents (Theory)		Hrs	Marks in %
UNIT - I	**INTRODUCTION & RECALLING DIFFERENT TOOLS** 1.1Recall drawing tools, objects, text, hatch 1.2Recall editing Tools	2	5
UNIT-II	**CREATEING and EDITING PROPERTIES OF OBJECT** **2.1** Command for creating objects like – draw line, polyline rectangle, circle, arc, polygon etc. all modifying command 2.2 Command for modify the objects like-copy, erase, move, rotate, array, join, break, mirror etc. all	9	12
UNIT-III	**WORKING WITH BLOCK, LAYER AND TEXT** 3.1 Creating and editing layers 3.2 Creating and editing blocks 3.3 Creating and editing text- Writing texts on Drawings	8	11
UNIT-IV	**OBJECT DIMENSIONING** 4.1 Setting dimension 4.2 Find angular, linear, radial distances 4.3 Making use of different settings of drawings related to scale unit, co-ordinate system. 4.4 Dimensioning, drawing section lines and hashed section lines	8	7
UNIT-V	PLOTTING OF DRAWING 5.1 Plot drawing	3	5
UNIT - VI	3D modeling with AutoCAD (Surfaces, Solids)	15	10

Total	45 hrs	50

Practical :-

S.No	Skills to be developed
1.	**Intellectual skills-** 1. To Apply basic concepts to develop drawing techniques 2. To Use of software for drawing
2.	**Motor skills-** 1. To Handle the drawing software
3	**Social skills-** 1. To work with peer as group 2. To communicate with teachers and peers to clarify doubts.

Text /Reference Books:

Name of Authors	Titles of the Book	Edition	Name of the Publisher
N.D. Bhatt	Elementary Engineering Drawing -		Charotar Publishing House
G.R. Nagpal	Geometrical Drawing -		Khanna Publishers
Prof. C. H. Khadilkar	A Text book Of Bridge Construction by -		Allied Publishers Bombay, New Delhi and Calcutta.
Warren J. Luzadder	Graphics for Engineers -		Prentice Hall of India (Pvt.) Ltd.
N.D. Bhatt	Elementary Engineering Drawing -		Charotar Publishing House
Donnie Gladfelte	AutoCAD and AutoCAD LT (any recent version): No Experience Required		Sybex
Alexander Schreyer	Architectural Design With SketchUp		John Wiley & Sons

Name of the course : CE WORKSHOP	
Course code: CE408	**Semester : Fourth**
Teaching Scheme	**Maximum Marks : 75**
	PA and End Examination Scheme
Theory : 0 hrs/week	Class test: --- 0
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 0 Attendance : 0
Practical : 3 hrs/week	End Semester Theory Exam:---0
Credit : 2	PA : 50 Marks Viva voce :25

Rationale:

The subject of CE workshop is very important for the diploma holders in Civil Engineering.
In order to effectively supervise and monitor constructin activities, he should have prior knowledge about construction procedure and environment of the workplace and construction areas. This will enable them to have hands on practice about various activities related to civil engineering construction.

Course Objectives:-

Module/ Unit	After completion of the course, students will be able to:
1.	Supervise different types of welding jobs and identify defects
2.	Identify, supervise and monitor various plumbing and sanitary works
3.	Give layout for simple structures. Supervise various masonry, concreting and laying reinforcement in civil engineering construction works as per Indian standard code of practice.
4	Study drawing for electrical wiring. Identify, oversee various electrical installation in buildings
5	Coordinate electrical installation jobs during civil construction

Pre-Requisite :-

1	Basic work ethics in workshop

	Contents (Theory)	Hrs	Marks
UNIT - I	**WELDING SHOP** **1.0 SHOP TALK** 1.1 What is welding and its engineering importance 1.2 Safety precautions to be observed during welding 1.3 Types of welding – Gas and Arc. 1.4 Equipment and accessories required for high and low pressure gas welding, their functions with demonstration. Adjustment of flame and their characteristics, use of flux, filler rod and their specifications. 1.5 Arc welding tools and equipment, their functions with demonstrations, selection and specification of electrodes. 1.6 Common welding joints and their edge preparation 1.7 Welding defects and maintenance of arc and gas welding equipment 1.8 Demonstration of cutting by Gas. **2.0 SHOP PRACTICE** 2.1 Practice on gas welding, setting of flame carbonizing, neutral and oxidizing, metal depositing using filler rod on 4 mm. Thick flat or sheet and running a single bead. 2.2 Practice on are welding fusion run on M.S. flat bar 6mm.thick both left ward and right ward for hand balancing. 2.3 Single Vee-Belt joint on M.S. flat 4 to 6 mm. thick with at least two runs.	4 4	8

UNIT- II	**PLUMBING SHOP** **3.0 SHOP TALK** 3.1 Role of plumbing in our day to day life 3.2 Description and use of plumbing tools and equipment 3.3 Plumbing materials and fitting e.g. various types of valves, taps etc. with demonstrations. 3.4 Pipe threading with die set 3.5 G. I. Pipe joints (flange, union, nipple sockets) C.P.A.C. and polyethylene pipe joints (with practical demonstration of at least two pipe joints) 3.6 Study and demonstration of various types of water supply and sanitary fittings with layout. 3.7 Study of simple hand pumps and centrifugal pumps 3.8 Estimation of water supply and sanitary fittings for a domestic Building. **4.0 SHOP PRACTICE** 4.1Practice of thread cutting on G. I. Pipes with adjustable click (making a short nipple) 4.2 Practice of thread cutting on both ends and bending of G.I. pipe pieces (making a G.I. bend) 4.3 Practice on cast iron to cast iron pipe joint using lead. 4.4Practice on joining two A.C. Pipes with cement mortar 4.5 Practice on water pipe line connection for water tap, shower, wash basin and water closet (group task)	2 4	6
UNIT - III	**R.C.C AND MASONRY SHOP** **5.0 SHOP TALK** 5.1 Role of R.C.C. and Masonry work in the field of construction 5.2 Demonstration of various tools and equipment used in various R.C.C. and masonry work. 5.3 Common materials used for R.C.C. and Masonry works 5.4 Various brick bonds and use of closer, plastering, flooring 5.5 Bending and binding M.S. rods for RCC structure (Lap, hook, crank-up bar) 5.6 Lay-out of building plinth in the field 5.7 White washing and distempering preparation and demonstration	6	20

	5.8 Form work of RCC structure-column, beam and slab. 5.9 Method of inspection of a job. **6.0 SHOP PRACTICE** 6.1Preparation of cement Mortar at a given proportion for plastering 6.2 Practice on brick bond - (i) English bond (ii) Flemish bond for a corner wall and a Tee-joint 6.3Casting of Reinforced cement concrete beam/slab with given proportion (a) preparation of reinforcement including stirrups (b) study and rovision of cover and form work (c) preparation of dry mixture and its calculation (d) methods of mixing and casting of the beam/slab (e) curing. 6.4 Lay-out of a simple building (single storeyed) 6.5 Making of mosaic tiles (size about 150 mm. x 150 mm. x 20 mm. thick)	12	
	ELECTICAL SHOP **7.0 SHOP TALK** 7.1Electrical shop work and their utility in day to day life 7.2Safety precautions to be observed during handling and Operating electrical equipment, electrical shock treatment procedure. 7.3Common conductors and insulators (with display) 7.4Various types of cable and materials for earthing 7.5Common types of house wiring surface and concealed wiring 7.6Various types of domestic wiring, fitting and their positions 7.7Testing of installations (demonstration) **8.0 SHOP PRACTICE** 8.1Wiring with single and twin core cable connecting main switch and D.F.B., pendent lamp, bracket lamp, socket outlet, switch, installation of earth wire. 8.2 Testing of electrical installation as per IE Rules, Trouble shooting of minor faults house or workshop wiring with some fault. 8.3 Study of drawing for wiring of a two-storied building.	4 9	16
	Total	45 hrs	50

Practical :-	
Sl. No	**Skills to be developed**
1.	**Intellectual skills-** 5. Supervising skill for execution of Civil engineering construction works 6. Identification and solving problems during and after construction 7. Coordinating with labours, co-workers and immediate supervisor
2.	**Motor skills :** 1. Operate and maintain equipment
3	**Social skills-** 7. Will learn to work with labour and peer as group 8. Able to communicate with professional and peers to clarify doubts.

Name of the course : PROFESSIONAL PRACTICES- III	
Course code: CE514	**Semester : FOURTH**
Teaching Scheme	**Maximum Marks : 50**
	PA and End Examination Scheme
Theory : 0 hrs/week	Class test: 0 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 0 Marks Attendance : 0 Marks Sessional : 50
Practical : 2 hrs/week	End Semester Theory Exam: 0 Marks
Credit : 1	Practical Exam: 0 Marks

Rationale / Aim :-

Interaction with industry is essential for proper understanding regarding implementation procedure of the theoretical knowledge gained during course of study. The course contents of professional practice-III are designed to develop interpersonal skill and adoptability to the industry so that the student will be benefited in their professional carrier.

Course Objective :-

Module/Unit	After completion of the course, students will be able to:
1.	Interact with peers to share thoughts.
2.	Implement conceptual idea into practise
3.	Prepare proper work schedule
4.	Effectively manage and enforce the work schedule at site
5.	Implement safety precautions
6.	Resolve problems arising from disputes at site and look after the quality control at the site

Pre-Requisite :- Professional Practice II (CE 513)

1			
Contents		Hrs.	Marks
UNIT - I	1.0 INTRODUCTION 1.1Aims & objectives of construction management 1.2 Functions of construction management 1.3 The construction team components-owner, engineer, architect,contractor-their functions and interrelationship and jurisdiction 1.4 Resources for construction management-men, machines, materials, money 1.5 Collecting an estimate from P.W.D.	03	5
UNIT-II	2.0 CONSTRUCTIONAL PLANNING: 2.1 Importance of constructional planning 2.2 Developing work break down structure for construction works 2.3Construction planning stages- Pretender stage, Post- tender stage 2.4Construction scheduling by bar charts preparation ofbar charts for simple construction works 2.5 Preparation of schedules for labour.Materials,machinery, finance for small works 2.6 Limitations of bar charts 2.7 Construction scheduling by network techniquesdefinitions of terms, PERT and CPM techniques,advantages and disadvantages of two techniques,network analysis, estimation of time and critical path,application of PERT & CPM techniques in simpleconstruction works	06	12
UNIT - III	3.0 SITE MANAGEMENT 3.1Factors influencing selection, design and layout of temporary facilities and services at construction site 3.2 Principles of storing materials at site 3.3 Location of equipment Organizing labour at site	03	05

UNIT - IV	4.0 CONSTRUCTION ORGANIZATION: 4.1Organization types line and staff, functions and their Characteristics 4.2 Principles of organization-meaning and significance of terms-control, authority, responsibility, command, accountability, job and task 4.3Leadership-necessity, styles of leadership, role of leader 4.4 Principles of effective supervision 4.5Motivation-classification of motives, different approaches to motivation 4.6Human relations-relations with subordinates, peers,Supervisors, characteristics of group behaviour, mob psychology, handling of grievances, absenteeism. Labour Welfare 4.7 Conflicts in organization- genesis of conflicts, types - Intrapersonal, interpersonal, inter group, resolving conflicts, team building	07	12
UNIT - V	5.0 SAFETY IN CONSTRUCTION WORKS: 5.1Importance of safety 5.2Causes and effects of accidents in construction works 5.3 Safetymeasures in work sites for-excavation, scaffolding, formwork, fabrication and erection, demolition 5.4 Development of safety consciousness 5.5Safety legislation-workmen's compensation act, contract labour act	04	05
UNIT - VI	6.0 DISPUTES: 6.1 Nature of disputes between contractor and owner Causes of disputes and claims Arbitration-procedure, criterion for arbitrator, conditions for arbitration.	04	06

UNIT - VII	7.0 QUALITY CONTROL: 7.1 Concept of quality in construction 7.2 Qualitystandards -during construction, after construction 7.3 Methods of testing-during construction, afterconstruction, Destructive &non-destructive methods	03	05
	Total	30hrs	50
Practical :-			

S.No	**Skills to be developed**
1.	**Intellectual skills-** 5. To Interact with industry people- executive and working level 6. To Implement of work schedule 7. To Exchange the ideas. 8. To Adopt safety precautions.
2.	**Motor skills-** 2. To develope of managerial and quality control skill.
3	**Social skills-** 4. To develope of ethics. 5. To work with peer as group. 6. To keep safe and amicable working environment