Course Name: Diploma in Civil Engineering
Course Code : DCE
Semester : Fourth
Subject Title : Advanced Surveying
Subject Code : 131CE41

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	4	3	80	32	20	100	40	50	20	-	-	25	10	175

Practical Examination will be assessed by internal & external examiner.

Rationale:

The elementary knowledge of survey will be dealt with in the course 131CE41, where as in this course the knowledge and use of the advance and precise survey equipment like Total station, EDM & GPS etc. will be given. Some very quick precise and appropriate methods and technology for conducting survey in odd terrains are covered.

Objective:
Students will be able to:

- Find out horizontal and vertical distances with tacheometer
- Set out simple curve by using theodolite.
- Record the data in field book and plot the collected data.
- Use of Modern Survey equipments.
- Apply principles of surveying and levelling for Civil Engineering works.

Part I -Theory:

Sr.No.	Contents	L	M
	Section I		
1	Theodolite traversing: 1.1 Method of traversing: Included angle method, Deflection angle method and Fast needle method. 1.2 Traverse Computation: Consecutive co-ordinates and Independent co-ordinates. 1.3 Balancing of traverse-: Bowditch's rule, Transit rule and Axis method. 1.4 Gale's traverse table 1.5 Omitted measurement. 1.6 Permanent adjustment of theodolite.	06	10
2	Tacheometric levelling : 2.1 Introduction: Basic principles stadia of techeometry.	09	15

	2.2 Determination of tacheometer constant : Lab measurement and field measurement 2.3 Anallatic lens: Objective and theory 2.4 Methods of techeometry: fixed hair, movable hair and tangential method, substance bar 2.5 Determination of Tacheometric measurement: distance and elevation formulae for vertical holding of levelling staff.		
3	Setting out of curves and civil works : 3.1 Introduction: Definition, necessity of curve. 3.2 Types of curves: Horizontal & Vertical curves 3.3 Elements of simple circular curve 3.4 Methods of setting out simple circular curve: Linear and Instrumental method (two theodolites and Rankin's deflection angle method). 3.5 Setting out a building (Load bearing and R.C.C structure)	09	15
	Total of Section I	**24**	**40**
	Section II		
4	Modern surveying instruments: 4.1 Introduction of electronics in surveying: General principles used in the instruments. 4.2 Auto levels, self compensating instrument, Digital Level. 4.3 Electronic distance measurements (EDM): Principle, Components and use. 4.4 Electronic digital theodolite: construction and use. 4.5 Concept of Total station: construction and use.	09	15
5	Remote sensing : 5.1 Introduction 5.2 Basic principles of remote sensing system. 5.3 Electromagnetic energy and Electromagnetic spectrum. 5.4 Remote sensing system- passive and active system. 5.5 Application of remote sensing to civil engineering	06	10
6	Global Positioning System (G.P.S) : 6.1 Introduction 6.2 G.P.S. Segments: spaces segment, control segment and user Segment. 6.3 Features of G.P.S. Satellites and Principle of Operation, Surveying with G.P.S. 6.4 Methods of observations: absolute positioning, relative positioning, and differential G.P.S. 6.5 Types of G.P.S. Receivers: navigational receivers, surveying receivers and geodetic receivers, 6.6 Applications of G.P.S.	09	15

	Total of Section II	**24**	**40**
	Total of Section I & II	**48**	**80**

Practicals:

List of Practicals:

1. To determine the tacheometric constant of the given tacheometer
2. Tacheometric practice
3. To find the gradient of a line joining two points.
4. Setting out of simple curve by (linear and angular method)
5. Setting out a building (Load bearing and R.C.C structure)
6. Study of Digital theodolite : measurement of horizontal angle and vertical angle
7. Determination of horizontal, sloping and vertical distance between any two points by using Total Station. (Practice)
8. Mapping by Total Station
9. Collection of field data like point data, line data and area data by using surveying and mapping GPS receiver

List of Projects:

1. A Two days project on Theodolite traversing and plane table detailing
2. Block contouring – 1 day
3. Tacheometric contouring – 1 day

Term Work:

Term work shall consist of record of all practicals and projects in field book and drawing of project work on full imperial drawing sheets.

Learning Resources:

Text Books

Surveying and Leveling by N.N.Basak, Publisher: Tata McGraw Hill 25 th Edition 2008.

Reference Books:

Surveying and Leveling Vol. II & III by B. C. Punmia, Publisher: Laxmi Publication, 16th edition, 2005.

Course Name : Diploma in Civil Engineering
Course Code : DCE
Semester : Fourth
Subject Title : Hydraulics
Subject Code : 131CE42

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	3	80	32	20	100	40	-	-	-	-	25	10	125

Rationale:
Hydro means water and Hydraulics is a branch of engineering science deals with behavior of fluids at rest as well as in motion.

While constructing any of the hydraulic structures like dam, construction of canals and hydroelectric power station, design of water supply system, etc; a Civil Engineer must have the knowledge about the properties of fluids, water pressure, types of flows and different hydraulics machine.

Objective:
Students will be able to

- Know about the properties of fluid and the principle of pressure measuring devices.
- Compute the total hydro static pressure & center of pressure.
- Identify the concept of fluid flow, types of flow and water pressure.
- Compute the loss of water flowing through pipes required to consider while designing water supply system
- Know about the hydraulic machine like centrifugal pump, turbines, etc.

Sr.No.	Topic	L	M
	Section I		
01	Properties Of Fluid 1.1 Definition of fluid, Introduction to fluid mechanics and hydraulics, Importance of Hydraulics with respect to Irrigation and Environmental engineering. 1.2 Physical properties of fluid - Mass density, Weight density, Specific volume, Specific gravity, Surface tension and capillarity, Compressibility, Viscosity.	3	07
02	Pressure and its measurement 2.1 Definition of pressure and its SI unit, Hydrostatic pressure at point- Pascal's law, Variation of pressure in static liquid. Numerical problems.	11	15

	2.2 Total pressure and center of pressure, vertical plain surface submerged in liquids, and Horizontal plain surface submerged in liquid, Inclined plain surface submerged in liquid. Numerical problems. 2.3 Absolute, gauge, atmospheric & vacuum pressure, measurement of pressure-manometers and mechanical gauges. Numerical on Piezometer and U tube manometer.		
03	Fundamentals Of Fluid Flow 3.1 Concept of flow, Gravity flow and pressure flow. Types of flow – steady and Unsteady, uniform and non-uniform, Laminar and turbulent. Reynolds number and its application, 3.2 Discharge and its units Continuity equation for fluid flow. Datum head, pressure head, velocity head and total head, Bernoulli's theorem, Impulse momentum theorem. Numerical Problems. 3.3 Venturimeter, orifice meter, nozzle meter, Classification of orifices, Flow through an orifice, Hydraulic coefficients: coefficient of velocity, coefficient of contraction, coefficient of discharge, classification of mouthpieces. Numerical Problems.	10	18
	Total of section I	**24**	**40**
	Section II		
04	Flow through pipes: 4.1 Loss of energy in pipes- major losses due to friction by Darcy Weisbach formula and Chezy's formula, minor energy losses due to sudden enlargement, sudden contraction, at the entrance of a pipe, at the exit of a pipe, due to bend in pipe, due to obstruction in a pipe and Loss of head in various pipe fittings. Numerical Problems. 4.2 Hydraulics gradient & total energy line, flow through pipes in series, equivalent pipe, flow through parallel pipes, flow through branched pipes. Numerical Problems.	9	15
05	Flow in open channels 5.1 Classification of flow in channels- steady & unsteady flow, uniform & non uniform flow, laminar & turbulent flow, sub-critical , critical & supercritical flow. 5.2 Discharge through open channel by Chezy's formula, most economical rectangular channel section. Numerical Problems. 5.3 Classification of notches & weirs, discharge over rectangular notch or weir, discharge over triangular notch or weir. Numerical Problems.	8	15

06	Hydraulic Machines 6.1 Pumps- Definition and types, Suction head, delivery head, static head and manometric head. Centrifugal pump - component parts and their functions, efficiencies of a centrifugal pump, minimum speed for starting of a centrifugal pump, priming. 6.2 Turbines- Turbines, general layout of hydro electric power plant, classification of hydraulic turbine	07	10
	Total of section II	**24**	**40**
	Total of section I & II	**48**	**80**

Practicals –: Any Eight Experiments

1) To study the Hydrostatics Law
2) Verification of Bernoulli's equation
3) Determination of coefficient of discharge for a given Venturimeter.
4) Determination of coefficient of discharge for a given Orificemeter or Nozzle meter.
5) Determination of Darcy's friction factor for a given pipe
6) Determination of Minor losses in pipes (any two)
7) Determination of Manning's constant or Chezy's constant for given rectangular channel section.
8) Determination of coefficient of discharge for given rectangular or triangular notch.
9) Study of a model of centrifugal pump.

Term Work -
Students shall submit practical journal explaining procedure with observations & calculations of above experiments

Text Books:

1. A Text Book of Fluids Mechanics & Hydraulics by R. K. Rajput, Edition 2nd reprint 2004 Publisher S. Chand & Company Ltd. New Delhi
2. Hydraulics & Fluids by Dr. P. N. Modi & Dr. S. M. Seth, Edition 17th 2009, Publisher- Standard Book House, New Delhi.

Reference Books:

1. Fluid Mechanics and Hydraulic Machines by Dr. R .K. Bansal, Edition 9th 2005 Publisher- Laxmi Publications Pvt. Ltd., New Delhi.
2. Hydraulics Laboratory Manual by S. K. Likhi. Publisher- T.T.T.I. Chandhigrah.

Course Name : Diploma in Civil Engineering
Course Code : DCE
Semester : Fourth
Subject Title : Road & Bridge Engineering
Subject Code : 131CE43

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
				Theory		Test	Total		Practical		Oral		Term work		
L	T	P		Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	3	80	32	20	100	40	-	-	-	-	25	10	125

Rationale

Road is basic mode of transportation in India. It is easy & effective mode of transportation. Study of Highway Engineering will give knowledge and skills required to carry investigation, planning, design, construction, maintenance work related to roads & bridges. Diploma Civil engineering student can work as a technician, supervisor for roads and bridge construction and repairs. He can take the road construction work on contract basis.

Objective

At the end of this course student will be able to

- Survey and investigation for new road site.
- Organize, supervise and co-ordinate construction activities of road.
- Test the materials required on site and laboratory.
- Repair, maintain, and improve the existing road.
- Understand the types of bridges, their component parts and their maintenance.

Sr. No.	Contents	L	M
	Section I		
1	Roads: 1.1 Various modes of transportation, Necessity and benefits of roads. 1.2 Classification of roads-location, function, material, traffic. 1.3 Alignment fixing of road, factors affecting alignment.	02	05
2	Geometric design of Highways: Highway cross sectional elements 2.1 Camber-definition, purpose, types, IRC specifications. 2.2 Kerbs, road margin, road formation, right of way, Shoulders. 2.3 Design speed-IRC specification. 2.4 Gradient-definition, types, IRC specification. 2.5 Sight distances-definition, types, IRC specification. 2.6 Widening of roads on curves. 2.7 Super elevation-definition, formula for calculating super elevation, minimum and maximum values of super elevation and methods of providing super elevation.	08	10

	2.8 Typical road cross sections in embankment and cutting. 2.9 Problems based on geometric design of road.		
3	Road materials: 3.1 Materials-soil, aggregates, cement and bitumen. 3.2 Tests-C.B.R. test on soil sub grade. 3.3 Tests on aggregates-abrasion, impact and shape test. 3.4 Tests on bitumen-Penetration, Ductility, Softening point test, Viscosity test.	04	10
4	Types of pavement: 4.1 Flexible and rigid, pavement components and their functions. 4.2 Pavement design factors.	03	05
5	Construction: 5.1 Detailed construction procedure of W.B.M. road. 5.2 Detailed construction procedure of bituminous roads. Bituminous surface types-prime, tack and seal coat, Surface dressing. 5.3 Detailed construction procedure of cement concrete roads, equipments required, construction joints, joint filter, joint sealer.	07	10
	Total of Section I	**24**	**40**
	Section II		
6	Drainage & maintenance of road: 6.1 Significance and requirements of highway drainage system. 6.2 Methods of surface and subsurface drainage system. 6.3 Necessity of maintenance of roads, ordinary, routine and periodic maintenance. 6.4 Strengthening of existing pavement, object of strengthening, types of overlays and its design.	06	10
7	Traffic Engineering: 7.1 Traffic volume study. 7.2 Speed study, traffic capacity, PCU. 7.3 Traffic control devices-Road signs, marking, signals, traffic islands. 7.4 Road intersections-intersections at grade and grade separator intersections. 7.5 Road accidents-collision & condition diagram, measures for accident prevention. 7.6 Street lighting-Needs, definition, laws of illumination, types of lamps, planning and designing.	10	15
8	Bridges: 8.1 Definition of bridge. 8.2 Components of bridge-Superstructure & substructure. 8.3 Economic span of bridge, linear water way, afflux, discharge calculations & flood discharge, Catchment area, Scour depth. 8.4 Selection of a bridge site. 8.5 Various types of bridges, characteristics, suitability. 8.6 Culverts, types of culverts.	08	15
	Total of Section II	**24**	**40**
	Total of Section I & II	**48**	**80**

Practicals:

A) Test on Aggregates

1. Abrasion value.
2. Impact value.
3. Crushing strength.
4. Shape test.
5. Specific gravity.
6. Water Absorption.
7. Cleanliness test.
8. Soundness test.
9. Stripping test.

B) Test on Bitumen

1. Penetration.
2. Softening Point.
3. Ductility.
4. Viscosity.
5. Flash & Fire Point.

Term Work

I) Student shall submit journal of minimum 10 practicals
II) 5-6 assignments based on syllabus.
III) Visit to Road & Bridge Construction Site.

Learning Resources

Text Books:

1. Highway Engineering by Khanna & Justo, Khanna Publication.2005
2. Principles & Practices of Bridge Engineering by S.P.Bindra, Dhanpat Rai Publications 1999
3. Highway Material Testing (Laboratory Manual) by Khanna & Justo, Khanna Publication.2009

Reference Books:

1. A Text Book of Transportation Engineering by S.P. Chandola, S. Chand and company.2001
2. Principles and Practice of Highway Engineering by L.R. Kadiyali, Khanna Tech Publications.1989
3. Bridge Engineering by Ponnuswamy S., Tata McGraw Hill,2008

IS codes:

IS 2386 part III & IV, IS 6241, IS 1202, IS 1203, IS 1205, IS 1206, IS 1209

Course Name : Diploma in Civil Engineering
Course Code : DCE
Semester : Fourth.
Subject Title : Concrete Technology
Subject Code : 131SE44

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Term work		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	3	80	32	20	100	40	-	-	-	-	25	10	125

Rationale:
Diploma holders in Civil Engineering are supposed to supervise concreting operations involving, proportioning, mixing, transporting, placing, compacting, finishing and curing of concrete. To perform above functions, it is essential to impart knowledge and skills regarding ingredients of concrete and their properties; water cement ratio and workability; proportioning for ordinary concrete; mixing, compacting and curing of concrete and identification of defects.

Objective:
Concrete is the most versatile material of construction, simple to make but most complex to understand. The cement and concrete industry is witnessing a very rapid development day to day and hence the aim of this course is to impart a professional / practical knowledge about advanced concrete technology by understanding concrete right from its chemistry, making, placing to testing of hardened concrete. At the end of the course, the students are expected to:

- Have an overall understanding of the behavior of concrete.
- Understand basic chemistry of Cement, Fly ash, Plasticizer, Retarder, etc.
- Hands on experience of designing concrete mix as per IS code guidelines.

The study will be supplemented by intensive tutorials, laboratory work, ensuring active participation of students.

Sr.No.	Contents	L	M
	Section I		
1	Introduction:		20
	1.1 Definition of Concrete, Advantages of concrete	02	
	1.2 Cement, composition of cement, types of cement, tests on cement, setting time, fineness, strength of cement.	04	
	1.3 Aggregates, classification, strength of aggregate, bulking of sand, sieve analysis, Quarry selection, Water Quality Requirements as per I.S 456-2000	06	
2	Properties of Concrete:		20

	2.1Workability: Factors affecting Workability, Measurement of workability, slump test, compacting factor, Recommended slumps for placements in various conditions as per I.S 456-2000.	06	
	2.2 Bleeding of Concrete, Water Cement ratio, Shrinkage, Creep, Durability of Concrete	03	
	2.3Test on Concrete: Compression Test, Cube test, Cylinder Test	03	
	Total of section I	**24**	**40**
	Section II		
3	Mix design: Objectives of mix design, mean strength, Introduction to various grades as per I.S 456-2000, proportioning for normal mix as per I.S. methods.	06	8
4	Special types of concrete: Ready mix concrete, precast concrete, vacuum concrete, shotcrete, lightweight concrete, high performance concrete.	06	8
5	Admixtures as per I.S 456-2000: Chemical Admixtures such as Plasticizers, Retarders, Accelerators, Water Reducing admixtures, Additives used in RMC.	04	8
6	Mixing and Compaction of Concrete: Hand Mixing and Machine Mixing, Hand Compaction and Machine Compaction.	03	8
7	Curing of Concrete: Objectives and methods of Curing; Duration of curing and removal of formwork.	03	04
8	Defects in Concrete: Identification and methods of repairs	02	04
	Total of section II	**24**	**40**
	Total of Section I & II	**48**	**80**

List of Experiments:

Sr.No.	Name of Experiments.
1.	Determination of water for cement paste of normal Consisitency.
2.	Determination of Initial and Final Setting time.
3.	Verification of Soundness of cement
4	Determination fineness of cement by sieving
5	Determination of compressive strength of cement.
6	Determination of FM of fine and coarse aggregate.
7	Test on Workability of concrete: Slump cone test: Effect of W/C and A/C on slump.
8	Test on workability : Compaction factor test
9	Compressive test on concrete by cube and cylinder
10	Flexure test on concrete
11.	To determine proportion of Ingredients for design Mix.

Term Work:
Students shall submit journal for above listed (Any 10) experiments.

Text Books:

1. Cement Concrete Mix Design Principles and practice by M.Y. Sabnis, edition-2005,GMS Publications.
2. Concrete Technology by M.S. Shetty, edition 2008,S.Chand Publication.

Reference Books:

Properties of Concrete by A.M. Neville, 4th edition, 1996, publisher John Wiley & Sons.

Course Name : Diploma in Civil Engineering
Course Code : DCE
Semester : Fourth
Subject Title : Heat, Ventilation and Air Conditioning (HVAC)
Subject Code : 131CE45

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Term work		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	1		3	80	32	20	100	40	-	-	-	-	25	10	125

Rationale:

Heat, Ventilation, and Air conditioning (HVAC) is the technology of indoor environmental comfort. HVAC system design is a sub discipline of mechanical engineering, based on the principles of thermodynamics, fluid mechanics, and heat transfer.

The functions of heating, ventilating, and air-conditioning are interrelated, especially with the need to provide thermal comfort and acceptable indoor air quality within reasonable installation, operation, and maintenance costs. HVAC systems can provide ventilation, reduce air infiltration, and maintain pressure relationships between spaces.

HVAC is important in the design of medium to large industrial and office buildings such as skyscrapers, where safe and healthy building conditions are regulated with respect to temperature and humidity, using fresh air from outdoors. Basic knowledge of HVAC systems is therefore essential for all the Civil Engineers.

This subject contains the study of basics of HVAC systems, air conditioning and its applications.

Objectives:

- To understand the importance of ventilation, humidity and natural light in the design of buildings.
- To study airconditioning systems.
- Study of various components, devices used in refrigeration, air conditioning and ventilation systems.
- To esimate heat load.
- To study ventilation system in kitches, toilets & car parking.

Sr.No.	Contents	L	M
	Section I		
1	Ventilation : 1.1 Necessity of ventilation, 1.2 factors affecting ventilation - Humidity,quality of air,effective temperature(DBT,	3	4

	WBT) air changes, use of building. 1.3 Limits of comfort (heat tolerance). 1.4 Essentials of good ventilating system.		
2	Ventilation Systems: 2.1 Natural ventilation. 2.1.1 Rate of ventilation due to wind action 2.1.2 Rate of ventilation due to stack effect. 2.2 Mechanical or artificial ventilation – Methods 2.2.1 Extract or exhaust 2.2.2 Supply or Plenum 2.2.3 Balancing system 2.2.4 Air conditioning. 2.3 Lighting & ventilation requirements of various rooms. 2.3.1 Study of kitchen exhaust system, toilet exhaust System, car parking ventilation system.	7	14
3	Air Conditioning: 3.1 Defination & objects of air conditioning. 3.2 Classification of air conditioning 3.2.1 Comfort air conditioning 3.2.2 Industrial air conditioning 3.2.3 Summer air conditioning 3.2.4 Winter air conditioning 3.2.5 Composite air conditioning 3.3 Principles of air conditioning- temperature control, air velocity, humidity control. 3.4 Essentials / Components involved in air conditioning system – 3.4.1 Filters 3.4.2 Heating 3.4.3 Cooling 3.4.4 Humidification 3.4.5 Dehumidification 3.4.6 Air distribution 3.4.7 Recirculation 3.5 Indoor air quality 3.6 Human comfort.	10	15
4	Systems of air conditioning : 4.1 Types of air conditioning systems 4.1.1 Central air conditioning systems or plant DX sytem, chilled water system, Layout of DX & chilled water air conditioning sytem & comparison. 4.1.2 Unitary central air conditioning system 4.1.3 Unitary air conditioning system 4.2 Packaged air conditioners 4.3 Room air conditioners & its installation 4.4 Split air conditioners.	4	7

	4.5 Dehumidifiers.		
	Total of section I	**24**	**40**
	Section II		
5	Air Distribution Systems : 5.1 Points to be considered for air distribution. 5.2 Fans – Classification ClassI, Class II & Class III. 5.3 Air handling units 5.4 Constant &variable(CAV &VAV) air volume system. 5.5 Air Filtration, filter types 5.5.1 Prefilters- sieve or screen filters. 5.5.2 Absolute or High efficiency particulate air filters. 5.5.3 Electronic filters 5.6 Fitting & maintenance of filters.	5	10
6	Ducts : 6.1 Function of duct 6.2 Duct fabrication & insulation.	2	4
7	Heat load estimation: 8.1 Objective of heat load estimation. 8.2 Heat gain through glass (conduction, radiation) 8.3 Heat gain through wall 8.4 Heat gain through roof 8.5 Heat gain through partition, ceiling, floor 8.6 Heat gain through ventilation 8.7 Heat gain through infiltration 8.8 Heat gain through people 8.9 Heat gain through lighting 8.10 Heat gain through appliances 8.11 Sensible and Latent Heat Load 8.12 Simple Problems on Heat Load estimation and air conditioning by using Psychromtric charts	8	8
8	Applications: 8.1 Factors to be considered while selecting an air conditioner for a room. 8.2 Steps followed while installing a new window air conditioner. 8.3 Steps followed while installling a packed unit. 8.4 Common capacities of packaged units. 8.5 Maintaenance of packaged units.	2	4
9	Solar energy for Green / Modern buildings: 9.1 Principle of conversion of solar energy into heat and electricity. 9.2 Solar radiation, solar radiations at earth's surface. 9.3 Solar radiation geometry – declination, hour angle, altitude angle, incident angle, zenith angle, solar azimuth angle. 9.4 Construction and Woking of typical flat plate collector.	7	14

	9.5 Solar concentrating collectors and their applications, advantages and limitations. 9.6 Applications of solar energy- space heating and cooling, photovoltaic energy conversion, solar distillation, solar cooking and furnace, solar pumping and green house, agriculture and industrial process heat.		
	Total of Section II	**24**	**40**
	Total of Section I & II	**48**	**80**

Term Work:

1. Study of window A/C, split A/C.
2. Study of Psychrometric properties of air.
3. Study of ducting, piping layouts in centralized air conditioning plants.
4. Five assignments based on above topics.

Text Books:

1. Refrigeration & Air conditioning – R.S. Khurmi, J.K. Gupta, 5th Edition, S. Chand Publications.
2. Non conventional energy resources by Dr B.H. Khan published by Tata McGraw Hill

References Books:

1. Principles of Refrigeration - Roy J. Dossat-Pearson Education-4th edition-2005
2. Refrigeration & Air conditioning - Manohar Prasad, New Age Publishers,2nd Edition-2005
3. Air Conditioning Principle and Systems- Edward G.Pita, Prentice Hall India Publications, 4th Edition- 2002
4. Basic Refrigeration and Air Conditioning- Ananthnarayanan- Tata McGraw Hill Publications- 2nd Edition- 2000
5. HVAC trouble shooting Guide- Rix Miller-McGraw Hill- 2009.
6. Non conventional energy resources by G.D. Rai published by Khanna publishers.

Visits

1. Visit to cold storage/central air conditioning/packaged unit installation.
2. One field visit to be conducted to demonstrate application of solar energy.
3. Students to collect information about Indian energy market.

Course Name: Diploma in Civil Engineering
Course Code : DCE
Semester : Fourth
Subject Title : Computer Aided Drawing
Subject Code : 131CE46

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	-	-	-	-	-	-	50	20	-	-	50	20	100

Practical Examination will be assessed by internal & external examiner.

Rationale:
No sphere of human life is left untouched by computers. Computer has drastically changed the conventional learning process. Today, the architects & Civil Engineers are able to prepare precise drawings within couple of minutes only because of computers & the various drafting software. Design software save time & energy & give accurate results. In view of this computer aided drawing has been included in the curriculum.

Objective: At the end of this course students will be able to:

- Know about various design software available & their applications to the industry.
- Understand the usage of different CAD commands for drawing.
- Prepare line plans with CAD software.
- Prepare submission drawing/working drawing for the buildings with CAD software.
- Prepare drawings of various civil engineering structures

Theory to be covered for practicals:

Sr. No.	Contents
1	CAD Software : 1.1 Definition, Usage & Application to the Industry, Merits & Demerits. 1.2 Various drawing software available in market: AutoCAD, ZwCAD, Felix Cad, Auto Civil, 3D Max etc. 1.3 Starting up with AutoCAD, Introduction of the user interface (Tool Bars, Drop down menus, Command line), Opening & Saving of a CAD file at the desired location.
2	CAD Commands : 2.1 WCS icon, UCS icon, co-ordinates, drawing limits, introduction to various modes like grid, snap ortho, polar.etc. 2.2 Drawing commands: line, polyline, multiline, circle, rectangle, ellipse, polygon etc. 2.3 Editing commands: Copy, move, offset, fillet, chamfer, trim, lengthen, mirror, rotate, array etc 2.4 Working with hatches, fills, various types of dimensioning, text, match properties etc.

3	Preparation of Drawings : 3.1 Generation of a line plan 3.2 Drawing a detailed Plan, elevation, section for a residential bungalow along with site plan, Area statement & Name plate. 3.3 Drawing a detailed Plan, elevation, section for any public/commercial building along with site plan, Area statement & Name plate. 3.4 Generation of 3D view and Printing an CAD drawing at various scales. 3.5 Introduction to other drafting software like Auto Civil, 3D Max.etc.

Practicals:

List of Practicals:

1. Introduction of the user interface, Usage of various CAD commands.
2. Building Drawing:
   2.1 Preparation of line plan for residential building.
   2.2 Drafting following drawing for a residential bungalow
      i) Detailed Plan
      ii) Elevation
      iii) Section
      iv) Site Plan
      v) Area statement & Schedules.
      vi) Title block.
   2.3 Drafting following drawing for a G+2 residential building
      i) Detailed Plan
      ii) Elevation
      iii) Section (2Nos)
      iv) Site Plan
      v) Area statement & Schedules
      vi) Title block
3. Drawing of Civil Engineering Structures
   3.1 Bonds in brick work- Plan & Elevation for English & Flemish bond)
   3.2 Plan, Cross section & longitudinal section of a Culvert (Pipe/ Box Culvert) or a Concrete bridge

Term Work:

Students should submit the file folder containing the print outs of all the above mentioned drawings.

Learning Resources:

Text Books:

AutoCAD2009 –A problem solving approach (AutoDesk press)

Web sites:

1. www.cadlearning.com
2. www.cadlearning.com
3. www.cadopolis.com/autocad-tutor.html

Course Name : Diploma in Civil Engineering
Course Code : DCE
Semester : Fourth
Subject Title : Professional Practices
Subject Code : 131CE47

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Term work		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	-	-	-	-	-	-	-	-	-	-	25	10	25

Rationale: There is growing understanding that to be competitive at any level, Civil Engineers not only build their traditional strength in technology and science but also must acquire great mastery of business of Civil Engineering. Project Management, Team work, Ethics, Leadership and Communication have been defined essential to the successful practice of Civil Engineer by American Society of Civil Engineer (ASCE) in 2008 landmark publication. This course is integrated into task which include three activities

- Mentoring Programme so as to get opportunity to student to interact with Practicing Engineer
- Leadership Exercise
- Communication Skills.

Objective: This subject will develop student as an effective member of team, developing ability and skill to perform at highest degree of quality as an individual as well as a member of core group or team. At the end of this course students will be able to

- Assimilate Information
- Developing working in team and handling people effectively
- Apply problem solving skill and task management for given projects

Sr.No.	Chapters	L
01	Introduction • Responsibility and Relationship of Customer and Service Provider (Contractors, Subcontractor, Consultant and Suppliers) as Per National Code of Practice for Construction Industry. • Engineering as a Profession- Ethics, defination of ethics. • Commitment to continuous Improvement • Case study on Customer requirement, Civil Engineers commitment and Client satisfaction. • Awareness regarding Sustainable Construction • Impact of Unethical Conduct • Method of writing technical report	5
02	Assimilation of Information • Industry visit or Information through internet, books, journals of manufacturing process of any type of following building material and submitting report in the form of termwork -	4

	Bricks, Timber, Steel, Precast member, Cement, Fibre Reinforced Plastic, moulded stone, Flooring tiles, Roofing material, Bitumen or any advanced building material.	
03	Mentoring Programme • Social Work project regarding awareness of conservation of environment, Hygiene in rural or urban areas. • Each field report to be submitted at the end of month and checked by concerned instructor, need to be submitted as Termwork	12
04	Leadership Exercise and Communication Skill • Task to be assigned to assess technical and handskill, leadership quality, collaborative work planning by giving any one of the below mentioned programme to group of 10students. 1. Use of any one surveying instrument in field. 2. Laying of bricks in English bond. 3. Planning of Public building such as School, Hospital College Canteen, and Library. 4. Market survey. • Assessment of above task to be done in the form of group discussion between groups of students.	7
05	Expert Lecture on topic related to (any three) • Transportation Engineering • Pollution Control • Best Practice adopted in Civil Engineering Construction. • Use of RMC in construction. • Specific Civil Engineering Application • Use of lift and escalator in High Rise building • Building byelaws for municipal areas. • New Building materials • Safety Engineering • Rain Water Harvesting	4
	Total	**32**

Term work:

Students shall submit report / termwork journal based on above topic.

Course Name : Diploma in Civil Engineering
Course Code : -
Semester : sem I to VI
Subject Title : Student Centered Activity/Test

Teaching & Examination Scheme

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		PR		OR		TW		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-

Rationale:

A fresh student needs lot of help about institute and its working. During the subsequent years there is a need of general development of personality, in addition to educational progress. During later part of course, a student needs to prepare for future career. Due to globalization and competition in the industrial and service sectors; the selection for the job is based on campus interviews or competitive tests. While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing 'Student Centered Activity (SCA)' is to provide opportunity to students to undergo activities which will enable them to develop confidence on various fronts as stated above.
Following activities can be planned in the form of lectures, notes, presentations and group visits etc:

1. Introduction to institute and related activities –
    a. Introduction to institute infrastructure and facilities
    b. General conduct and discipline
    c. Anti-ragging act
    d. functions of student counseling cell
    e. medical help center
    f. library procedures
    g. NCC activity
    h. Gymkhana activities
    i. cultural events
    j. scholarship issues
    k. hostel and mess functions
    l. railway concession
    m. academic calendar
    n. registration process
    o. examination rules
    p. malpractices in exams and punishments

2. Expert lectures on
    a. Introduction to E-learning sources
    b. Use of E-library
    c. Use of internet for career and personality development
    d. Preparations for seminars on technical topics
    e. Group discussion techniques
    f. General mannerisms and personality development
    g. Interview techniques
    h. Career guidance and related counseling.
    i. Health, yoga and mediation

These activities are planned in different semester so that there will be increased participation of students in learning process.
SCA will exist till the start of Monday Tests ie till first 8 weeks.

Objectives:

The Student will be able to:

1. Acquire information from different sources
2. Prepare notes for given topic
3. Present given topic in a seminar
4. Interact with peers to share thoughts
5. Take the advantages of E-learning sources

Procedure:

Students will be taken in groups to various places with instructors. Will be attending expert lectures as and when planned. View slide shows, get information through handout and notes, refer notices etc