

SANDIP UNIVERSITY, SIJOUL, MADHUBANI
I SEMESTER DIPLOMA IN CIVIL ENGINEERING
Skill Based Diploma in Engineering Course
APPLIED MATHEMATICS (CE101T)

Subject Code CE101T	Theory						Credits
	No. of Periods Per Week						Full Marks
	L	T	P/S	ESE	:	100	
	04	—	—	TA	:	70	
	—	—	—	CT	:	10	
			CT	:	20		

Contents :Theory		Hrs/week	Marks
Unit -1	<p>INTEGRATION:</p> <p>Definition of integration as anti-derivative. Integration of standard function. Rules of integration (Integrals of sum, difference, scalar multiplication). Methods of Integration. Integration by substitution Integration of rational functions. Integration by partial fractions. Integration by trigonometric transformation. Integration by parts. Definite Integration. Definition of definite integral. Properties of definite integral with simple problems.</p> <p>Applications of definite integrals. Area under the curve. Area bounded by two curves, Volume of revolution. Centre of gravity of a rod, plane lamina. Moment of Inertia of uniform rod, rectangular lamina Theorems of parallel and perpendicular axes.</p>	10	20
	<p>Area under the curve. Area bounded by two curves, Volume of revolution. Centre of gravity of a rod, plane lamina. Moment of Inertia of uniform rod, rectangular lamina Theorems of parallel and perpendicular axes.</p>	08	10
Unit -2	<p>DIFFERENTIAL EQUATION</p> <p>Definition of differential equation, order and degree of differential equation. Formation of differential equation for function containing single constant. Solution of differential equations of first order and first degree such as variable separable type, reducible to Variable separable, Homogeneous, Nonhomogeneous, Exact, Linear and Bernoulli equations.</p> <p>Applications of Differential equations. Rectilinear motion (motion under constant and variable acceleration) Simple Harmonic Motion.</p>	10	10
Unit – 3	<p>PROBABILITY DISTRIBUTION</p> <p>Binomial distribution. Poisson's distribution. Normal distribution Simple examples corresponding to production process.</p>	08	10

Unit – 4	NUMERICAL METHODS		
	Solution of algebraic equations Bisection method. Regulafalsi method. Newton – Raphson method.	06	06
	Solution of simultaneous equations containing 2 and 3 unknowns Gauss elimination method. Iterative methods- Gauss seidal and Jacobi’s methods.	06	06
	Total	48	70

Text / Reference Books :-		
Titles of the Book	Name of Authors	Name of the Publisher
Mathematics for polytechnic	S. P. Deshpande	Pune Vidyarthi Griha Prakashan, Pune
Calculus: single variable	Robert T. Smith	Tata McGraw Hill
Advanced Mathematics for Engineers and Scientist	Murray R Spiegel	Schaum outline series McGraw Hill
Higher Engineering Mathematics	B. S. Grewal	Khanna Publication, New Dehli
Introductory Methods of Numerical analysis	S. S. Sastry	Prentice Hall Of India New Dehli
Numerical methods for Engg. 4 th ed.	Chapra	Tata McGraw Hill
Numerical methods for scientific & engineering computations	M. K. Jain & others	Wiley Eastern Publication.
Applied Mathematics	Rajendra Pal, S.N. Malik	Foundation Publishing

BUILDING DRAWING (CE102T)

Subject Code CE102T	Theory						Credits
	No. of Periods Per Week			Full Marks			03
	L	T	P/S	ESE	:	100	
	03	—	—	TA	:	70	
	—	—	—	CT	:	10	
—	—	—	CT	:	20		

CONTENTS : THEORY

Name of the Topic		Hrs/week	Marks
Unit -1	1 Conventions Conventions as per IS:962-1967 and other practices 2 Types of Lines – Visible line, Centerline, Hidden line, Section line, Dimension line, Extension line, Pointers, Arrow heads or dots. Symbols – Materials used in construction, building components 3 Reading of available ammonia prints of residential buildings.	04	03
Unit -2	Planning Of Building Principles of planning of Residential and Public building. Space requirements and norms for various units of Residential and Public building. Rules and byelaws of local governing authorities for construction. Drawing of line plans for Residential and Public building.	06	14
Unit – 3	Types Of Drawing Development of lineplan Elevation Section Site plan Location Plan Foundation plan Area statement and other details. Measured Drawing and its significance Submission Drawing and Working Drawing	26	45
Unit – 4	Perspective Drawing Definition, Necessity, Principles of Perspective Drawing, Terms used in perspective drawing Two point perspective view of a small object like pedestal, step block, small single storied building with flat roof etc.	12	08
Total		48	70

Text /Reference Books:-

Titles of the Book	Name of Authors	Name of the Publisher
Text Book of Building Drawing	Shah, Kale, Patki	-
Elements of Building Drawing	D. M. Mahajan	Pune Vidyarthi Griha Prakashan
Planning and Design of Building.	Y. S. Sane	
Civil Engineering Drawing	Malik & Mayo	New Asian Publishers New Delhi
Civil Engg. Drawing & House Planning	B.P. Verma	Khanna Publishers, Delhi
Bulding Planning & Drawing	S.S Bharikatti M.V. Chitawadegi	I.K International Publishing House.
Building Drawing	Nagrajan	Foundation Publishing

BUILDING CONSTRUCTION (CE103T)

Subject Code CE103T	Theory						Credits
	No. of Periods Per Week			Full Marks		:	100
	L	T	P/S	ESE		:	70
	03	—	—	TA		:	10
	—	—	—	CT		:	20

CONTENTS : THEORY

	Name of the Topic	Hrs/week	Marks
Unit -1	<p>BUILDING COMPONENTS AND MATERIALS BUILDING COMPONENTS AND TYPES OF STRUCTURE BUILDING COMPONENTS & THEIR FUNCTION. SUBSTRUCTURE – FOUNDATION, PLINTH. SUPERSTRUCTURE – WALLS, SILL, LINTEL, DOORS & WINDOWS, FLOOR, ROOF, PARAPET, BEAMS, COLUMNS. TYPES OF STRUCTURES – LOAD BEARING STRUCTURES, FRAMED STRUCTURES, COMPOSITE STRUCTURES. MASONRY MATERIALS A) BUILDING STONES- CLASSIFICATION OF ROCKS, REQUIREMENT OF GOOD BUILDING STONE, DRESSING OF STONES, QUARRYING OF STONES ,ARTIFICIAL OR CAST STONES B) BRICKS– CONVENTIONAL BRICKS , STANDARD BRICKS COMPOSITION OF CLAY BRICK, STRENGTH OF BRICKS, PROPORTIONS OF BURNT CLAY BRICKS , TESTING OF BRICKS , SPECIAL BRICKS ,HOLLOW BLOCKS , FLY ASH BRICKS. C) MORTARS – CLASSIFICATIONS, LIME MORTAR, CEMENT MORTAR, SPECIAL MORTARS. FUNCTIONS OF MORTAR, PROPORTIONS, PROPERTIES OF MORTAR AND TESTS FOR MORTAR. TIMBER BASED MATERIAL USE OF TIMBER, CHARACTERISTICS OF GOOD TIMBER, DEFECTS IN TIMBER, PLYWOOD, PARTICLE BOARD ,VENEER, SUN MICA , FORE MICA, NUWOOD, ARTIFICIAL TIMBER, RUBBER WOOD. MISCELLANEOUS MATERIALS GLASS, PLASTIC, FIBERS, ALUMINIUM, STEEL , GALVANIZED IRON, ASPHALT BITUMEN ETC .MICRO SILICA, PVC, CPVC, PPF. WATERPROOFING AND TERMITE PROOFING MATERIALS, ADMIXTURES IN CONCRETE, BONDING AGENTS, EPOXY RESINS, POLISHING MATERIALS ETC</p>	06	10
Unit -2	<p>CONSTRUCTION OF SUBSTRUCTURE JOB LAYOUT SITE CLEARANCE, PREPARING JOB LAYOUT, LAYOUT FOR LOAD BEARING STRUCTURE AND FRAMED STRUCTURE BY CENTER LINE AND FACE LINE METHOD, PRECAUTIONS WHILE MARKING LAYOUT ON GROUND . EARTHWORK EXCAVATION FOR FOUNDATION, TIMBERING AND STRUTTING EARTHWORK FOR EMBANKMENT MATERIAL FOR PLINTH FILLING. TOOLS AND PLANTS USED FOR EXCAVATION AND EARTHWORK. FOUNDATION TYPES OF FOUNDATION – OPEN FOUNDATIONS, SHALLOW FOUNDATION, STEPPED FOUNDATION, ISOLATED AND COMBINED COLUMN FOOTING, RAFT FOUNDATION, DEEP FOUNDATION AND PILE FOUNDATION. PUMPING METHOD OF DEWATERING, COFFERDAMS. BEARING CAPACITY OF FOUNDATION SOIL, UNDER REAMED PILE FOUNDATION.</p>	06	12

Unit -3	<p>CONSTRUCTION OF SUPERSTRUCTURE</p> <p>STONE MASONRY</p> <p>TERMS USED IN STONE MASONRY – FACING, BACKING, HEARTING, THROUGH STONE, CORNER STONE.</p> <p>UNCOURSED RUBBLE MASONRY, COURSED RUBBLE MASONRY, POINT TO BE OBSERVED IN CONSTRUCTION OF STONE MASONRY, MORTARS FOR STONE MASONRY, TOOLS AND PLANTS USED FOR STONE MASONRY, COL-GROUT MASONRY.</p> <p>BRICK MASONRY</p> <p>COMMON TERMS USED IN BRICK MASONRY, REQUIREMENTS OF GOOD BRICKWORK, BONDS IN BRICK MASONRY, ENGLISH, FLEMISH, STRETCHER AND HEADER BONDS ONLY.</p> <p>BRICK LAYING ,LINE LEVEL AND PLUMB OF BRICKWORK, STRIKING AND RAKING OF JOINTS, LEAD AND LIFT, PRECAUTIONS IN BRICK MASONRY, TOOLS AND PLANTS USED IN BRICK MASONRY .</p> <p>COMPARISON BETWEEN BRICK AND STONE MASONRY. HOLLOW CONCRETE BLOCK MASONRY, COMPOSITE MASONRY ,</p> <p>CAVITY WALL- PURPOSE AND CONSTRUCTION.</p> <p>DOORS AND WINDOWS</p> <p>Doors-Components and construction of panelled doors, battened doors, flush doors, collapsible doors, rolling shutters, Revolving doors, Glazed doors. Sizes of door.</p> <p>Windows -Component and construction of fully panelled, partly panelled and glazed, glazed wooden, steel, Aluminum windows, sliding windows, louvered window, ventilators, cement grills. Protective treatment for doors and windows, fixtures and fastenings for doors and window.</p> <p>SILL, LINTEL AND WEATHER SHED - FUNCTIONS, TYPES AND CONSTRUCTION .</p> <p>VERTICAL COMMUNICATION</p> <p>MEANS OF VERTICAL COMMUNICATION – STAIR CASE, ELEVATOR OR OF GOOD STAIRCASE, TYPES OF STAIRCASE, FABRICATED STAIR.</p> <p>SCAFFOLDING AND SHORING</p> <p>PURPOSE, TYPES OF SCAFFOLDING, PROCESS OF ERECTION AND DISMANTLING. PURPOSE AND TYPES OF SHORING, UNDERPINNING, SAFETY PRECAUTIONS.</p>	20	24
Unit -4	<p>4. Building Finishes</p> <p>FLOORS AND ROOFS</p> <p>FLOOR FINISHES- SHAHABAD , KOTA, MARBLE, GRANITE ,KADAPPA, CERAMIC TILES ,VITRIFIED , MOSAIC TILES ,CHEQUERRED TILES, GLAZED TILES ,PAVEMENT BLOCKS , CONCRETE FLOORS, TREMIX FLOOR, SKIRTING AND DADO.</p> <p>PROCESS OF LAYING- PROCESS OF LAYING AND CONSTRUCTION, FINISHING AND POLISHING OF FLOORS.</p> <p>ROOFING MATERIALS – AC SHEETS ,G.I. SHEETS, PLASTIC SHEETS, FIBRE SHEETS, MANGALORE TILES ETC. STEEL TRUSSES. R.C.C. SLAB</p> <p>WALL FINISHES</p> <p>PLASTERING – NECESSITY OF PLASTERING, SINGLE COAT PLASTER DOUBLE COAT PLASTER , NEERU FINISHING AND POP, SPECIAL PLASTERS STUCCO PLASTER , PLASTER BOARD AND WALL CLADDINGS. PRECAUTION TO BE TAKEN WHILE PLASTERING. DEFECTS IN PLASTER.</p> <p>POINTING – NECESSITY AND PROCEDURE OF POINTING.</p> <p>PAINTING – NECESSITY, SURFACE PREPARATION, METHOD OF APPLICATION, SELECTING SUITABLE PAINTING MATERIAL, WHITE WASH AND COLOUR WASH.</p>	16	24
Unit -5	<p>5. BUILDING MAINTENANCE</p> <p>CRACKS</p> <p>CAUSES AND TYPES OF CRACKS, IDENTIFICATION AND REPAIR OF CRACKS. GUNITING AND GROUTING, USE OF EPOXY AND CRACK FILLS.</p>		

SETTLEMENT SETTLEMENT --CAUSES AND REMEDIAL MEASURES PLINTH PROTECTION – NECESSITY AND MATERIALS USED. DEMOLITION NECESSITY, METHOD OF DEMOLITION-HAND DEMOLITION, MACHINE DEMOLITION, CONTROLLED BLASTING DEMOLITION, PRECAUTIONS DURING DEMOLITION. REBARING TECHNIQUES NECESSITY AND EQUIPMENT FOR REBARING TECHNIQUES		
	TOTAL	48 70

Text / Hand Books:-		
Titles of the Book	Name of Authors	Name of the Publisher
Construction Materials	D.N. Ghose	Tata McGraw-Hill
Building materials	Amarjit Agrawal	New India Publication
Building materials	S. K. Duggal	New Age International
Engineering materials	Sharma	PHI Publication
Building Construction	S. P. Arora and Bindra	Dhanpat Rai Publication
Building Construction	S. C. Rangawala	Charotar Publication
Building Construction	Sushil Kumar	Standard Publication
Building Construction	B. C. Punmia	Laxmi Publication
Building Construction	S.K. Sharma	Tata McGraw-Hill
Civil Engineering materials	TTTI ,Madras	TTTI ,Madras
Building Construction	Dr.Janardan Zha	Khanna Publication
A to Z of Building Construction	Mantri Construction	Mantri Publication
Building Construction Vol. I to IV	W. B. Mackay	Longman(ELBS)
PWD Handbooks for -Materials - Masonry -Building -Plastering and Pointing - Foundation	All India Council for Technical Education	All India Council for Technical Education
Practical Civil Engineering Handbook	Khanna	Khanna Publication
Building Construction	S.N. Srivastava, VS Dubey	Foundation Publishing

ENGINEERING MECHANICS (CE104T)

Subject Code CE104T	Theory			No of Period in one session :			Credits 03
	No. of Periods Per Week			Full Marks			
	L	T	P/S	ESE	:	70	
	03	-	—	TA	:	10	
	—	—	—	CT	:	20	

Contents		Hrs/week	Marks
Unit -1	<p>Force</p> <p>a. Fundamentals: - Definitions of mechanics, statics, dynamics. Engineering Mechanics, body, rigid body, mass, weight, length, time, scalar and vector, fundamental units, derived units, S.I. units.</p> <p>b. Force: - Definition of a force, unit force, Newton, S.I. unit of a force, representation of a force by vector and by Bow's notation method. Characteristics of a force, effects of a force, principle of transmissibility.</p> <p>c. Resolution of a force: Definition, Method of resolution, Types of component forces, Perpendicular components and Non-perpendicular components.</p> <p>d. Moment of a force: - Definition, measurement of moment of a force, S. I. unit, geometrical meaning of moment of a force, classification of moments according to direction of rotation, sign convention, law of moments Varignon's theorem of moment and it's use, couple – definition, S.I. unit, measurement of a couple, properties of couple.</p> <p>e. Force system: - Definition, classification of force system according to plane and line of action</p> <p>f. Composition of Forces: - Definition, Resultant force, methods of composition of forces,</p> <p style="margin-left: 40px;">I – Analytical method:– (i) Trigonometric method (law of parallelogram of forces) (ii) Algebraic method (method of resolution),</p> <p style="margin-left: 80px;">II – Graphical method: - Introduction, space diagram, vector diagram, polar diagram, and funicular polygon. Resultant of concurrent, non-concurrent and parallel force system by analytical and graphical method.</p>	12	15

Unit -2	<p>Equilibrium: Definition, conditions of equilibrium, analytical and graphical conditions of equilibrium for concurrent, non-concurrent and parallel force system, free body and free body diagram. Lami's Theorem – statement and explanation, Application of Lami's theorem for solving various engineering problems. Equilibrant – Definition, relation between resultant and equilibrant, equilibrant of concurrent and non-concurrent force system. Beams – Definition, Types of beams (cantilever, simply supported, overhanging, fixed, continuous), Types of end supports (simple support, hinged, roller), classification of loads, point load, uniformly distributed load. Reactions of a simply supported and over hanging beam by analytical and graphical method.</p>	10	15
Unit – 3	<p>Friction: Definition of friction, force of friction, limiting frictional force, coefficient of friction, angle of friction, angle of repose, relation between angle of friction angle of repose and coeff. Of friction. Cone of friction, types of friction, laws of friction, advantages and disadvantages of friction. Equilibrium of bodies on level plane –external force applied horizontal and inclined up and down. Equilibrium of bodies on inclined plane – external forces is applied parallel to the plane, horizontal and incline to inclined plane. Ladder friction, Wedge and block.</p>	08	15
Unit – 4	<p>Centroid and Centre Of Gravity: Centroid: Definition of centroid. Moment of an area about an axis. Centroid of basic geometrical figures such as square, rectangle, triangle, circle, semicircle and quarter circle. Centroid of composite figure. Center of gravity: Definition, center of gravity. Of simple solids such as cylinder, sphere, hemisphere, cone, cube, and rectangular block. Centre of gravity of composite solids.</p>	08	10
Unit – 5	<p>Simple Machines: Definitions of simple machine, compound machine , load , effort , mechanical advantage , velocity ratio , input on a machine ,output of a machine ,efficiency of a machine , expression for mechanical advantage , velocity ratio and efficiency of a machine. Ideal machine, ideal effort and ideal load, friction in machines, effort lost in friction and frictional load. Law of machine, maximum mechanical advantage and maximum efficiency of a machine, reversibility of a machine, condition for reversibility of a machine, self locking machine. Study of simple machines : Simple axle and wheel, differential axle and wheel, Weston's differential pulley block, single purchase crab, double purchase crab, worm and worm wheel, geared pulley block, screw jack, pulleys : First, second and third system of pulleys, gear train, hoist mechanism.</p>	10	15
Total		48	70

Text/Reference Books :-

	Titles of the Book	Name of Authors.	Name of the Publisher
(i)	Engineering Mechanics	Beer-Johnson	Tata McGraw Hill, Delhi
(ii)	Engineering Mechanics	Basu	Tata McGraw Hill, Delhi
(iii)	Vector Mechanics for Engineers Vol. - I & II	Joslph F. Shelley	Tata McGraw Hill, Delhi

CONCRETE TECHNOLOGY(CE105T)

Subject Code CE105T	Theory						Credits
	No. of Periods Per Week			Full Marks	:	100	03
	L	T	P/S	ESE	:	70	
	03	—	—	TA	:	10	
	—	—	—	CT	:	20	

CONTENTS : THEORY

	Name Of The Topic	Hrs/week	Marks
Unit -1	<p>Properties of Cement: Physical properties of Ordinary Portland cement (OPC), determination and test on OPC ,Hydration of cement, physical properties of cement – fineness, standard consistency, initial & final setting times, compressive strength & soundness, different grades of opc 33, 43 , 53 & their specification of physical properties as per relevant I. S. codes. Adulteration of cement (field test), storing cement at site, effect of storage of cement on properties of cement / concrete.</p> <p>Types of Cement Physical properties, specifications as per relevant IS codes & field application of the following types of cement</p> <ul style="list-style-type: none"> i) Rapid hardening cement ii) Low heat cement iii) Pozzolana Portland cement iv) Sulphate resisting cement vi) Blast furnace slag cement vii) White cement 	06	10
Unit -2	<p>Properties of Aggregates :</p> <p>Properties of fine aggregates : Concept of size, shape, surface texture, strength, specific gravity, bulk density , water absorption, surface moisture, soundness, bulking impurities</p> <p>Determination of fineness modulus & grading zone of sand by sieve analysis, determination of silt content in sand & their specification as per IS 383</p> <p>Bulking of sand, phenomenon of bulking, its effect on concrete mix proportion.</p> <p>Properties of coarse aggregates : Concept of size, shape, surface texture, water absorption, soundness, specific gravity & bulk density</p> <p>Determination of fineness modulus of coarse aggregate by sieve analysis, grading of Coarse Aggregates</p> <p>Determination of crushing value, impact value & abrasion value of coarse aggregate, flakiness index & elongation index of coarse aggregate and their specification.</p>	08	15

<p>Unit – 3</p>	<p>Properties of Concrete: Introduction to concrete - Definition of concrete, necessity of supervision for concreting operation, different grades of concrete (ordinary concrete, standard concrete & high strength concrete as per provisions of IS 456- 2000), minimum grade of concrete for different exposure conditions, minimum grade of concrete for R.C.C., water retaining structure & in sea water construction, durability of concrete.</p> <p>Water cement ratio Definition of w/c ratio, Duff Abraham w/c law, significance of w/c ratio, selection of w/c ratio for different grades of concrete prepared from different grades of OPC as per graphs specified in IS 10262 -1982, maximum w/c ratio for different grades of concrete for different exposure conditions.</p> <p>Properties of fresh concrete Definition of workability, factors affecting workability of concrete. Determination of workability of concrete by slump cone test, compaction factor test, vee bee consistometer & flow table tests. Range values of workability requirement for different types of concrete works, cohesiveness, segregation, harshness, bleeding.</p> <p>Properties of hardened concrete Definition of compressive strength, durability, impermeability, elastic properties of concrete, modulus of elasticity of concrete. Creep, factors affecting creep, shrinkage, factors affecting shrinkage</p> <p><i>CONCRETE MIX DESIGN</i> Objectives of mix design, list of different method of mix design ,study of mix design procedure by I.S. method as per I.S. 10262-1982 ,determination of design mix proportion by mass for M 20 grade of concrete using I.S. Method for given data (such as grading zone of sand, proportion of 20 mm & 10 mm metals, specific gravities of cement, sand & aggregate , water absorption of sand & aggregate, compacting factor and exposure condition).</p> <p>Testing of concrete Significance of testing, determination of compressive strength of concrete cubes at different ages, interpretation & co-relation of test results</p> <p>Non- destructive testing of concrete Importance of NDT, methods of NDT - rebound hammer test & ultrasonic pulse velocity test, working principle of rebound hammer and factor affecting the rebound index, specification for deciding the quality of concrete by ultrasonic pulse velocity as per I.S. 13311 (part 1 & 2). Determination of rebound index & compressive strength of concrete by rebound hammer test as per I.S. 13311, determination of quality of concrete by ultrasonic pulse velocity test</p>	<p>12</p>	<p>15</p>
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Unit – 4	<p>Quality Control of Concrete: Batching, Different Types of Mixers & Vibrators Volume & weight batching, volume batching for nominal mixes & weight batching for design mix concrete, types of mixers (tilting & non-tilting type) Different types of vibrators - needle vibrator, surface vibrator, table vibrator, principle & application of each type of vibrator</p> <p>Formwork : formwork for concreting, different types of formworks for different works such as beams, slabs, columns, well foundation, materials used for formwork, requirement of good formwork, stripping time for the removal of formwork as per I.S. 456- 2000 provisions for different structural members.</p> <p>Transportation, placing, compaction & finishing of concrete: Modes of transportation of concrete , precautions to be taken during transportation and placing of concrete in formwork compaction of concrete, methods of compaction, care to be taken during compaction, purpose of finishing, types of finishing & methods of application (surface treatment, expose aggregate finish, applied finish, coloured finish), requirement of good finish.</p> <p>Curing of concrete : definition of curing, necessity of curing, different methods of curing and their application (spraying water, membrane curing, steam curing, curing by infra red radiations, curing by wet gunny bags, ponding methods).</p> <p>Waterproofing of concrete & joints in concrete construction: Importance & need of waterproofing, methods of waterproofing & materials used for waterproofing, types of joints, joining old & new concrete, methods of joining, materials used for filling joints.</p>	12	16
Unit – 5	<p>Extreme weather concreting & chemical Admixture in concrete : Extreme weather concreting Effect of cold weather on concrete, effect of hot weather on concrete, precautions to be taken while concreting in hot & cold weather condition.</p> <p>Chemical admixture in concrete Properties & application for different types of admixture such as accelerating admixtures, retarding admixtures, water reducing admixture, air entraining admixture & super plasticizers.</p>	05	07
Unit – 6	<p>Properties of Special Concrete: Properties, Advantages & Limitation of the following types of Special concrete</p> <ul style="list-style-type: none"> i) Ready mix Concrete ii) Reinforced Concrete iii) Prestressed Concrete iv) Fiber Reinforced Concrete v) Precast Concrete vi) High performance Concrete 	05	07
	Total	48	70

Text /Reference Books:-		
Titles of the Book	Name of Authors	Name of the Publisher
Concrete Technology	M. L. Gambhir	Tata Mc Graw . Hill Publishing Co. Ltd. New Delhi
Concrete technology	A. M. Neyille & JJ Brooks	Pearson Education (Singapore) Pvt. Ltd. New Delhi
Concrete technology	M. S. Shetty	S. Chand Publication
Text book of Concrete technology	P. D. Kulkarni	M. H. Ghosh and Phull publication
Chemical Admixtures for concrete	H.R. Rixom	Powells' Books
Concrete Technology	Gopalkrishnan	Foundation Publishing

WORKSHOP PRACTICE(CE106P)

Subject Code CE106P	Term Work			No of Period in one session :			Credits 02
	No. of Periods Per Week			Full Marks			
	L	T	P/S	ESE	:	50	
	-	—	04	Internal Exam.	:	15	
	—	—	—	External Exam.	:	35	

Details of Practical		Hrs/week
Unit -1	<p>CARPENTERY SHOP:</p> <ul style="list-style-type: none"> • Any one composite job from the following involving different joint, turning and planing, surface finishing by emery paper, varnishing etc. like square stool, tea table, center table, chaurang, table lamp bed sofa-set, book rack. Cabinet, notice board, shows cases, tables chairs etc. <p>Note:1] One job of standard size (Saleable article shall be preferred) 2] Batch size should be selected depending on volume of work. 3] Job allotted should comprise of 6-8 hours of actual working 4] Student shall calculate the cost of material and labor cost for their job from the drawing.</p>	
Unit -2	<p>WELDING SHOP</p> <ul style="list-style-type: none"> • Any one composite job from involving butt joint lap joint welding process, from the following like Grill, door, window frame, waste paper basket, Chappel stand, Corner flower stand chair , table frame (square pipe 25 mm) cooler frame (folding type) <p>Note: 1] One job of standard size (Saleable/marketable article shall be preferred) 2] Batch size should be selected depending on volume of work . 3] Job allotted should comprise of 6-8 hours of actual working operations. 4] Student shall calculate the cost of material and labor required for their job from the drawing.</p>	
Unit – 3	<p>SMITHY SHOP</p> <ul style="list-style-type: none"> • Demonstration of different forging tools and Power Hammer. • Demonstration of different forging processes, likes shaping, caulking fullering, setting down operations etc. • One job like hook peg, flat chisel or any hardware item. <ul style="list-style-type: none"> • Note: 1]One job of standard size (Saleable/marketable article shall be preferred) 2] Job allotted should comprise of 4-6 hours of actual working operations. 3] Student shall calculate the cost of material and labor required for their job from the drawing. 	
Unit – 4	<p>PLUMBING SHOP :</p> <ul style="list-style-type: none"> • Demonstration of PVC pipe joint with various fittings. • Exercise for students on preparing actual pipeline layout for G.I. Pipe or PVC pipe. Preparing actual drawing and bill of material. <p>Note:1] One job of standard size (Saleable/marketable article shall be preferred) 2] Batch size should be selected depending on volume of work. 3] Job allotted should comprise of 6-8 hours of actual working 4] Student shall calculate the cost of material and labor cost for their job from the drawing.</p>	

Unit – 5	<i>SHEET METAL SHOP</i> <ul style="list-style-type: none"> • One composite job from the following: Letter box, Trunk, Grain Container, Water-heater Container, Bucket, Waste Paper Basket, Cooler Tray, Water-draining Channel, etc. (including soldering and riveting) <p>Note: 1] One job of standard size (Saleable/marketable article shall be preferred) 2] Batch size should be selected depending on volume of work. 3] Job allotted should comprise of 4-6 hours of actual working ions. 4] Student shall calculate the cost of material and labor cost required for their job from the drawing.</p>	
Unit – 6	Demonstration of power tools and practice of utility items. <ul style="list-style-type: none"> • Demonstration of advance power tools, pneumatic tools, electrical wiring tools and accessories. • Making of electrical switchboard with 2 sockets and piano buttons and with electrical wiring. • Any other item as per the requirement of college/Deptt./ 	
	Total	64

BUILDING CONSTRUCTION LAB(CE107P)

Subject Code CE107P	Practical						Credits
	No. of Periods Per Week			Full Marks	:	50	01
	L	T	P/S	ESE	:	50	
	—	—	03	Internal	:	15	
	—	—	—	External	:	35	

CONTENTS: PRACTICAL

SKILLS TO BE DEVELOPED:-

1. INTELLECTUAL SKILLS:- STUDENTS WILL BE ABLE TO
 - A) IDENTIFY COMPONENTS OF A BUILDING.
 - B) DIFFERENTIATE AND IDENTIFY TYPES OF BUILDING MATERIALS.
 - C) SELECT APPROPRIATE MATERIAL FOR BUILDING CONSTRUCTION.
 - D) SUPERVISE THE BUILDING CONSTRUCTION ACTIVITIES.

2. MOTOR SKILLS :- STUDENTS WILL BE ABLE TO.
 - a) MARK LAYOUT OF BUILDING ON THE GROUND.
 - b) CHECK AND MARK VARIOUS LEVELS IN BUILDING.

LIST OF PRACTICALS:

1. PREPARING FOUNDATION PLAN AND MARKING ON GROUND LAYOUT OF LOAD BEARING STRUCTURE BY FACE LINE METHOD FROM THE GIVEN PLAN OF THE BUILDING.
2. PREPARING FOUNDATIONS PLAN AND MARKING ON GROUND LAYOUT OF FRAMED STRUCTURE BY FACE LINE METHOD FROM THE GIVEN PLAN OF THE BUILDING.
3. CHECKING AND TRANSFERRING LINE AND LEVEL OF PLINTH, SILL, LINTEL, FLOORING, SLAB LEVEL OF A BUILDING AND WRITING REPORT OF THE PROCESS.
4. CHECKING VERTICALITY (PLUMB LINE) OF FORMWORK FOR COLUMN, BEAM AND WALL AT CONSTRUCTION SITE AND WRITING REPORT OF THE PROCESS.
5. LAYING AND CONSTRUCTING THE PROCESS OF CONSTRUCTION OF BRICKWORK AND REPORT WRITING OF THE PROCESS.
6. OBSERVING THE PROCESS OF PAINTING IN RESIDENTIAL / PUBLIC BUILDING AND WRITING A REPORT WITH REFERENCE TO PROCESS AND TYPE OF PAINT SELECTED.
7. OBSERVING AND WRITING REPORT OF THE PROCESS OF PLASTERING.
8. OBSERVING AND WRITING REPORT OF THE PROCESS OF WATER PROOFING OF TERRACE OR BASEMENT.
9. OBSERVING THE MODELS, SPECIMEN OF BUILDING MATERIALS KEPT IN THE MODEL ROOM FOR FEW BUILDING ITEMS AND WRITING A REPORT FOR ANY FIVE MODELS/MATERIALS.

ENGG. GRAPHICS (CE108P)

Subject Code CE108P	Theory			No of Period in one session :			Credits 02
	No. of Periods Per Week			Full Marks			
	L	T	P/S	ESE			
	02	—	—	—			

Contents (Theory)		Hrs/week	Marks
Unit -1	Drawing Instruments and their uses : Letters and numbers (single stroke vertical) Convention of lines and their applications. Scale (reduced, enlarged & full size) plain scale and diagonal scale. Sheet layout . Introduction to CAD (Basic draw and modify Command). Geometrical constructions.	05	05
Unit -2	Engineering curves & Loci of Point: 1.2 To draw an ellipse by : Directrix and focus method Arcs of circle method. Concentric circles method. To draw a parabola by : Directrix and focus method Rectangle method To draw a hyperbola by : Directrix and focus method passing through given points with reference to asymptotes. Transverse Axis and focus method. To draw involutes of circle & polygon (up to hexagon) : To draw a cycloid, 21 picycloids, hypocycloid To draw Helix & spiral. Loci of Points: Loci of points with given conditions and examples related to simple mechanisms.	09	08
Unit – 3	Orthographic projections : Introduction to Orthographic projections. Conversion of pictorial view into Orthographic Views (First Angle Projection Method Only). Dimensioning technique as per SP-46.	06	06
Unit – 4	Isometric projection : Isometric scale. Conversion of orthographic views into isometric View/projection (Simple objects) Projection of Straight Lines and Planes. (First Angle Projection Method only).	05	05
Unit – 5	Lines inclined to one reference plane only and limited to both ends in one quadrant. Projection of simple planes of circular, square, rectangular, rhombus, pentagonal, and hexagonal, inclined to one reference plane and perpendicular to the other.	07	06
Total		32	30

Text/Reference Books:-

Titles of the Book	Name of Authors.	Name of the Publisher
(i) Engineering Drawing	N.D. Bhatta	Charotar Publishing House

(ii)	Engineering Drawing & Graphics +Auto CAD	K. Venugopal	New Age Publication
(iii)	Engineering Drawing	R.K. Dhawan	S. Chand Co.
(iv)	Engineering Drawing	P.J. Shah	-

BUILDING DRAWING –TW(CE109P)

Subject Code CE109P	Term Work						Credits
	No. of Periods Per Week			Full Marks	:	50	01
	L	T	P/S	Internal	:	15	
	—	—	02	External	:	35	

Contents : Term Work

Skills to be developed:

Intellectual Skills:

1. Read and interpret the building drawings
2. Plan residential and public buildings
3. Apply the building rules, regulations and byelaws.

Motor Skills:

1. Prepare line plans of Residential and Public Buildings
2. Prepare Detailed Plans, Elevations, Sections and other working drawings for the buildings.

S.No	Term Work / Assignments : Following exercises should be drawn on full imperial size drawing sheets.
1	<ul style="list-style-type: none"> • Drawing various types of lines, lettering and symbols of materials, doors and windows etc. used in construction on Full Imperial size drawing sheet.
2	<ul style="list-style-type: none"> • Drawing the lines plans of following buildings on Full Imperial size graph paper. • Residential Building (Min. three rooms) • Public Building – School building, Primary health center / Hospital building, Bank, Post Office, Hostel building etc.(At least four)
3	<ul style="list-style-type: none"> • Measured Drawing of an existing residential Building (Load bearing/ Framed structure Type) , showing Plan , Elevation, Sections, Construction notes, Schedule of openings, Site Plan, Area statement etc .
4	<ul style="list-style-type: none"> • Submission Drawing of two storied residential building (Framed structure type) showing Plans , Elevation, Sections, Foundation Plan ,construction notes, Schedule of openings, Site Plan ,Area statement etc.
5	<ul style="list-style-type: none"> • Working drawing of above drawing sheet preferably one plan, section through stair case to scale 1:50
6	<ul style="list-style-type: none"> • Two point perspective view of a building drawn in submission drawing.
7	<ul style="list-style-type: none"> • Tracing of a submission drawing prepared at Sr. No.4 above.
8	<ul style="list-style-type: none"> • Ammonia print of submission drawing prepared at Sr. No.4 above.

Green Building (CE110P)

Subject Code CE110P	Term Work					Credits 01	
	No. of Periods Per Week			Full Marks	:		25
	L	T	P/S	Internal	:		07
	—	—	02	External	:		18

UNIT I : INTRODUCTION [8 hours]

Life Cycle impacts of materials and products – sustainable design concepts – strategies of Design for the Environment -The sun-earth relationship and the energy balance on the earth’s surface, climate, wind – Solar radiation and solar temperature – Sun shading and solar radiation on surfaces – Energy impact on the shape and orientation of buildings – Thermal properties of building materials.

UNIT II : ENERGY EFFICIENT BUILDINGS [7 hours]

Passive cooling and day lighting – Active solar and photovoltaic- Building energy analysis methods- Building energy simulation- Building energy efficiency standards- Lighting system design- Lighting economics and aesthetics- Impacts of lighting efficiency – Energy audit and energy targeting- Technological options for energy management.

UNIT III : INDOOR ENVIRONMENTAL QUALITY MANAGEMENT [8 hours]

Psychrometry- Comfort conditions- Thermal comfort- Ventilation and air quality-Air conditioning requirement- Visual perception-Illumination requirement- Auditory requirement- Energy management options- -Air conditioning systems- Energy conservation in pumps- Fans and blowers- Refrigerating machines- Heat rejection equipment- Energy efficient motors- Insulation.

UNIT IV : GREEN BUILDING CONCEPTS [7 hours]

green building concept- Green building rating tools- Leeds and IGBC codes. – Material selection Embodied energy- Operating energy- Façade systems- Ventilation systems- Transportation- Water treatment systems- Water efficiency- Building economics

UNIT V : GREEN BUILDING DESIGN CASE STUDY [30 hours]

Students to work through a controlled process of analysis and design to produce drawings and models of their own personal green building project. Topics include building form, orientation and site considerations; conservation measures; energy modeling; heating system and fuel choices; renewable energy systems; material choices; and construction budget-Students will research green construction and design in a particular -construction context and report their results to the class.

[TOTAL (L:30+P:30): 60 PERIODS]

TEXTBOOKS:

- Kibert, C. “Sustainable Construction: Green Building Design and Delivery”, John Wiley & Sons, 2005
- Edward G Pita, “An Energy Approach- Air-conditioning Principles and Systems”, Pearson Education, 2003.

CONCRETE TECHNOLOGY –TW(CE112P)

Subject Code CE112P	Term Work			Credits		
	No. of Periods Per Week			Full Marks	:	25
	L	T	P/S	Internal	:	07
	—	—	02	External	:	18
						01

Contents : Term Work

Skill to be developed:

Intellectual Skills:

1. Analyze the given data
2. Select proper method for analysis
3. Interpret the results

Motor Skills:

1. Measure the quantities accurately
2. Handle instruments properly

Term work shall consist of eight experiments in part A & mini project work in Part B

Part A: PART A consists of GROUP I & GROUP II.

Group I– Physical tests on ordinary Portland cement (any four)

- 1) Determination of fineness of cement preferably by Blaine's air permeability apparatus or by sieving.
- 2) Determination of standard consistency of OPC
- 3) Determination of initial & final setting times of OPC.
- 4) Determination of compressive strength of ordinary portland cement
- 5) Determination of soundness of OPC.

Group II – Tests on fine & coarse aggregates (any four)

- 1) Determination of silt content in sand by volume / weight
- 2) Determination of maximum % of bulking of sand
- 3) Determination of aggregate impact value.
- 4) Determination of aggregate abrasion value.
- 5) Determination of aggregate crushing value.
- 6) Determination of bulk density & water absorption, fine & coarse aggregated.

Part B:

Mini Project :

Comparative study of compressive strength of concrete for different Water cement ratio With and without curing.

Note: video cassettes or cd's of above experiments developed by NITTTR (if available) shall be shown to the students on T. V. / L.C.D. projector prior to the conductance of above experiments.