

Course Name : Diploma in Civil Engineering

Course Code : DCE

Semester : Third

Subject Title : Mathematics III

Subject Code : 131MA31e

### 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	1	-	3	80	32	20	100	40	-	-	-	-	25	10	125

#### Rationale:

The study of mathematics is necessary to develop the skills essential for solving engineering problems. Integral calculus is routinely needed by engineers in calculations. Statistics is a widely used subject applicable to all fields of engineering in order to analyze data and derive meaningful inferences.

#### Objective:

- To make students well versed in various methods of integration for solving problems.
- To introduce students to various numerical methods.
- To expose students to techniques of solving differential equations.
- To introduce students to statistics.

Sr. No.	Contents	L	M
<b>Section-I</b>			
1	Integration 1.1 Definition of integration. Integration of standard functions. 1.2 Theorems of integration. 1.3 Methods of Integration 1.3.1 Integration by substitution 1.3.2 Integration of rational functions. 1.3.3 Integration by partial fractions. 1.3.4 Integration by parts. 1.4 Definite Integration 1.4.1 Definition of definite integral. 1.4.2 Properties of definite integral with simple problems.	19	28
2	Numerical Methods- Solution of algebraic equations 2.1 Bisection method 2.2 Regula-falsi method 2.3 Newton –Raphson method	06	12

<b>Section-II</b>			
3	Differential Equations: 3.1 Order and degree of the differential equation. 3.2 Solution of differential equation of first order, first degree. 3.2.1 Variable separable method. 3.2.2 Homogeneous differential equation. 3.2.3 Exact differential equation. 3.2.4 Linear differential equation.	08	16
4	Statistics: 4.1 Mean, Standard Deviation, Variance, Coefficient of variation for raw and classified data. 4.2 Probability 4.2.1 Sample space and events. 4.2.2 Concept of probability. 4.2.3 Conditional probability and independence. 4.2.4 Addition theorem, multiplication theorem,	15	24
<b>Total of Section I &amp; II</b>		<b>48</b>	<b>80</b>

**Reference Books:**

- 1) Applied Mathematics - B.M.Patel, J.M.Rawal and others, Nirali Prakashan, July 2010
- 2) Mathematics for Polytechnic - S. P. Deshpande- Pune Vidyarthi Griha Prakashan.
- 3) Fundamental of Mathematical Statistics - S.C.Gupta and Kapoor, S.Chand & Sons.

Course Name : Diploma in Civil Engineering  
 Course Code : DCE  
 Semester : Third  
 Subject Title : Building Construction  
 Subject Code : 131CE32

### 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	1	-	3	80	32	20	100	40	-	-	-	-	25	10	125

**Rationale:** Building construction is a core subject in civil engineering. This subject is intended for gaining useful knowledge with respect to facts. Concepts ,principles and procedures related to building construction system so that student can effectively plan ,execute building construction work and carry out repairs and maintenance of existing building with quality in construction. The subject helps to learn building materials required for construction.

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

- Identify various components of buildings and their functions.
- Know the procedure for execution of various constructions activities.
- Prepare checklist of operations for supervision of various construction activities.
- Identify & suggest rectification for the various defects in civil engineering works.

Sr. No.	Contents	L	M
<b>Section-I</b>			
1	Building as Structure: 1.1 Definition as per IS 1256-1958 1.2 Component of structure: Substructure (Foundation, Plinth & DPC) and Superstructure (Wall, Peirs, Floor, Lintel, Sill, Opening in Walls, Chajjas, Ceiling, Beams, Roof, Staircase, Wall finishes) neat sketch, its functions and requirement. 1.3 Load Bearing structure and framed structure. Comparison, Materials to be recommended for framed structure.	4	8
2	Foundation: 2.1 Definition, Function and essential requirement of good foundation, Types of foundation. Shallow and Deep Foundation. Depth & size of foundation. Definition of Different Bearing Capacity of soil. Most common	7	10

	<p>foundations, their suitability and requirement and neat sketches of Spread footing( Wall footing and isolated footing), Combined footing ( Inverted arch footing &amp; Continuous footing), Strap footing, Grillage foundation, Mat or Raft footing, Under reamed pile foundation.</p> <p>2.2 Plinth: Definition.</p> <p>2.3 DPC: Definition, Causes, effects, material used , DPC treatment to wall and basement.</p>		
3	<p>Masonry: Stone and Brick masonry : Definition and its different types</p> <p>3.1 Definition of different terms used in masonry.</p> <p>3.2 Principles of masonry construction</p> <p>3.3 Stone: Engineering properties and their selection, uses and tests Classification of stone masonry, Uncoursed and coursed Rubble masonry.</p> <p>3.4 Supervision of stone masonry construction</p> <p>3.5 Bricks: Characteristics of different classes of bricks. Proportion of burnt clay brick, Special brick, hollow brick, Flyash bricks.</p> <p>3.6 Rules for bonds in brick work, Different types of bond, Stretcher, Header, English and Flemish bond. Laying of Bricks.</p> <p>3.7 Supervision of brick masonry construction, tools &amp; plants used. Purpose of Cavity wall construction. Comparison of Stone and brick masonry.</p>	7	12
4	<p>Doors and Windows :</p> <p>4.1 Definition of technical terms, location of doors and windows, size and type of doors panelled doors, battened doors, flush doors, collapsible doors, rolling shutters, Revolving doors, Glazed doors. Sizes of door.</p> <p>4.2 Types of windows fully panelled, partly panelled &amp; glazed, glazed wooden, steel, Aluminum windows, sliding windows, louvered window, ventilators, cement grills.</p> <p>4.3 Fixtures and fastenings for doors and windows.</p>	6	10
	<b>Total of section - I</b>	<b>24</b>	<b>40</b>
<b>Section- II</b>			
5	<p>Stairs :</p> <p>5.1 Terms used, Classification of stairs, Stairs of different materials, specifications and suitability</p> <p>5.2 Design of dog legged staircase.</p>	8	13
6	<p>Finishes: Plastering , Pointing :</p> <p>6.1 Plastering: Definition, Object &amp; requirement of good plaster. Types of mortar for plastering.</p>	8	12

	<p>6.2 Different terminologies used in plastering work.</p> <p>6.3 Tools for plastering, number of coats of plaster.</p> <p>6.4 Detailed procedure of cement plastering. Types of plaster finishes, Defects in plastering, Special materials used in plastering.</p> <p>6.5 Pointing : Definition, mortar used in pointing, preparation of surface, methods of pointing &amp; types of pointing.</p>		
7	<p>Floors and Roof :</p> <p>7.1 Floors: Definition, Types of floor brick flooring, Cement concrete flooring, Mosaic flooring, Rubber flooring., floor finishes and suitability</p> <p>7.2 Roof : Definition, Different technical terms Requirement of ideal roof, Classification of roof, Pitched roof (Lean to roof, King post truss, Queen post truss),Types of Flat roof ( RCC roof), Selection of roof covering.</p>	8	15
	<b>Total of section -II</b>	<b>24</b>	<b>40</b>
	<b>Total of Section I &amp; II</b>	<b>32</b>	<b>80</b>

#### Tutorials:

Sr.No	List of Exercises
<b>A</b>	Making of sketches on quarter imperial sheet / A 4 size Drawing sheet book.
1	<p>Shallow foundation</p> <p>i) Rectangle Combined footing and Trapezoidal footing</p> <p>ii) Spread footing for column</p> <p>iii) Strap footing</p> <p>iv) Grillage rectangular footing.</p>
2	Deep foundation - Under reamed pile foundation
3	Any two methods of DPC treatment to wall and basement.
4	<p>Brick masonry</p> <p>i) Elevation of Brick wall</p> <p>ii) Plan showing alternate courses of brick walls in different thickness as 1BT, 1 ½ BT, in English bond</p> <p>iii) Plan showing alternate courses of brick walls in different thickness as 1BT, 1 ½ BT, in Single and Double Flemish bond.</p>
5	Plan, elevation and sectional elevation of any four types of Doors and Windows
6	<p>i) King Post Roof Truss with purlins and common rafter</p> <p>ii) Queen Post Roof truss</p> <p>iii) Couple roof &amp; Lean to roof</p>
7	Dog legged stair case with quarter space landing and mid landing
<b>B.</b>	Laying and constructing process for construction of brickwork and report writing

	of the process
<b>C.</b>	Site Visit (Any one) of the below
i)	Observing the process of painting in residential / public building and writing a report with reference to process and type of paint selected.
ii)	Observing and writing report of the process of water proofing of terrace or basement
iii)	Observing and writing report of the process of plastering.
<b>D.</b>	Students will have to make presentation (in a group of 8 -10 students) on different Non Conventional Materials, Low Cost Housing materials & Ecofriendly Materials.

**Termwork:**

Students shall submit journal and quarter imperial drawing sheets 15 in number.

**Learning Resources:**

**Text Books:**

1. Building Construction by Sushil Kumar Standard Publication, Edition 19<sup>th</sup> 1997
2. Building Construction by B. C. Punmia Laxmi Publication, Edition 10<sup>th</sup> 2009

**Reference Books:**

1. Building Construction by S. C. Rangawala Charotar Publication, Edition 25<sup>th</sup> 2007
2. Building Construction by S. P. Arora and Bindra Dhanpat Rai Publication Edition 4<sup>th</sup> 1988
3. Civil Engineering Materials by Technical Teachers Training Institute, Chandigarh Tata McGraw-Hill Publishing Company Ltd. New Delhi Edition 1<sup>st</sup> 1992.

Course Name : Diploma in Civil Engineering  
 Course Code : DCE  
 Semester : Third  
 Subject Title : Building Design & Drawing  
 Subject Code : 131CE33

### 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	
-	-	4	-	-	-	-	-	50	20	-	-	50	20	100	

**Practical Examination will be assessed by internal & external examiner.**

**Rationale:** Building Drawing is a core technology subject. Drawing is basically the language of Engineers. It is a means of communication between owner, architect, engineer and contractor. Civil Engineering Diploma holder has to supervise various construction processes and execute civil engineering structures such as buildings, roads, railways, dams, bridges; etc. He has to convert design parameters, process details into pictorial views. Therefore he is required to understand and prepare the drawings, interpreted it so that he can execute the works smoothly. Civil engineer should be competent to convert his ideas into the drawing. This helps him to transfer his ideas, thoughts to his subordinates on the site.

Good drawing makes his job simple and effective. Drawing helps in detailing the structures processes with quality parameter and is essential for drafting specifications and tender documents. The knowledge of this subject is useful for building construction, estimation and costing, design of structure, surveying, projects etc.

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

- Read, interpret and draw the building drawings.
- Prepare submission drawings for the buildings.
- Prepare working drawings for the building.
- Plan various types of buildings considering the functional requirements.
- Apply the building rules, regulations and byelaws for planning the building

**Contents:**

**Theory to be covered for practicals purpose:**

Sr. No.	Content
1.0	Introduction <ul style="list-style-type: none"> <li>• Purpose of drawing. Requirement of good drawing. Different types of drawing.</li> </ul>

	<p>Difference between Layout plan and Site plan.</p> <ul style="list-style-type: none"> <li>• Symbols- Symbols of different materials used in construction, building components.</li> <li>• Detailed description of requirement of essential particulars for drawing a sheet.</li> <li>• Reading of working drawings of residential buildings.</li> </ul>
2.0	<p>Planning Of Building</p> <ul style="list-style-type: none"> <li>• Principles of planning of Residential and Public building as per BIS: 7662 (Load bearing and RCC framed structures).</li> <li>• Space requirements and norms for various units of Residential and Public building. Recommended space standards for Public building (school building) as per IS 8827-1978.</li> <li>• Rules and byelaws of local governing authorities for construction. e.g. Building line, open spaces, FSI, Headroom, minimum room dimensions etc.</li> <li>• Introduction to design criteria for planning public building.</li> <li>• Drawing of line plans for residential and public building.</li> </ul>
3.0	<p>Types of Drawing</p> <ul style="list-style-type: none"> <li>• Development of line plan, Elevation, Section, Site Plan, Location Plan, Foundation Plan, Area statement and other details.</li> <li>• Significance of Submission drawing and working drawing.</li> </ul>

**Practicals:**

Sr. No.	Name of the Topic	Marks
1)	Students shall draw Measured Drawing of an existing residential building ( Load bearing) with flat terrace, showing Plan, Elevation, Sections, area statement, Schedule of doors and windows on Full Imperial size drawing sheet.	4
2)	Students shall draw Measured Drawing of an existing residential building ( Load bearing) with Pitched roof, showing Plan, Elevation, Sections Schedule of doors and windows , Section of pitched roof showing typical details on Full Imperial size drawing sheet.	4
3)	Students shall draw Measured Drawing of an existing G+1 residential building (Framed structure Type), showing Plan, Elevation, Sections, Construction notes, Schedule of doors and windows, Site Plan, Details of any one typical door and window ,etc on Full Imperial size drawing sheet.	10
5)	Students shall draw the line plans on full imperial size graph paper for the given data. Project work for planning of building in a group of 5-6 students may be given for different data. Oral examination will be based on this project work i.e. (Sr No 5 & 6). a) Bungalow ( Load bearing structure)	12



	a) Apartment- Framed Structure ( G+2) b) Public building ( G+1)	
6)	Students shall select any one of the above building mentioned in sr no 5 and draw following views on Full Imperial size drawing sheet. <ul style="list-style-type: none"> <li>• Typical Floor Plan</li> <li>• Elevation</li> <li>• Horizontal section passing through either kitchen or WC &amp; bathroom.</li> <li>• Vertical section passing through either kitchen or WC &amp; bathroom.</li> <li>• Also one section details passing through staircase.</li> <li>• Foundation plan.</li> <li>• Roof plan.</li> <li>• Site Plan.</li> </ul>	10

**Assignment:**

**Assignment to be submitted in drawing book.**

Sr.No.	Name of the Topic	Marks
1)	Students shall read and interpret the building drawings prepared professionally of already built structures. ( at least two)	1
2)	Students shall practice lettering and draw it as per IS 1962-1967	2
3)	Students shall draw symbols of materials, doors and windows etc. used , in drawing book	2
4)	Students shall draw different types of line work for good quality drawing	2
5)	Students shall draw neat dimensional sketch- Plan & Sectional elevation of Isolated Column Footing alongwith details of flooring.	3

**Reference Books:**

1. Text Book of Building Drawing by Shah, Kale, Patki, edition 4<sup>th</sup>, Publisher- Tata McGraw- Hill.
2. Civil engineering drawing and design by Shahane, edition 3<sup>rd</sup>, publisher-Poona Allies Book stall.
3. Civil Engineering Drawing by Malik & Mayo, edition 1972, Publisher- New Asian Publishers New Delhi.
4. Civil Engineering Drawing by M.Chakraborti, edition 3<sup>rd</sup> 1999, Publisher-Bhakti Vedant Book Trust.

**Codal References:**

National Building Code of India, BIS, edition 2002, publisher- BIS.

Course Name: Diploma in Civil Engineering

Course Code: DCE

Semester : Third

Subject Title: Environmental Studies

Subject Code: 131CE34

### 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	1	-	3	80	32	20	100	40	-	-	-	-	25	10	125

**Rationale:** Not only scientists, but common man and government are also worried about increasing threats to our environment. Hence basic knowledge about environment and pollution is essential. Environmental Studies has been introduced for diploma in Civil Engineering programme as per the Supreme Court directive in 2004.

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

- Know multidisciplinary nature of environmental studies.
- Know various types of environmental pollution, its causes, effects & control measures.
- Know about solid wastes management.
- Know social issues such as human population, human rights & HIV/ AIDS

### Syllabus

Sr. No.	Contents	L	M
<b>Section-I</b>			
1	The Multidisciplinary nature of environmental studies : Definition, scope and importance, Need for public awareness. 1.1 Social Issues- unsustainable to sustainable development, problems related to energy, water conservation. 1.2 Human Population- Population growth, population explosion, national family welfare programme, environment and human health, value education, HIV/AIDS 1.3 Role of Information Technology in Environment and Human health	02	06

2	<p>Natural Resources :</p> <p>Renewable and non renewable resources:</p> <p>2.1 Natural resources and associated problems</p> <ul style="list-style-type: none"> <li>▪ Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction, mining, dams and their effects on forests and tribal people.</li> <li>▪ Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.</li> <li>▪ Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.</li> <li>▪ Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity, case studies.</li> <li>▪ Energy Resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies</li> <li>• Land Resources: Land as a resource, land degradation, man induces land slides, soil erosion, and desertification.</li> </ul> <p>2.2 Role of individual in conservation of natural resources.</p> <p>2.3 Equitable use of resources for sustainable life styles</p>	08	12
3	<p>Eco Systems :</p> <p>3.1 Concept of an eco system</p> <p>3.2 Structure and function of an eco system.</p> <p>3.3 Producers, consumers, decomposers.</p> <p>3.4 Energy flow in the eco systems.</p> <p>3.5 Ecological succession.</p> <p>3.6 Food chains, food webs and ecological pyramids</p> <p>3.7 Introduction, types, characteristic features, structure and function of the following eco systems-</p> <p style="padding-left: 40px;">Forest ecosystem</p> <p style="padding-left: 40px;">Grass land ecosystem</p> <p style="padding-left: 40px;">Desert ecosystem</p>	08	12

	Aquatic eco systems(ponds, streams, lakes, rivers, oceans, estuaries)		
4	<p>Biodiversity and it's Conservation :</p> <p>4.1 Introduction-Definition: genetics, species and ecosystem diversity.</p> <p>4.2 Biogeographically classification of India.</p> <p>4.3 Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.</p> <p>4.4 Biodiversity at global, national and local level.</p> <p>4.5 India as a mega diversity nation.</p> <p>4.6 Hot-spots of biodiversity.</p> <p>4.7 Threats to biodiversity: habitats loss, poaching of wild life, man wildlife conflicts.</p> <p>4.8 Endangered and endemic spaces of India.</p> <p>4.9 Conservation of biodiversity: in-situ and ex-situ conservation of biodiversity.</p>	06	10
	<b>Total of Section I</b>	<b>24</b>	<b>40</b>
<b>Section-II</b>			
5	<p>Environmental Pollution :</p> <p>Definition Causes, effects and control measures of:-</p> <p>5.1 Air pollution</p> <p>5.2 Water pollution</p> <p>5.4 Soil pollution</p> <p>5.5 Marine pollution</p> <p>5.6 Noise pollution</p> <p>5.7 Thermal pollution</p> <p>5.8 Nuclear hazards</p>	18	30
6	<p>Solid Waste Management :</p> <p>6.1 Functional elements of solid waste management, methods of solid waste disposal.</p> <p>6.2 Comparison of solid waste disposal methods.</p> <p>6.3 Role of an individual in prevention of pollution.</p>	06	10
	<b>Total of Section II</b>	<b>24</b>	<b>40</b>
	<b>Total of section I &amp; II</b>	<b>48</b>	<b>80</b>

**List of Tutorials / Assignments:**

**Term Work:**

1. Students shall submit journal consisting of 5 assignments based on above Syllabus.
2. Students (in a group of 7-8 students) shall give seminar on a current topic related to environmental issues.

**Learning Resources:****Text books:**

1. Environmental Studies by Anindita Basak Pearson Publication, 1<sup>st</sup> Edition, 2009.
2. Environmental Studies by Anubha Kaushik and C.P. Kaushik New Age International (P) Ltd., 2007, 1<sup>st</sup> Edition, 2007.
3. Fundamental concepts in Environmental Studies, D D Mishra, S Chand & Co Ltd, 1<sup>st</sup> Revised edition 2009
4. Textbook of Environmental studies, Erach Bharucha, UGC, 1<sup>st</sup> Edition, 2011

**Reference Books:**

1. Environmental Pollution and Control by Dr. H.S. Bhatia. Galgotia Publications (p) LTd. 1<sup>st</sup> edition, 1998.

**Site Visits:**

1. Visit to nearby industry to know how they are controlling pollution.
2. Study of any infrastructural developmental activity to study environmental impact assessment.

Course Name: Diploma in Civil Engineering

Course Code: DCE

Semester : Third

Subject Title : Surveying

Subject Code: 131CE35

### 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:

For preparing any map or drawing, the initial requirement is to conduct the survey. For conducting the survey students must be able to operate and handle various survey instruments/equipment like compass, level, plane table etc. In this course such desired performing abilities will be developed which may be expected of a Civil Engg. The Civil Engg. & technicians are often required to use survey instruments on site or on field and are also required to measure angle, length, area, elevation etc. Moreover, they are sometimes required to update or check the given details in the map or drawing.

#### Objective:

Students will be able to:

- Use the survey instruments.
- Take linear and Angular measurements.
- Prepare layouts and maps.
- 4 .Use Theodolite and Plane table.
- Compute area and volume.

Sr.No.	Contents	L	M
<b>Section -I</b>			
1	Introduction : 1.1 Classification and General principles of surveying, 1.2 Different types of scales 1.3 Chain and tape survey 1.4 Conventional symbol of objects in the map 1.5 Instruments for chain survey 1.6 Instruments for setting right angles 1.7 Chain and tape correction 1.8 Obstacles in chaining and ranging	06	08

2	Compass Traversing: 2.1 Introduction and purpose 2.2 Principles of compass surveying 2.3 Methods of traversing 2.4 Types of meridians and bearings 2.5 Types of compass- Prismatic and Surveyor's compass 2.6 Computation of included angles 2.7 Magnetic declination and Local attraction 2.8 Closing error and its elimination by Bowditch's rule 2.9 Field procedure of compass traversing 2.10 Sources of error in compass	08	12
3	Plane table surveying: 3.1 Plane table and its accessories, 3.2 Temporary adjustment in plane table survey 3.3 Orientation of plane table 3.4 Methods of plane tabling- radiation, intersection, traversing 3.5 Errors and Precautions in plane table survey. 3.6 Advantages and Disadvantages of plane table survey	04	06
4	Levelling : 4.1 Definitions and Essential parts of level 4.2 Types of levels and leveling staff 4.3 Temporary adjustments of level 4.4 Terms used in leveling, 4.5 Recording and reduction of observations 4.6 Computation of RLs by H.I and Rise and fall method 4.7 Methods of leveling 4.8 Curvature and refraction correction, 4.9 Difficulties in leveling 4.10 Errors in leveling	10	14
<b>Section -II</b>			
5	Contouring: 5.1 Definitions 5.2 Object and use of contour map 5.3 Characteristics of contour lines 5.4 Methods of contouring. 5.5 Interpolation of contours	03	08
6	Theodolite and its use : 6.1 Components of transit theodolite and their functions 6.2 Definitions of some common terms 6.3 Procedure to read vernier and micrometer theodolite 6.4 Temporary adjustments of transit theodolite	09	14

	6.5 Fundamental axis of theodolite and their relationship 6.6 Measurement of horizontal and vertical angle, 6.7 Miscellaneous operation with theodolite- prolongation of a straight line, ranging a line, laying off an angle, measurement of deflection angle. 6.8 Permanent adjustment of theodolite 6.9 Errors in theodolite		
7	Tringnometrical leveling - Introduction 7.1 Measurements of heights and distance in the following cases 7.1.1 Base of the object is accessible. 7.1.2 Base of the object is inaccessible and instrument stations and the elevated objects are in the same vertical plane. 7.1.3 Base of the object is inaccessible and instrument stations and the elevated objects are not in the same vertical plane.	03	08
8	Computation of area and volume : 8.1 Introduction 8.2 Computation of area from field notes 8.2 Methods of computations of area from plotted plan - Trapezoidal rule, Average ordinate rule, Simpson's 1/3 rule 8.3 Planimeter construction and use 8.4 Zero circle of the planimeter 8.5 Methods of computations of volume –Trapezoidal, Prismoidal formula and volume from spot level	05	10
	<b>Total of Section I &amp; II</b>	<b>48</b>	<b>80</b>

**List of Practicals:**

- 1 Study of various instruments used for linear measurement and minor instruments
- 2 Study of prismatic and surveyor's compass, measurement of bearings, computation of included angles
- 3 Plane table method -Radiation, Intersection and Traversing.
- 4 Study of dumpy, tilting auto level
- 5 Differential leveling practice, reduction of level by HI and Rise and Fall method, Fly leveling.
- 6 Study of theodolite – measurement of horizontal angle
- 7 Measurement of horizontal angle by method of repetition
- 8 Measurement of vertical angle.
- 9 Laying of an angle by method of repetition



- 10 Prolonging a straight line with the help of theodolite and Measurement of deflection angle.
- 11 Trigonometrical leveling - One plane method and Two plane method
- 12 Use of Amslar polar planimeter for finding the area of irregular figures and certifying it by using Digital Planimeter

**Project**

A two days project on Theodolite traversing and Plane Table detaling.

**Term Work:**

Term work shall consist record of all practicals and project in field book alongwith 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<sup>th</sup> Edition 2008.

**Reference Books:**

Surveying and Leveling Vol. I, II by B. C. Punmia, Publisher: Laxmi Publication, 16<sup>th</sup> edition, 2005.

Course Name: Diploma in Civil Engineering  
 Course Code: DCE  
 Semester: Third  
 Subject Title: Mechanics of Structures  
 Subject Code: 131SE36

### 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	

#### Rational:

This course in Mechanics of Structure is pre-requisite to understand Theory of structures and Structural Design. The effect of different types of loads that may act on the structures will be in various ways. The engineer has to decide whether the material of which, the structure is made can develop enough strength to resist these loads safely. This course, therefore, covers the topics such as bending theory, stress on oblique planes, deflection of the structures due to various types of loads etc.

#### Objective:

Student will be able to:

- Calculate Stresses in simple and complex section.
- Calculate deformations of the specimen subjected to uni-axial, biaxial and tri-axial stress system.
- Analyses truss by different methods.
- Draw shear force and bending moment diagram.
- Calculate moment of inertia of standard plane section and their components.
- Calculate shear stress and bending stress in beam cross section.
- Calculate Strain energy for different types of loading.

Sr.No.	Contents	L	M
<b>Section I</b>			
1	Stress and Strain: Hook's law. Modulus of elasticity, Modulus of rigidity, Bulk Modulus, Poisson's ratio, simple shear, complementary shear, relation between E, G, K. Behavior of mild steel under tension, load extension curve, yield stress, factor of safety, working stresses. Temperature stresses. Stresses in composite sections	08	10

	under axial loading..		
2	Beams: Bending moments, shear force and axial forces in simply supported cantilever and overhanging beams. Plotting of B.M.D., S.F.D., and A.F.D. for concentrated and uniformly distributed loads. Relation between shear force and bending moments at a section, point of contra	08	10
3	Simple theory of Bending: Flexure formula for straight prismatic beams, Principle axes and moment of a section, moment of resistance, simple problem in application of flexure formula, fletched beams.	06	10
4	Shear stresses: Distributions of shear stresses across plane section and I beams.	02	10
	<b>Total of section I</b>	<b>24</b>	<b>40</b>
<b>Section II</b>			
5	Bending combined with axial loads: Eccentric loading of a section, middle third rule, core of section.	06	10
6	Principle stresses and Principle planes: Stresses in oblique planes, principle plane and stresses, Analytical and Graphical methods	08	10
7	Bolted and welded joints: Various types of bolted and welded joints, modes of failure, Efficiency of joints.	03	10
8	Deflection of beams: Double integration method, moment area method and conjugate beam Method. Application to simply supported beams, cantilever and over hanging beams.	07	10
	<b>Total of Section II</b>	<b>24</b>	<b>40</b>
	<b>Total of Section I &amp; II</b>	<b>48</b>	<b>80</b>

**Term Work:**

Laboratory journal containing at least seven experiments out of the following:

Sr. No.	Name of Experiments
1	Tension test on M.S. bar.
2	Briell Hardness Test on M.S., C.I. & Brass specimen
3	Izod impact test on M.S. bar and brass specimen
4	Torsion test on M.S specimen
5	Shear test on M.S. , C.I. brass specimen
6	Transverse test on Cast Iron
7	Rockwell hardness test
8	Vickers Hardness test

**Text Books:**

Mechanics of structures by S. B. Junnarkar, 21<sup>st</sup> edition 2010, Charotar Publishing. House.

**Reference Books :**

1. Strength of Materials by S. Ramamrutham, 15<sup>th</sup> edition 2006, Publisher-Dhanpat Rai.
2. Strength of materials by C.H. Ryder, edition 2002, Macmillan publishers.

Course Name: Diploma in Civil Engineering

Course Code: DCE

Semester :Third

Subject Title : Development of Life Skills

Subject Code: 131HM37

### Teaching and 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	-	-	-	-	-	-	-	-	-	25	10	25	

#### Rationale:

Anyone aspiring for professional success in various fields of technology and management has to make a quick and lasting impact on the employers at different levels of his/her career. Effective communication skills is a necessity today and a mastery of both productive skills and managerial skills will enable students, job seekers and technologists in industry to realize their goals of entering either a prestigious institution or getting a coveted job. Their oral skills will enable them to perform better during interviews, group discussion, and presentation and while delivering speeches. Presentation skills will give the students confidence, foster team spirit and enhance their power of expression which will be helpful for them in future while holding seminars and conferences. Further, all competitive exams are exacting and require students to be proficient in the written form. All writings in industries and management require responsible and formal communication. Powerful written communication is possible only by understanding the basics of various kinds of formal writing like summaries and resume. Ability to write honest and impressive resumes is imperative in order to secure a job of one's choice. In addition, managerial skills like time management, body language and positive thinking will shape their personality and enable all round development.

Thus it can be concluded that efficacious communication in verbal and nonverbal form is indeed the sure gateway to success in the professional world.

#### Objective:

- To train students in overcoming stage fright, to attain composure, to organize thought process and develop voice modulation and body language.
- To develop students' interpersonal skills and leadership quality, to improve their listening and persuasive skills, and train them in the ways of identifying the source of information, collecting and planning.

- To prepare students for interview, make them aware of personal grooming and concept of time , to teach students positive thinking as an ongoing process, to have optimistic approach, to cultivate right values and attitude.

Learning Structure:

Application:

To enable the students to communicate effectively through oral communication and presentation skills

Procedures:

1. Techniques of communicating confidently
2. Principles governing the appropriate use of verbal communication
3. Techniques of effective speaking

Principles:

1. Principles of management in communication skills
2. Principles of appropriation and contextualization of the use of non-verbal communication

Concept:

1. Concept of oral and written skills
2. Concept of manners, etiquette and personality development
3. Concept of time management and interview techniques

Facts:

1. Theory of communication
2. Theory of oral skills
3. Formats of resume and summarization

Sr. No.	Topic	L
01	Oral Skills and Writing Skills	
	• Elocution	4
	• Group Discussion	4
	• Presentations	6
	• Technical paper presentation	2
	• Planning and preparing for an industrial visit	2
	• Written report on an industrial visit	2

02	<b>Managerial Skills</b> <ul style="list-style-type: none"> <li>• Interview Techniques</li> <li>• Resume</li> <li>• Time Management</li> <li>• Manners &amp; Etiquette</li> <li>• Personality Development</li> <li>• Positive thinking</li> </ul>	2 2 2 2 2 2
	<b>Total</b>	<b>32</b>
03	<b>Practical</b> <ol style="list-style-type: none"> <li>1. Students deliver a prepared speech.</li> <li>2. Group discussions conducted in class</li> <li>3. Group of 6-7 students make a power point presentation</li> <li>4. Assignments on resume writing.</li> <li>5. Mock interviews in class</li> <li>6. Role play by students.</li> </ol>	

**Term Work:**

Students should submit term work file based on above topics.

Skills to be developed for practical:

Intellectual Skills:

1. Skills of elocution
2. Collecting and summarizing information
3. Drafting and presenting

Motor Skills:

1. Use of appropriate body language and oral skills

**Text Book:**

1. Business Communication- Raman Meenakshi, Oxford, India, 1<sup>st</sup> edition, 2008

**Books for Reference:**

1. Contemporary Management, Gupta C. B., APH, New Delhi, 1<sup>st</sup> edition, 1992
2. Organisational Behaviour, Sekaran Uma, Tata Mcgraw Hill, New Delhi, 2<sup>nd</sup> edition, 2008
3. Technical Communication, Raman Meenakshi, Sharma Sangeeta, OUP, India, 2<sup>nd</sup> impression, 2004

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