Veermata Jijabai Technological Institute (V.J.T.I)

(Central Technological Institute, Maharashtra State, INDIA)

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Programme: Diploma in Civil Engineering (DCE) | **Semester: IV** | **Implemented from: 2017**

| COURSE CODE	COURSE	GR	L	T	P	CR	PAPER HRS	TH Max	TH Min	IST	TOTAL Max	TOTAL Min	PR Max	PR Min	OR Max	OR Min	TW Max	TW Min	TOTAL MARKS
171CE41	ADVANCED SURVEYING	C	3	0	4	7	3	80	32	20	100	40	25**	10			25@	10	150
171CE42	RAILWAY ENGG., DOCKS & HARBOUR	A	3	1	0	4	3	80	32	20	100	40			25**	10	25@	10	150
171CE43	BUILDING REPAIR AND MAINTENANCE	A	3	0	2	5	3	80	32	20	100	40					25@	10	125
171SE44	THEORY OF STRUCTURES	C	3	2	0	5	3	80	32	20	100	40			25**	10	25@	10	150
171CE45	HYDRAULICS	C	3	0	2	5	3	80	32	20	100	40					25@	10	125
171CE46	COMPUTER AIDED DRAWING	A	0	0	3	3							25**	10			25@	10	50
171CE47	TOWN PLANNING	C	2	0	2	4									25**	10	25@	10	50
	TOTAL		17	3	13	33		400		120	500		50		75		175		800

Abbreviations: B – Basic; C – Core; A – Applied; M – Management; L – Theory Lecture; T – Tutorial; P – Practical; TH – Theory Paper; IST – In-Semester Test; PR – Practical Exam; OR – Oral Exam; TW- Term Work, @- Assessment by Internal Examiner *: Indicates assessment by Internal Examiner, **: Assessment by External and Internal Examiner

NOTE: a) During Summer Break after IV semester (i.e. between IV and V Semester), students have to undergo mandatory 6 weeks industrial training in large or medium scale industries relevant to the branch or discipline of engineering. This training would be evaluated during V semester.

b) Students have to prepare report of training, which will be evaluated during V semester.

Curriculum Coordinator
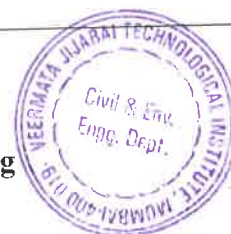
Head
Diploma in Civil Engineering

Dean Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FOURTH
COURSE TITLE	: ADVANCED SURVEYING
COURSE CODE	: 171CE41

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME													
L	T	P	CR	PAPER HRS	TH		MST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	0	4	7	3	80	32	20	100	40	20**	20			25@	10	150

**: assessment by External and Internal Examiner, @: assessment by Internal Examiner

Course Objectives:

This course comes as an extension to the elementary surveying principles taught in the "Surveying" course. There has been for rapider advancement in the area of surveying compared to other division of civil engineering. In the field of topographic survey one notable contribution of electronics has been the Total station. An introduction of total station and GPS in advanced surveying the preparation of a map with contour lines has become very simple. On completion of course students will able to invoke advanced surveying techniques over conventional methods in the field of civil engineering.

Course Outcomes:

Student should be able to

CO1	Compute areas and volumes from various survey data
CO2	Calculate the distance and elevation by using tachometer
CO3	Operate various electronic instruments such as Digital theodolite, Auto level, Digital level and Total station
CO4	Demonstrate the setting out a curve and building
CO5	Explain geospatial techniques such as GPS and Remote sensing in the field of Surveying and mapping

Course Content:

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
		SECTION-I						
1		Computation of Area and Volume	06	10	1	30%	40%	30%
	1.1	Introduction						
	1.2	Computation of area from field notes						
	1.3	Methods of computations of area from plotted plan - Trapezoidal rule, Average ordinate rule and Simpson's 1/3 rule						
	1.4	Planimeter construction and use (Amslar polar and Digital Planimeter)						
	1.5	Zero circle of the Planimeter						
	1.6	Methods of computations of volume –Trapezoidal, Prismoidal formula and volume from spot level						
2		Tachometric surveying	11	18	2	30%	40%	30%
	2.1	Introduction: Basic principles stadia of tachometry						
	2.2	Determination of tachometer constant : Lab measurement and field measurement						
	2.3	Anallatic lens: Objective and theory						
	2.4	Methods of tachometry: fixed hair, movable hair and tangential method, substance bar						
	2.5	Determination of Tachometric measurement: Distance and elevation formulae for						

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
		inclined line of sight with staff vertical						
	2.6	Determination of Tachometric measurement: Distance and elevation formulae for inclined sight with staff normal to the line of sight						
3		Modern surveying instruments:	07	12	3	30%	30%	40%
	3.1	Introduction of electronics in surveying: General principles used in the instruments						
	3.2	Auto levels, self-compensating instrument, Digital Level						
	3.3	Electronic distance measurements (EDM): Principle, Components and use						
	3.4	Electronic digital theodolite: construction and use						
	3.5	Concept of Total station: construction and use						

SECTION-II

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
4		Setting out of curves and civil works	10	16	4	20%	40%	40%
	4.1	Introduction: Definition of different terms, necessity of curve.						
	4.2	Types of curves: Horizontal & Vertical curves						
	4.3	Elements of simple circular curve						
	4.4	Methods of setting out simple circular curve: Linear, angular and Instrumental						

		method (two theodolites and Rankin's deflection angle method).						
	4.5	Reverse and transition curves: properties and advantages						
	4.6	Vertical curves- definition , geometry and types						
5		Remote sensing	06	10	5	40%	40%	20%
	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						
6		Global Positioning System (G.P.S)	08	14	5	40%	40%	20%
	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.						

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

Suggested Specification Table

Unit No.	Unit Title	Teaching Hours	Total Marks	R Level	U Level	A Level
1	Computation of Area and Volume	06	10	30%	40%	30%
2	Tachometric surveying	11	18	30%	40%	30%
3	Modern surveying instruments:	07	12	30%	30%	40%
4	Setting out of curves and civil works	10	16	20%	40%	40%
5	Remote sensing	06	10	40%	40%	20%
6	Global Positioning System (G.P.S)	08	14	40%	30%	20%
		48	**80**			

List of Practicals/Assignments/Tutorials:

Sr. No.	Unit	Practical/Assignment/ Project	Approx. Hours	CO
1	1	To find the area of irregular figures and certify it by using Digital Planimeter	04	1
2	2	To determine the multiplying and additive constant of the given Tachometer and to verify it with field distance	04	2
3	2	Tachometric Practice	04	2
4	2	To find the gradient of a line joining two points	04	2
5	3	To determine the reduced level of a points by using Auto level	04	3
6	3	Study of Digital theodolite - Measurement of horizontal and vertical angle	04	3
7	3	To determine the horizontal, sloping and vertical distance between the points by using Total Station. (Practice)	04	3
8	3	Mapping by Total station	04	3
9	4	To set out a simple curve by (linear and angular method)	08	4
10	4	To set out a building (Load bearing and R.C.C structure)	08	4
11	6	To collect the field data like point, line and area data by using surveying and mapping GPS receiver	04	5
12	3	One day project on Block contouring	1day	3
13	2	One day project Tachometric contouring	1day	2

* Minimum 8 and maximum 12 practicals/experiment sessions to be included in a course in a term

Term work:

Term work shall consist record of all Practicals and project in field book along with drawing of project work on full imperial drawing sheets.

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Satheesh Gopi, R.Sathikumar & N. Madhu	Advanced Surveying – Total station, GIS and Remote sensing	Pearson Education
2	Dr.K.R.Arora	Surveying Vol. II & III	Standard Book House, 15th Edition 2015
3	B.C.Punmia	Surveying & Levelling Vol.II & III	Laxmi Publication, 16th Edition 2005

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	R.Agor	Surveying	Khanna Publisher
2	K.Anjali Rao	Remote sensing and Geographical Information System	BS Publication

Curriculum Coordinator

Head
Diploma in Civil Engg.

Dean - Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FOURTH
COURSE TITLE	: RAILWAY ENGG.,DOCKS & HARBOUR
COURSE CODE	: 171CE42

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
				PAPER HRS	TH		MS T	TOTAL		PR		OR		TW		TOTAL MARKS
L	T	P	CR		Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	1	0	4	3	80	32	20	100	40	--	--	25**	10	25@	10	150

** - assessment by Internal & External Examiner.   @- assessment by Internal Examiner.

Course Objectives:

This course is intended to teach the students basic concepts in transportation engineering, its component parts, Docks & Harbour, its layout, port facilities, monorail & metro etc.

Course Outcomes:

After completion of the course the student will be able to

CO1	Explain the basic concepts in transportation engineering systems.
CO2	Evaluate the component parts, construction & geometric design of railways.
CO3	Interpret various types of stations and yards and maintenance procedure.
CO4	Describe docks and habours and its maintenance.
CO5	Examine various port facilities.

Course Content:

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Introduction to Railway Engineering:**				Theory Marks		
1	1.1	**Technical terms**: railway, rolling stock, types of rolling stock, locomotive, coach, wagons, goods stock.	02	04	1	50%	50%	--
	1.2	**Necessity of railways:** advantages of railways, merits of railways with respect to roadways, waterways and airways.						
2		**Railway Engineering:**						
	2.1	**Engineering Aspects:** Alignment and gauges - Classification and zones of Indian Railway. Alignment-Factors governing rail alignment. Rail gauges types.	06	10	2	30%	40%	30%

		Topics/Sub-topics						
	2.2	**Permanent ways:** Various components & their functions, various materials used. Rails- Types, creep of rails, causes & prevention of creep. Sleepers types – wooden, metal and concrete, their comparison. Ballast Types- properties, merits & demerits. Rail fixtures & fastenings-fish plate, bearing plates, spikes, bolts, keys, anchors & anti creepers, applications.						
3		**Geometric Design**						
	3.1	**Railway Track Geometrics:** Coning of wheels, tilting of rails, gradient & types, Super elevation, limits of super elevation, cant & cant deficiency, numerical based on above topic.	09	12	2	30%	30%	40%
	3.2	**Points and crossings:** Definition & types of points, crossing, Track Junctions, Turnouts, Crossovers, Diamond crossing.						
		Signals: Types, Interlocking, various control systems of train movements.						
4		**Station and Yards**						
	4.1	**Types of stations**: way side, crossing, junction, terminal. Yards- types, passenger yards, goods yard and locomotive yard, requirement of locomotive yard, Marshalling yard, types & layout of marshalling yard.	05	10	3	30%	40%	30%
	4.2	**Track Maintenance:** Necessity, types, tools required, organization flow chart with duties gang mate, key man.						
	4.3	**Track Drainage:** significance, requirements , types						
5		**Introduction to Modern Modes of Railways**	02	04	1	--	50%	50%
	5.1	**Mono-rails**						
	5.2	**Metro-rails**						
	5.3	**Bullet Train**						
SECTION-II								
Unit & Sub-Unit		Topics/Sub-topics						
6		**Docks and Harbour Introduction**						
	6.1	**Docks & Harbour:** Introduction, Importance, Definition of Docks & Harbour.	05	08	4	50%	25%	25%
	6.2	**Port:** Classification of Ports & Harbours, Requirement of Port,						

7		**Docks & Harbour- Aspects**						
	7.1	**Harbour layout:** Selection of site, Break waters, Jetties, Wharves, Piers. Dolphin, Quays	08	10	4	50%	30%	20%
	7.2	**Docks:** Types of Docks, Feature, Shape of Docks & Basins, Dock Entrances.						
8		**Harbours Maintenance**						
	8.1	Maintenance, Dredging, Dredging Equipments.	05	10	4	40%	40%	20%
	8.2	Navigational aids						
	8.3	Ship characteristics and their influence						
9		**Port Facilities**						
	9.1	Transit sheds Warehouses, General layout	06	12	5	25%	50%	25%
	9.2	Container and container yards, Cargo Handling.						

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms' Revised Taxonomy).

SUGGESTED SPECIFICATION TABLE WITH HOURS (Theory)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to Railway Engineering	02	50%	50%	--	04
II	Railway Engineering	06	30%	40%	30%	10
III	Geometric Design	09	30%	30%	40%	12
IV	Station and Yards	05	30%	40%	30%	10
V	Types of Railway	02	--	50%	50%	04
VI	Docks and Harbour Aspects	05	50%	25%	25%	08
VII	Docks & Harbour	08	50%	30%	20%	10
VIII	Harbours Maintenance	05	40%	40%	20%	10
IX	Port Facilities	06	25%	50%	25%	12
TOTAL		48				80

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

List of Practicals/Assignments/Tutorials:

Sr. No.	Unit	Assignments	Approx. Hours	CO
1.	1	Introduction to Railway Engineering – brief description of railways and docks and habours.	1	1
2.	2	Railway Engineering-zones of Indian Railway, Alignment, Types of Rails Ballast, Sleepers, Rail Fixtures & Fastenings.	2	2
3.	3	Geometric Design- Aspects of Rail Geometrics, Points, Crossings, & Signals.	2	2
4	4	Station and Yards- Types of Stations & Yards	1	3
5	5	Modern Modes of Railways – a)Monorail b)Metro Rail & c) Bullet Train	2	1
6	6	Commuter Friendly Infrastructures to these Modern Modes like Skywalks, FOB's. It's layout indicating any one station. A group of 5 to 6 students shall select one station for layout.	1	1
7	7	Station Traffic Control Systems like Card Swipe Detection Barriers.	1	1
8	8	PPP's in such Modern Transport Project.	1	1
9	9	Docks, Harbour & Ports- Introduction and Aspects	1	4
10	10	Harbours Maintenance- Dredging Procedures & Equipments	1	4
11	11	Port Facilities- Transit sheds Warehouses, General layout	1	5
12	12	Site Visit Report of Railway Station or Docks & Harbour	2	2,5
13	13	**Mini Projects**- students will work in group on following : 1. Maintenance procedures of any one railway station. 2. Components of Railway track. 3. Construction details and technical specifications of a) Mono Rail b) Metro Rail c) Bullet Train 4. Various signals, signs and symbols (with sketches) used in Railway Engineering. 5. Various facilities provided in Docks, Ports &Harbour. 6. Drawing the layout of Railway network of Mumbai city.		
* Minimum 8 and maximum 12 practicals/experiment/Tutorials sessions to be included in a course term work in a term.				

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1.	S.P. Chandola	A text book of Transportation Engineering	Publisher: S Chand & Company Ltd, New delhi-110055 Edition: 1st, 2001
2.	S.C. Rangawala	Railway Engineering	Charotar publishing house private Ltd, Anand 38801, Gujarat India. Edition : 14th,2005.
3.	R. Shrinivasan	Harbour, Dock & Tunnel Engineering	Publisher: Charotar Publishing House, Anand Edition : 28th, 2016

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1.	S.C. Saxena & Arora S.P.	Railway Engineering	Publisher :Dhantpat Rai Publications Pvt. Ltd. New Delhi-110002. Edition:6th, 2004
2.	IS Codes		Bureau of Indian Standards
3.	Websites: a) http://nptel.ac.in/courses/105107123/ b)http://www.indianrailways.gov.in/railwyaboard/view_section.jsp?lang=0&id=0,1,304,366, 526,1593		

Curriculum Coordinator   **Head**   **Dean - Diploma**
                                   Diploma in Civil Engg.

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FOURTH
COURSE TITLE	: BUILDING REPAIRS AND MAINTENANCE
COURSE CODE	: 171CE43

Teaching & Examination Scheme

TEACHING SCHEME				PAPER HRS	EXAMINATION SCHEME												TOTAL MARKS
					TH		MST	TOTAL		PR		OR		TW			
L	T	P	CR		Max	Min		Max	Min	Max	Min	Max	Min	Max	Min		
3	-	2	5	3	80	32	20	100	40			-	-	25@	10		125

@: Assessment by Internal Examiner

Course Objective:

Civil Engineering students need to acquire the repair, maintenance & rehabilitation skill when performing their job in construction industries. This course enables and motivates the students as entrepreneur to get the idea of failure pattern, evaluation of strength of structures, decides the remedial techniques of repairs, maintenance & rehabilitation of Civil Engineering structure.

Course Outcomes:
Students should be able to

CO1	Relate various types of defects in structures & their causes.
CO2	Describe StructuralAudit and Non-Destructive Test procedure.
CO3	Select suitable repairing method for building structures.
CO4	Compare different materials used for repairs of defects/ damages in a building.
CO5	Adapt suitable waterproofing method and maintenance method for the building.

Course Content:

Unit	Sub unit	Topics/Subtopics	HRS	Marks	CO	R Level	U Level	A Level
		Section I						
1	01	Introduction:	02	04	1	40%	60%	
	1.1	Meaning of Operation, Maintenance, Repair , Restoration and Rehabilitation of structure						
	1.2	Need of Repair, Maintenance and Rehabilitation of Civil Engineering Structure						
2		Defects in Building:	05	12	1	40%	40%	20%
	2.1	Different factors affecting structural deterioration /defects						
	2.2	Principal causes and broad classification of cracks						
	2.3	Different Defects in RCC member slab, beam, column						
	2.4	Common sources of leakages in bathroom, kitchen and balcony floor.						
	2.5	Causes of Corrosion of reinforcement.						
	2.6	Leakages in Plumbing and Sanitary system in Building;						
3		Condition Survey & Non Destructive Testing:	07	10	2, 1	20%	40%	40%
	3.1	Detailed Inspection Survey, Structural Audit, Internal and External Observation Report, Difficulties encountered during Structural Audit. Different Government bodies dealing with Structural Audit.						
	3.2	Structural Audit Report Format						
	3.3	N.D.T. methods. Principles and method of application of Ultrasonic Pulse method, Rebound Hammer test asper IS recommendation.						

4		Materials for Repairs:	10	14	4	40%	60%	
	4.1	Characteristic features of Injection Grout, Bonding Coat, Bond coat, Plasticizer, Self-Flow Micro Concrete Polymer/Epoxies Repair mortar, Quick Setting Compound, Retarder, Waterproofing compound.						
	4.2	Rebar, Characteristics of different types of rebar.						
	4.3	Function of Admixture in concrete as per ACI 212-3R Air Entraining Admixtures and Water-Reducing Admixtures in concrete. Ferro-cement- Material for structural waterproofing and structural repairs						
	4.4	Crack sealant						
	4.5	SBR Polymer, Fiber glass fabric						
		Total of Section I	**24**	**40**				
		Section II						
5		Water Proofing Technique:	11	16	5	20%	40%	40%
	5.1	Correct method of fixing pipe fitting inside toilet and bathrooms. Prevention cum Remedial methods to arrest leakages from wet areas.						
	5.2	Waterproofing system in Toilet, Bathroom, Sunk area of Water closet block, chajjas and terrace, Basement, Underground reservoirs water tank.						
	5.3	Guide lines for Structural Repairs to R.C.C. Structure, Sealing of Cracks in Concrete. Repairs of corroded R.C.C surfaces and waterproofing with epoxy formulation.						
	5.4	Repairs of damaged concrete floor in industrial plant						

	5.5	Waterproofing with Fiber reinforced epoxy membrane						
6		Maintenance of Building	04	08	5	40%	40%	20%
	6.1	Concept of decay, defects and damage of structure						
	6.2	Definition and aim of Maintenance						
	6.3	Classification of Maintenance- Routine, Preventive and Remedial methods						
	6.4	Planned Maintenance Report						
07		Techniques for Repairs:	09	16	3	40%	40%	20%
	7.1	Rust Eliminators and polymer coating for rebar during repair						
	7.2	Repair of defective concrete or Concrete spalling						
	7.3	Repair of cracks in plaster and on RCC surface						
	7.4	Aerated and Foamed concrete, dry pack mortar, vacuum concrete						
	7.5	Gunite and Shotcrete						
	7.6	Jacketing Technique for Restoration of structure: Definition, Purpose, types of method.						
	7.7	Underpinning and its different types						
		Total of Section II	**24**	**40**				
		Total of Section I & II	**48**	**80**				

List of Practicals/Assignments/Tutorials:

Sr. No.	Unit	Practicals	Approx. Hours	CO
1	3	Study of Ultrasonic Sonic Pulse Velocity method	2	CO2

2	3	Study of Rebound Hammer test	2	CO2
3	3	Determination of compressive strength of M15 grade of concrete cube using USPV method	2	CO2
4	3	Determination of compressive strength of M15 grade of concrete cube using Rebound Hammer test	2	CO2
5	3	Determination of compressive strength of M20 grade of concrete cylinder using USPV method	2	CO2
6	3	Determination of compressive strength of M20 grade of concrete cylinder using Rebound Hammer test	2	CO2
7	3	Study of different defects observed in building by Visual Survey.	2	CO1
8	2	Study of any five major defects observed in beam, column, slab.	2	CO1
9	4	Market survey of different repair materials.	4	CO4
10	3	Review of Structural Audit Report	2	CO2
		MiniProject: Students will work in a group on the following topics		
1	6	Presentation on Different case study on Maintenance and Rehabilitation of Civil Engineering Structure	2	CO5
2	5	Study of Waterproofing treatment of a. Toilet, b. Bathroom, c. Sunk area of Water closet block, d. Chajjas and terrace, e. Basement, f. Underground reservoirs water tank.	4	CO5
3	7	Site Visit on Different Techniques of Repair of building structure.	2	CO3
4	2	NDT on Two or three structural element of the building.	2	CO2
* Minimum 8 and maximum 13 practical/experiment sessions to be included in a course in a term				

Termwork:

Termwork shall consist record of all Practical and MiniProject in the journal.

Learning Resources:

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	M.S.Shetty,	Concrete Technology-Theory and Practice	Revised edition 2005, Publisher S.Chand and Company New Delhi.
2	M.K.Lakhani	Water Proofing technology Theory and Practice	1st Edition Nov 2003, Publisher Lakhani Enterprise.
3	B. S. Nayak	Maintenance Engineering. for Civil Engineers	Khanna Publisher
4	Sushil Kumar	Building Construction	Standard Publisher
5	P. K. Guha	Maintenance and Repairs of Buildings	New Central Book Agency
6	Ivor H.Seeley	Building Maintenance	Volume 2, 1976 Publisher The MacMillan Press Ltd London

Reference Books:

Sr. No.	Author	Title	Publisher and Edition
1	Lakshmipathy	Estate Management –Metal Lecture Notes of Workshop on "Repairs and Rehabilitation of Structures"	29-30 October 1999.Publisher Anna Institute of Management. N. Palaniappan, Chennai 1992.
2	Dennison Campbell, Allen And Harold Roper,	Concrete Structures-Materials, Maintenance and Repairs	Longman Scientific and Technical U.K,1991.
3	MrR.N.Raikar	Learning from Failures – Deficiencies in Design	Construction and Service R & D Centre (SDCPL) RaikarBhavan, Mumbai, 1987
4	Shild, Oswald	Structural Failure in Residential Building	Volume 2, 1979 Granada Publishing, New York.

SUGGESTED SPECIFICATION TABLE WITH HOURS (Theory)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Operation, Maintenance,Repair	02	40%	60%	0	04
II	Defects in Building	05	40%	40%	20%	12
III	Condition Survey & Non Destructive Testing	07	20%	40%	40%	10
IV	Materials for Repairs	10	20%	40%	40%	14
V	Water ProofingTechnology	11	20%	40%	40%	08
VI	Maintenance of Building:	04	40%	40%	20%	16
VII	Techniques for Repairs:	09	40%	40%	20%	16
		48				80

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

Curriculum Coordinator   Head   Dean - Diploma

Diploma in Civil Engg.

DIPLOMA PROGRAMME	: DIPLOMA IN CIVILENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FOURTH
COURSE TITLE	: THEORY OF STRUCTURES.
COURSE CODE	: 171SE44

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		MST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	2	-	5	3	80	32	20	100	40	-	-	25**	10	25@	10	150

@- Assessment by Internal Examiner, **: Assessment by External and Internal Examiner

Course Objectives:

Mechanics of Structures provides prerequisites for design of Structures. This subject provides students knowledge to identify simple/ determinate subjects from practical – indeterminate subjects and their analysis. Deflection calculations is the base of analysis of an indeterminate structures which is therefore also covered in this subject.by some of the stiffness and flexibility methods. Prerequisite of design of axial force steel members is also covered here in the analysis of roof trusses.

Course Outcomes:

Student should be able to

CO1	Calculate slopes and deflections of various types of beams.
CO2	Classify beams and trusses as unstable, stable, determinate and indeterminate. Calculate degree of static indeterminacy of indeterminate structures.
CO3	Analyze determinate pin joint frames (Roof trusses). Analyze Indeterminate beams like propped cantilevers and continuous beams by some of the flexibility and stiffness methods.

Course Content:

SECTION-I								
Unit &Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	% R Level	% U Level	% A Level
1	1.1	**Deflection of Beams:** Double integration method with Macaulay's Techniques - Application to simply supported beams, cantilever and over hanging beams.	10	16	1	15	42	43
2	2.1	**Static Indeterminacy of structures:** Type of structures occurring in practice and their classification mainly	04	06	2	50	25	25

		astatically determinate and Indeterminate structures. Degree of Indeterminacy for Indeterminate Structures						
	2.2	Stable andunstable structures, especially beams and trusses. Beams with Internal Hinge(s).						
3	3.1	**AnalysisofFixed Beams and other indeterminate structures**: Theorem of superposition, Method ofconsistent deformation and its application to proppedcantilevers and fixed beams	10	18	3	10	42	43
	3.2	Application to simple continuous beams with and without overhang.						
		TOTAL OF SECTION I	**24**	**40**				

SECTION-II

Unit &Sub-Unit		Topics/Sub-topics						
4	4.1	**Theorem of Three Moments-(Clapeyron's Theorem)**: Application to propped cantilevers, fixed beams and continuous beams.	8	14	3	15	42	43
5	5.1	**MomentDistributionMethod**: Rotational Stiffness of Member, Carryover factor, Distribution factor, Distribution Theorem	8	13	3	20	40	40
	5.2	Application to Propped Cantilevers and Continuous Beams.						
6		**Plane Truss (Simple Frames)**: Various types of trusses, calculations of support reactions. Forces in the members of plane truss using method of joints and method of Sections .Graphical analysis of truss analysis.	8	13	3	15	42	43
		TOTAL OF SECTION II	**24**	**40**				
		TOTAL OF SECTION I and II	**48**	**80**				

Numerical Problems will be asked in the examination, based on above syllabus.

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

Unit	Hours	Marks	CO	% R Level	% U Level	% A Level
1	10	16	1	15	42	43
2	04	06	2	50	25	25
3	10	18	3	10	42	43
4	08	14	3	15	42	43
5	08	13	3	20	40	40
6	8	13	3	15	42	43

Term Work:

Tutorial consisting of minimum 5numerical on all of the topics as follows:

Unit &Sub-Unit	Topics/Sub-topics	Hours	CO
01	Slope and deflection calculations by Double Integration Method.	6	2
02	Static Indeterminacy of structures	5	5
03	Analysis of indeterminate structures: Methods of consistent deformation for propped cantilevers and fixed beams.	5	3
04	Analysis of indeterminate structures: Numericals on Theorem of three Moments.	5	3
05	Numericals on Moment Distribution Method and its application to continuous beams.	5	3
06	Numericals and graphical solutions of simple roof trusses	6	3

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	S. Ramamrutham	Theory of Structures.	8th EditionReprint2008,Publisher:DhanpatRai and Sons.
2	S. B. Junnarkar	Mechanics of structures	21st Edition 2010,Charotar Publishing. House

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	V.N. Vazirani & M.M.Ratwani.	Analysis of structures Vol II	Edition 2003, Khanna Publishers.

2	C.S.Reddy.	BasicStructural Analysis.	2nd Edition,16thReprint2007,McGraw-Hill
3	Web site	http://nptel.ac.in/courses	IITs

Curriculum Coordinator

**Head
Diploma in Civil Engg.**

Dean - Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FOURTH
COURSE TITLE	: HYDRAULICS
COURSE CODE	: 171CE45

Teaching & Examination Scheme

TEACHING SCHEME				PAPER HRS	EXAMINATION SCHEME													TOTAL MARKS
					TH		MST	TOTAL		PR		OR		TW				
L	T	P	CR		Max	Min		Max	Min	Max	Min	Max	Min	Max	Min			
3	-	2	5	3	80	32	20	100	40	-	-	-	-	25@	10			125

@: assessment by Internal Examiner

Course Objective:

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.

Course Outcomes:

Student should be able to

CO1	Relate the fundamental principles of hydraulics for the measurement of different hydraulic parameter
CO2	Measure the pressure and quantity of flow of water in different condition using various pressure measuring devices.
CO3	Compute discharge and losses occurs for fluid flow through pipes and channels
C04	Identify the different hydraulic machines

Course Content:

Unit	Sub unit	Topics/Subtopics	HRS	Marks	CO	R Level	U Level	A Level
		Section I						
1		Properties Of Fluid	5	06	1	30%	50%	20%
	1.1	Definition of fluid, Introduction to fluid mechanics and Hydraulics. Types of Fluid.						
	1.2	Importance of Hydraulics with respect to Irrigation and Environmental engineering.						
	1.3	Physical properties of fluid - Mass density, Weight density, Specific volume, Specific gravity, Surface tension and capillarity, Compressibility, Viscosity, Newton's law of viscosity ,Measurement of Viscosity using Viscometer						
	1.4	Numerical problem based on it						
2		Pressure and its measurement	11	16	1,2	40%	30%	30%
	2.1	Definition of pressure and its SI unit, Compressible and Incompressible fluid Hydrostatic pressure at point- Pascal's law, Variation of pressure in static liquid. Pressure Diagram Numerical problems based on it.						
	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 faces of dams, sides and bottom of water tanks sides and bottom of tanks containing two liquids. Vertical surface in contact with liquid on either side. Numerical problems.						
	2.3	Absolute, gauge, atmospheric & vacuum pressure, measurement of pressure- manometers and mechanical gauges.						

		Numerical on Piezometer and U tube manometer.					
3		Fundamentals Of Fluid Flow-I	8	18	2	40%	30%	30%
	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, Stream line and equi-potential line. Flow net and its use						
	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 statement, assumptions, equation .Loss of energy						
		Total of section I	**24**	**40**			
		Section II						
4		Fundamentals Of Fluid Flow-II	07	10	3	20%	30%	50%
	4.1	Venturimeter, orifice meter, nozzle meter and their Comparison. Classification of orifices, Flow through an orifice,						
	4.2	Hydraulic coefficients: coefficient of velocity, coefficient of contraction, coefficient of discharge, Classification of mouthpieces. Numerical Problems.						
5.		Flow through pipes:	10	16	3	40%	30%	30%
	5.1	Pipes and Pipe line. Loss of Head in pipe line 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.						
	5.2	Hydraulics gradient & total energy line and its application in pipeline, flow through						

		pipes in series, Compound pipe equivalent pipe, flow through parallel pipes, Flow through branched pipes. Syphon and its uses. Numerical Problems.					
	5.3	Water Hammer, Surge tank :Principle, Causes , effects and types of Surge tank					
6		Flow in open channels	7	14	3,4	20%	50%	30%
	6.1	Classification of flow in channels- steady & unsteady flow, uniform & non uniform flow, laminar & turbulent flow, sub-critical, critical & supercritical flow.					
	6.2	Discharge through open channel by Chezy's formula, most economical rectangular channel section. Numerical Problems.					
	6.3	Classification of notches & weirs, discharge over rectangular notch or weir, discharge over triangular notch or weir. Numerical Problems.					
	6.4	Introduction to Pumps and Turbines					
		Total of section II	**24**	**40**			
		Total of section I & II	**48**	**80**			

Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms' Revised Taxonomy).

List of Practicals/Assignments/Tutorials:

Sr. No.	Unit	Practicals	Approx. Hours	CO
1	2	Pressure measuring device	04	CO2
2	2	Hydrostatics Law	02	CO1
3	3	Bernoulli's theorem	02	CO1
4	3	Measurement of Discharge using measuring tank/Can	02	CO3
5	4	Flowmeter	06	CO2

6	4	Calibration of Orifice	02	CO2
7	5	Flow Visualization -Reynold Apparatus.	02	CO2
8	5	Major Loss in the pipe	02	CO3
9	5	Minor losses in pipes (any two)	02	CO3
10	6	Uniform Flow	04	CO3
11	6	Notches	04	CO3
12	6	Study of Pump/Turbine	02	CO4
13	3	Digital Water Level Indicator	02	CO1

*Minimum 8 and maximum 13 practical / experiment sessions to be included in a course in a term

Term work:

Term work shall consist record of all Practical's.

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Dr. P. N. Modi & Dr. S. M. Seth,	A Text Book of Hydraulics & Fluids Mechanics	Standard Book House, New Delhi. Edition 17th 2009,
2	R. K. Rajput,	A Text Book of Fluids Mechanics & Hydraulics	Edition 2nd reprint 2004 Publisher S. Chand & Company Ltd. New Delhi

Reference books:

Sr. No.	Author	Title	Publisher and Edition
1	Dr. R .K. Bansal	Fluid Mechanics and Hydraulic Machines	Edition 9th 2005 Publisher-Laxmi Publications Pvt. Ltd., New Delhi.
2	S. K. Likhi	Hydraulics Laboratory Manual	T.T.T.I. Chandhigrah.

SUGGESTED SPECIFICATION TABLE WITH HOURS (Theory)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Properties Of Fluid	5	30%	50%	20%	6
II	Pressure and its measurement	11	40%	30%	30%	16
III	Fundamentals Of Fluid Flow-I	8	40%	30%	30%	18
IV	Fundamentals Of Fluid Flow-I	7	20%	30%	50%	10
V	Flow through pipes	10	40%	30%	30%	16
VI	Flow in open channels	7	20%	50%	30%	14
		48				80

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)*Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.*

Curriculum Coordinator   **Head**   **Dean - Diploma**

Diploma in Civil Engg

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FOURTH
COURSE TITLE	: COMPUTER AIDED DRAWING
COURSE CODE	: 171CE46

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME												
L	T	P	CR	PAPER HRS	TH		MST	TOTAL		PR		OR		TW		TOTAL MARKS
					Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
0	0	3	3							25**	10			25@	10	50

**:assessment by External and Internal Examiner @: assessment by Internal Examiner

Course Objectives:

This course provides students with a broad introduction into 2-dimensional and 3-dimensional Computer-Aided Design (CAD). The main objective of the course is to develop 2D civil engineering drawings of building and 3D drawings of simple objects.

Course Outcomes:

Student should be able to

CO1	Setup CAD workstation and demonstrate basic commands of CAD Software
CO2	Apply basic CAD command to develop 2D drawings of residential building using CAD software
CO3	Apply basic CAD command to develop 3D drawings of residential building using CAD software

Course Content:

Unit & Sub-Unit		Topics/Sub-topics
1		Introduction to CAD
	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, Libre CAD 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		Demonstration of commands in CAD
	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		Developing 2D drawings of Buildings and Culvert/ Bridge					
	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. Print/Plot the drawings using Plot setting.					
	3.3	Drawing a detailed Plan, elevation, section for residential/ commercial building along with site plan, Area statement & Name plate. Print/Plot the drawings using Plot setting.					
	3.4	Drawing of Culvert/ Bridge					
4		Developing 3D drawings of objects					
	4.1	Develop isometric drawings of Simple Objects such as Steps, Footings etc. Print/ Plot the above drawings using Plot Settings					
	4.2	Develop a 3D Model for a Single Room Building					

List of Practicals

Sr. No.	Unit	Practical/Assignment/ Project	Approx. Hours	C O	R Level	U Level	A Level
1	1	Introduction of the user interface, Usage of various CAD commands.	6	1	30%	40%	30%
2	2	Draw a basic 2D objects	6	2	10%	10%	80%
3	2	Draw a line plan for residential building	3	2	10%	10%	80%
4	3	Draw following drawing for a residential bungalow 1.Plan 2.Elevation 3.Section 4.Site plan 5. Area Statement and Schedule 6. Title Block	9	2	10%	10%	80%
5	3	Draw following drawing for a G+2 residential/ commercial building 1.Plan 2.Elevation 3.Section 4.Site plan	9	2	10%	10%	80%

		5. Area Statement and Schedule 6. Title Block					
6	3	Draw a Plan, Cross section & longitudinal section of a Culvert (Pipe/ Box Culvert) or a Concrete bridge	6	2	10%	10%	80%
7	4	Develop isometric drawings of simple objects such as steps, footings etc.	3	3	10%	10%	80%
8	4	Develop a 3D model for a single room building	6	3	10%	10%	80%

Term work:

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

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Dr M.A.Jayaram, D.S.Rajendra Prasad	CAD in Civil Engineering a Laboratory Referral	Sapna Book House
2	-	AutoCAD Manual	Microsoft AutoDesk
3	Sham Tickoo	AutoCAD – A problem solving Approach – 2013 & Beyond	Cengage Learning; 1st edition (September 21, 2012)
4	M. N. Sesha Praksh & Dr. G. S. Servesh	Computer Aided Design Laboratory	Laxmi Publications.

Web sites:

1. www.cadlearning.com

2. www.cadopolis.com/autocad-tutor.html

Curriculum Coordinator

Head
Diploma in Civil Engg.

Dean - Diploma

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FOURTH
COURSE TITLE	: TOWN PLANNING
COURSE CODE	: 171CE47

TEACHING AND EXAMINATION SCHEME:

TEACHING SCHEME				EXAMINATION SCHEME													
				PAPER HRS	TH		MST	TOTAL		PR		OR		TW		TOTAL MARKS
L	T	P	CR		Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
2	-	2	4									25**	10	25@	10	50

**: assessment by External and Internal Examiner, @: assessment by Internal Examiner

Course Objectives:

Town Planning is a technical and political process concerned with the development and use of land, planning permission, protection and use of the environment, public welfare, and the design of the urban environment, including air, water, and the infrastructure passing into and out of urban areas, such as transportation, communications, and distribution networks. The study of Town Planning involves both control of existing and new development, and "strategic planning" to ensure our resources are carefully managed to match our future needs and expectations.

Course Outcomes:

Student should be able to

CO1	Understand the history of Planning.
CO2	List the objectives of planning and the relationship of Environment with planning.
CO3	Interpret various development plans
CO4	Understand the basic ecological processes in relation to planning.
CO5	Execute modern and contemporary theories of Planning.

Course Content:

Unit & Sub-Unit		Topics/Sub-topics	Hours	CO	R Level	U Level	A Level
1		**History of Indian Town Planning**	02	1	30%	40%	30%
	1.1	Settlements in prehistoric, Vedic, Harappan (Dholavira, Lothal, Surkotada, Banawali, Kalibangan, Mohen Jo Daro etc.)					

	Unit & Sub-Unit	Topics/Sub-topics					
		Settlements and their physical forms during various dynasties up to 18th century and during colonization (Case studies - Jaipur, New Delhi etc.), Town planning after independence (Case studies - Chandigarh, Gandhinagar etc.					
2	2.1	**Terms and Rationales of Town Planning** Various definitions of town and country planning;	06	2 & 3	60%	20%	20%
	2.2	Goals and objectives of planning; Components of planning; Benefits of planning.					
	2.3	Levels of planning: Regional plan, Development Plan, Town Planning Scheme.					
	2.4	Role of "Urban Planner" in planning and designing in relation with spatial organization, utility, demand of the area and supply					
3		**Development Plans and Development Regulations**	08	3	40%	30%	30%
	3.1	Definition of development plan; Types of development plans: master plan, city development plan, structure plan, district plan, action area plan, subject plan, town planning scheme, regional plan, sub-regional plan;					
	3.2	types of development control; Implications of violations of development control regulations; Conforming and Nonconforming land uses; LULU and NIMBY					
4		**Civic Surveys for DP**	04	5	20%	20%	60%
	4.1	Various types of civic surveys for DP : demographic, housing, land use, Water Supply & sanitation, etc.,					
	4.2	Planning agencies for various levels of planning. Their organization and purpose (CIDCO-MHADA-MIDC, MMRDA/ PMRDA etc).					
	4.3	Traffic transportation systems: urban road, hierarchy, traffic management, Intelligent Transport Systems.					
	Unit & Sub-Unit	**Topics/Sub-topics**					
5		**Environmental concerns in town planning**	04	4	30%	30%	40%
	5.1	Traffic, garbage, sewage, water supply,					

		residential, industrial and commercial zones, etc. Environmentally compatible regional development,					
	5.2	Environmental impact assessment and its importance in planning.					
6		**Legislative mechanism for preparation of DP:**	06	5	30%	20%	50%
	6.1	MRTP Act 1966, UDPFI guidelines (for land use, infrastructure etc), SEZ, CRZ, Smart City Guidelines					
	6.2	Special townships, Land Acquisition Rehabilitation and Resettlement Act 2013.					
	6.3	Application of GIS, GPS, remote sensing in planning.					
7	7.1	**City Development** Compact city approach: concept, advantages and limitations; Forms of cities in developing world	02	5	20%	35%	45%
		TOTAL	32				

Notes: This specification table shall be treated as a general guideline and actual distribution of marks may slightly vary from table. But the questions from each topic should be asked as per marks weightage. Numerical questions are to be asked only if specified.

List of Practicals/Assignments/Tutorials:

Sr. No.	Practical/Assignment	Approx. Hours	CO
1	Study of Development Plan with respect to land use, services, infrastructure, street furniture, housing etc. (group work)	10	2, 3 & 4
2	Report on contribution of Engineers, Planners and Architects in post independence India (individual work)	4	1 & 5
3	Report including drawing of any existing new towns and planned towns like new Mumbai, Gandhinagar, PCNTDA etc.(infrastructure, disaster management etc), (individual work)	4	1, 2, 3, 4 & 5
4	Smart City approaches (individual work)	8	4 & 5
5	Study of urban housing and housing change (group work)	6	1, 2, 3, 4 & 5

Term work: - Students shall submit report / term work journal based on above topic.

Text Books:

Sr. No.	Author	Title	Publisher and Edition
1	Abir Bandopadhyaya	Text Book of Town Planning	Books & Allied Ltd (2000)
2	G K Hiraskar	Town Planning	Dhanpat Rai Publications (2012)
3	Rangwala	Town Planning	Charotar Book Distributors (1 January 2015)

Reference books and Websites:

Sr. No.	Author	Title	Publisher and Edition
1	MoUD By GoI	MRTP Act 1966, LARR Act 2013 and UDPFI Guidelines	
2	Govt of Maharashtra	CIDCO, MHADA, MIDC, MMRDA, PMRDA	
3	F. S. Hudson	Geography of Settlements	Evans Ltd. Estover, Plymouth PL 6 7 PZ UK
4	Koenigsbeger	Manual Of Tropical Housing And Building	
5	Biswas Hiranmay	Principles Of Town Planning And Architecture	VAYU Education of India (2012)
6	Peter Hall	Urban and Regional Planning	

Curriculum Coordinator

Head
Diploma in Civil Engg.

Dean - Diploma