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

(Central Technological Institute,Maharashtra State,INDIA)
H.R.Mahajani Marg, Matunga, Mumbai - 400019
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Programme Name:Diploma inCivil Engineering

Programme Code	**:DCE**	**With Effect From Academic Year**	**: 2023-24**
Duration of Programme	**: 6Semester**	**Duration**	**: 16WEEKS**
Semester	**: Fifth**	**Scheme**	**: R-2023**

SrNo	Course Title	Abbre-viation	Course Type	Course Code	Total IKS Hrsfor Sem.	LearningScheme					Credits	AssessmentScheme												Total Marks
						Actual Contact Hrs./Week			Self-Learning (Term Work + Assignm-ent)	Notional Learning Hours /Week		Paper Duration (Hrs.)	Theory					Based on LL &TL Practical				Based on Self Learning SLA		
						CL	TL	LL					FA-TH (MST) Max	SA-TH (ESE) Max	SA-TH (ESE) Min	Total Max	Total Min	FA-PR (CA) Max	FA-PR (CA) Min	SA-PR Max	SA-PR Min	SLA Max	SLA Min	
1	INDUSTRIAL TRAINING	IDT	INP	231CE51						8	4							100	40	100#	40			200
2	WATER RESOURCES ENGINEERING	WRE	DSC	231CE52	1	3	2	-	2	7	3.5	3	30	70	28	100	40	25	10			25	10	150
3	WATER SUPPLY AND WASTEWATER DISPOSAL	WSW	DSC	231CE53	2	3	-	2	-	5	2.5	3	30	70	28	100	40	25	10	25@	10			150
4	ADVANCED CONSTRUCTION TECHNIQUES	ACT	AEC	231CE54	2	3	2	-		5	2.5	3	30	70	28	100	40	25	10					125
5	REINFORCED CEMENT CONCRETE	RCC	DSC	231SE55	1	3	2	-		5	2.5	3	30	70	28	100	40	25	10					125
6	ELECTIVE I	EL1	DSE	231CE56E	1	3	2	-		5	2.5	3	30	70	28	100	40	25	10					125
7	CIVIL ENGINEERING SOFTWARE	CES	SEC	231CE57	-			2	1	3	1.5							25	10	25#	10	25	10	75
8	PROJECT-I	PR1	INP	231CE58				6		6	3							50	20	50#	20			100
Total						**15**	**8**	**10**	**3**	**44**	**22**					**500**		**300**		**200**		**50**		**1050**

Abbreviations:CL-Classroom Learning,TL-TutorialLearning,LL-Laboratory Learning,FA – Formative Assessment,SA-Summative Assessment, IKS- Indian Knowledge System,SLA - Self Learning Assessment
Legends:@Internal Assessment,#External Assessment, *#Online Examination,@$Internal Online Examination * 8 weeks industrial training after 4th Semester. Evaluation of Training and report will be done in 5th semester and the credits for the same will be included in 5thsemester marksheet. The teaching load assigned to a faculty for guiding students in the preparation of training reports and its evaluation for a batch of students (equivalents to practical batch size) would be 1 hour/week in 5th Semester.
Course Category: DisciplineSpecificCourseCore(DSC) :3 ,DisciplineSpecific Elective(DSE) :1, ValueEducationCourse(VEC) :0, Intern./Apprentice./Project./Community(INP) :2, Ability Enhancement Course (AEC) : 1, Skill Enhancement Course (SEC) : 1, Generic Elective (GE) : 0

Curriculum Coordinator **Head** **Dean-Diploma**
Diploma in Civil Engineering

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE DIP EXAM MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	**DIPLOMA IN CIVIL ENGINEERING**
PROGRAMME CODE	**: DCE**
SEMESTER	**: FIFTH**
COURSE TITLE	**: INDUSTRIAL TRAINING**
COURSE CODE	**: 231CE51**

I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
-	-	-	-	4	-	-	-	-	-	-	100	40	100	40	-	-	200

II. RATIONALE

The industry training is aimed to impart employable skills in the respective field to get a job/employment. Students are expected to learn the work practice and environment of the respective industry and develop a report. On the basis of this report the institute departments will evaluate the student performance.

III. COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

- CO1 - Gain hands-on experience in applying theoretical concepts to real-world tasks, improving their understandi and problem-solving abilities and readiness for the workforce.
- CO2 - Boosts students' self-confidence and encourages them to pursue ambitious career goals. to earn a livelihood a better status in society.
- CO3 - Interact with industry professionals during training to build valuable connections for job opportunities.

IV. GENERAL GUIDELINES FOR ORGANISING INDUSTRIAL TRAINING

The Industry/organization selected for Industrial training/ internships shall be Government / Public Limited/ Private limited / Startup /Centre of Excellence/Skill Centers/Skill Parks etc.

a) Duration of Training - 8 weeks students engagement time (Min. 28-30 hrs./week)
b) Period of Time slot - After 4th Semester

c) Industry area - Engineering Programme Allied industries of large, medium or small-scale, Organization / Govt. / Semi Govt Sectors.

Role(s) of Training and Placement Office (TPO)- Diploma Programs at the Institute:

The TPO - Diploma Programs shall be responsible for placing the student for industrial training which shall be a Government / Public Limited/ Private limited / Startup /Centre of Excellence/Skill Centers/Skill Parks etc.

Role(s) of the respective Heads of Department- Diploma / / Industrial Training Supervisor(s):

1. Concerned **Head of Department - Diploma** shall appoint a Faculty Industrial Training Coordinator, who can be a permanent / ad-hoc / contractual faculty of the respective department in their departmental faculty meetings before the start of the Mid semester Test for Fourth Semester.
   Heads of Department - Diploma shall send the decided names of the Departmental Faculty Industrial Training Coordinator to the TPO - Diploma Programs before the start of the Mid Semester Test of the Fourth Semester.

2. The **Faculty Industrial Training Coordinator shall** coordinate with the TPO- Diploma Programs and ensure that all the students of their respective departments are placed by the TPO - Diploma Programs. He/She shall allocate Faculty supervisors to all the students undergoing Industrial Training in their respective departments in consultation with the Diploma Head of Department.

   Before the scheduled date as decided by the Diploma Exam Section they shall collect and compile the marks received from the respective Faculty Supervisors for all the students that have undergone the Industrial Training that semester.

   The marks shall be submitted to the Diploma Exam Section and the required entries made in the software as per the regular instructions from the Diploma Exam Section. A self signed copy of the final compiled marksheet shall be submitted to the TPO - Diploma Programs and the Diploma Head of Department for records.

3. **Faculty Supervisors** shall coordinate with the allocated industry/organisation and monitor the attendance and progress of the students allocated to them. They shall acquire the undertaking from Parents/Guardians(Format 1) and Student(Format 2). They shall ensure to maintain all records like Internship Diary of each student and complete the evaluation for the students allocated to them in consultation with the **Faculty Industrial Training Coordinator and the Diploma Head of Department**. Maintain the final report submitted by the students at the end of their evaluation. They shall submit the marks to the respective **Departmental Faculty Industrial Training Coordinator.**

Role(s) and Responsibilities of students:

a) Students shall interact with the **Faculty Supervisors** allocated to them for suggestions on Industrial Training choices of suitable industry, if any. If students have any contact in industry through their parents or relatives then the same may be utilized for securing placement for themselves and their peers through proper documentation through their Faculty Supervisors and TPO Diploma Programs.
b) Students have to obtain the forms/formats duly signed by institutional authorities along with a training letter and submit it to the training officer/mentor in the industry on the first day of training.
c) Students must submit the undertaking as provided in Format 1 and Format 2 to their faculty Supervisors.
d) Students must carry with him/her Identity card issued by the institute during the training period.
e) Students should follow industrial dressing protocols, if any. In absence of specific protocol students must wear appropriate uniform compulsorily as required by the industry.
f) Students will have to get all necessary information from the training officer/mentor at industry regarding schedule of training, rules and regulation of the industry and safety norms to be followed. Students are expected to observe these rules, regulations and procedures strictly.
g) Students must be fully aware that if they disobey any rule of industry or do not follow the discipline then non-disciplinary action will be taken.
h) Students must maintain a weekly diary (Format 3) by noting daily activities undertaken and get it duly signed from Industry mentor or Industrial training in charge.
i) In case students face any major problems in industry such as an accident or any disciplinary issue then they should immediately report the same to their Faculty Supervisor.
j) Prepare a final report about the training for submission to the department at the time of evaluation, presentation and viva-voce etc. and get it signed by the Faculty Supervisor, Departmental Faculty Industrial Training Coordinator and Diploma Head of Department.

Typographical guidelines for Industry Training report:

Following is the suggestive format for preparing the training report.Actual report may differ slightly depending upon the nature of industry. The training report may contain the following
a) The training report shall be computer typed (English-British) and printed on A4 size paper.
b) Text Font -Times New Roman (TNR), Size-12 point
c) Subsection heading TNR- 12 point bold normal
d) Section heading TNR- 12 capital bold
e) Chapter Name/ Topic Name – TNR- 14 Capital
f) All text should be justified. (Settings in the Paragraph)
g) The report must be typed with 1.5 spacing with a margin 3.5 cm on the left, 2.5 cm on the top, and 1.25 cm on the right and at bottom.
h) The training report must be Spiralbound. The name of the candidate, diploma (department), year of submission, name of the institute shall be printed on the cover [Refer sample sheet (outer cover)]
i) The training report, the title page should be given first then the Certificate followed by the acknowledgment and then contents with page numbers.

Suggestive format of industrial training report:

Following format may be used for training reports. Actual format may differ slightly depending

upon the nature of Industry/ Organization.

- Title Page Certificate Abstract
- Acknowledgement
- Content Page

Chapter 1

Organization structure of Industry and general layout.

Chapter 2

Introduction to Industry / Organization (history, type of products and services, turn over and number of employees etc.)

Chapter 3

Types of Major Equipments/raw materials/ instruments/machines/ hardware/software used in industry with their specifications, approximate cost, specific use and routine maintenance done

Chapter 4

Processes/ Manufacturing Manufacturing techniques and methodologies and material handling procedures

Chapter 5

Testing of Hardware/Software/ Raw materials/ Major material handling product (lifts, cranes, slings, pulleys, jacks, conveyor belts etc.) and material handling procedures.

Chapter 6

Safety procedures followed and safety gears used by industry.

Chapter 7

Particulars of Practical Experiences in Industry/Organization if any in Production/Assembly/Testing/Maintenance

Chapter 8

Detailed report of the tasks undertaken (during the training).

Chapter 9

Special/challenging experiences encountered during training if any.

Chapter 10

Conclusion

Chapter 11

References / sources of information

NOTE: The above Format is only a guideline and the Chapters may change as per the Industry and Department of Training received.

Format-1
Consent Letter from parents/guardians
(Undertaking from Parents)

To,
The Diploma Head of Department,

_____.

Subject: Consent for Industrial Training

Sir/Madam,
I am fully aware that -

1. My ward studying in _____semester at your institute has to undergo _____weeks of

   Industrial training for partial fulfillment towards completion of Diploma in Engineering.

2. For this fulfillment he/she has been deputed at _____industry,

   located at _____ for

   Industrial training /Internship for the period from_____ to _____.

   With respect to above I give my full consent for my ward to travel to and from the mentioned industry. Further I undertake that –

1. My ward will undergo the training at his/her own cost and risk during training and/or stay during the period of training.
2. My ward will be entirely under the discipline of the organization where he/she will be placed and will abide by the rules and regulations in face of the above mentioned industry.
3. My ward is NOT entitled to any leave during the training period.
4. My ward will regularly submit a prescribed weekly diary, duly filled and countersigned by the training supervisor of the industry to the faculty supervisor of the department.

I have explained the contents of the letter to my ward,who has also promised to adhere strictly to the requirements. I assure that my ward has been properly instructed by me to take his own care to avoid any accidents / injuries in the industry. In case of any accident neither industry nor the institute will be held responsible.

Signature of Parent/Guardian :_____ Signature of the student: _____

Name : _____ Name of the Student: _____

Address : _____ Registration No: _____

Phone Number:_____ Phone Number of student: _____

Place and Date : _____

Format-2

Undertaking by the Student

To,
The Diploma Head of Department,

_____Department.

Subject: Undertaking regarding Placement for Industrial training of 8 weeks duration

I _____Registration No_____S/o/D/o_____

studying in _____ Department at Veermata jijabai Technological Institute am fully aware of the Industrial Training requirements and related responsibilities and participation in the Industrial training at _____ (Industry Name and Place).

From: _____To_____

I assure you that I will be of good behavior and be obedient to the staff and mentor during the training period mentioned above. I will also abide by and will not participate in irresponsible activities. I will also discipline myself within the rules and regulations of the Institution. I am also aware that I am participating in the Industrial Training at my own risk and I will not hold Veermata Jijabai Technological Institute responsible in any way in any eventuality namely Accident /Injury/death or whatever mishap and I myself will be solely responsible for my safety.

Place : _____ Signature of the student: _____

Date : _____

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE
DIP EXAM
MATUNGA
MUMBAI-19

Format 3

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE

[Central Technological Institute, Maharashtra state]

Matunga, Mumbai-400019

DIARY

Industrial Training and Internship

DEPARTMENT OF _____ ENGINEERING

Year: _____

Name of Industry: _____

Address: _____

Contact No. of Industry Mentor _____

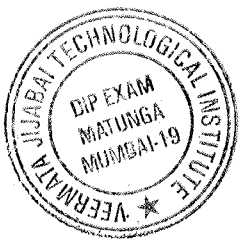
Name of the Student: _____ Registration No. _____

WEEK NO. ___

Date	Details of Work Allotted	Sign of Industry Mentor

Institute Faculty Supervisor's Name: _____

Signature:_____



V. ASSESSMENTS METHODOLOGIES /TOOLS

1. Formative assessment (Assessment for Learning)

   Academic year : 20___-20___

   Name of the industry: _____

   Marks : Max 100, Min 40

   Based on the following:

   - Weekly reports of the Internship Diary in the given format to the Faculty Supervisors (Marks:).
   - Behaviour at the Industry (Marks:).
   - Feedback from the Industry Mentor (Marks:).

   Name of mentor : _____

   Signature of Mentor : _____

2. Summative Assessment (Assessment of Learning)

   Academic year : 20___-20___

   Name of the industry: _____

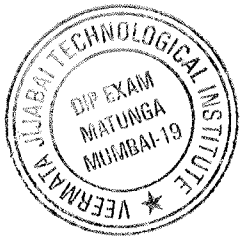
   Marks : Max 100, Min 40

Sr No	Registration No	Name of the Student	Observations from Orals/Presentations				Total Marks Obtained Out of 100
			Knowledge about Industry & Departments (Marks:)	Knowledge of Layout/M/C Specifications / Components etc (Marks:)	Skill Developed Presentation / Discipline etc. (Marks:)	Submitted Report (Marks:)	

Name of mentor : _____

Signature of Mentor : _____

VI. SUGGESTED COS-POS MATRIX FORM



VI. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO1	PSO2	PSO3	PSO4
CO1	3	3	2	2	1	3	3	2	1	2	2
CO2	2	2	2	2	2	2	3	2	2	2	2
CO3	2	2	2	2	2	2	3	2	2	3	3
Legends :- High:03, Medium:02,Low:01, No Mapping: -											

Curriculum Coordinator Head of the Department Dean Diploma

BOS VJTI Approval Dt. 23/05/2025

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE
DIP EXAM
MATUNGA
MUMBAI-19

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FIFTH
COURSE TITLE	: WATER RESOURCES ENGINEERING
COURSE CODE	: 231CE52

I. LEARNING AND ASSESSMENT SCHEME:

TEACHING SCHEME						EXAMINATION SCHEME											
CL	TL	LL	Self-learning	CR	Paper HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	2	-	2	3.5	3	30	70	28	100	40	25	10	-	-	25	10	150

II. COURSE OBJECTIVES:

Irrigation is an age-old art. The aim of the subject is to present the science and practice of irrigation engineering in a concise form comprising practically all the modern development.

III. COURSE OUTCOMES (COs)

Students will be able to achieve the following COS on completion of course based learning

CO1	Take up the basic concepts of irrigation and construction of various hydraulic structures.
CO2	Evaluate water requirements of crops, runoff, yield from catchments and canal capacity.
CO3	Decide the type and section of Dams
CO4	Recognize types of watershed management techniques and structures constructed in farms.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I							
Unit & Sub-Unit	**Topics/Sub-topics**	**Hours**	**Marks**	**COs**	**R Level**	**U Level**	**A Level**
1	**Introduction**	**03**	**05**	**1**	**60%**	**40%**	**-**
1.1	Definition – Irrigation and irrigation engineering, necessity of irrigation, advantages of irrigation, ill effects of over irrigation and types of irrigation.						
1.2	Introduction to lift irrigation scheme.						
1.3	Irrigation department design standards and specifications.						
2	**Water Requirement of Crops**	**05**	**08**	**2**	**30%**	**50%**	**20%**
2.1	Principle Indian crops, Cropping seasons.						
2.2	Definitions – Crop period, base period, Duty & Delta, factors affecting Duty, relation between Duty, Delta and base period.						
2.3	Definition – CCA, GCA, Intensity of irrigation, time factor, Kor Period, Kor depth, outlet factor.						
2.4	Modified Penman method and Problems on water requirement and capacity of canal.						
3	**Dams and Spillways**	**16**	**22**	**3**	**30%**	**40%**	**30%**
3.1	Survey for irrigation project- Data to be collected for irrigation project: site selection for dams, reservoir and spillways.						

3.2	Types of dams – Earthen dams and Gravity dams (masonry and concrete), Comparison of earthen and gravity dams with respect to foundation, seepage, construction and maintenance.						
3.3	Earthen Dams – Components and their functions, Types of earthen dams, seepage through embankment and foundation, seepage control though embankment and foundation. Types of failure of earthen dams and remedial measures.						
3.4	Gravity Dams- Typical cross section, drainage gallery, joints in gravity dam, Concept of high dam and low dam, forces acting on dam.						
3.5	Spillways- Definition, function, location and components, various types.						
	Total of Section I	**24**	**35**				

SECTION - II							
Unit & Sub-Unit	**Topics/Sub-topics**	**Hours**	**Marks**	**CO**	**R Level**	**U Level**	**A Level**
4	**Hydrology**	**06**	**08**	**2**	**20%**	**40%**	**40%**
4.1	Definitions- rainfall, rain gauge and rain gauge station, average annual rain fall.						
4.2	Definition of runoff, factors affecting run off, calculation of run off by runoff coefficient, Inglis' formula.						

4.3	Unit hydrograph and its uses.						
5	**Bandhara Irrigation and Percolation Tanks**	**04**	**07**	**4**	**30%**	**40%**	**30%**
5.1	Layout and component parts, Advantages and disadvantages of bandhara irrigation.						
5.2	Percolation Tanks– necessity and importance, selection of site.						
6	**Diversion Head Works**	**06**	**08**	**4**	**20%**	**50%**	**30%**
6.1	Weirs – components parts, functions and types, layout of diversion head works with its components and their function, canal head regulator, Purpose of silt excluders and silt ejectors.						
6.2	Barrages – components and their function. Difference between weir and barrage.						
7	**Canals**	**08**	**12**	**2,4**	**30%**	**30%**	**40%**
7.1	Classification of canals according to alignment and position in the canal network. Lacey's and Kennedy's Silt theories.						
7.2	Canal lining – Definition, purpose, types of canal lining, and advantages of canal lining.						
7.3	Cross Drainage works- Concept and different types of C.D. works.						
	Total of Section II	**24**	**35**				
	Total of Section I & II	**48**	**70**				

V. SUGGESTED SPECIFICATION TABLE (Theory)

Unit No.	Unit Title	Teaching Hours	R Level	U Level	A Level	Total Marks
1	Introduction	03	60%	40%	-	05
2	Water Requirement of Crops	05	30%	50%	20%	08
3	Dams and Spillways	16	30%	40%	30%	22
4	Hydrology	06	20%	40%	40%	08
5	Bandhara Irrigation and Percolation Tanks	04	30%	40%	30%	07
6	Diversion Head Works	06	20%	50%	30%	08
7	Canals	08	30%	30%	40%	12

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.*

VI. LIST OF PRACTICAL/ASSIGNMENTS/TUTORIALS:

Sr. No.	Tutorial Exercise	Hours	CO
1.	Study of National Water Policy and Maharashtra Water Policy.	04	1,2,3,4,5,6
2.	Collection of information and prepare list of documents and drawings required for irrigation project.	04	1
3.	Study of various watershed management techniques adopted in farms.	04	4
4.	Numerical on Calculation of Canal capacity.	04	6
5.	Six assignments based on the syllabus.	10	1,2,3,4,5,6
6.	**Mini-project-** Student should collect information of any one major dam in the state and present a seminar with report.	06	3
	TOTAL	32	

VII. REFERENCE BOOKS AND WEBSITES:

Sr. No	Author	Title	Publisher
1	Sharma R.K. & Sharma T.K.	Irrigation Engineering (Including Hydrology)	S.Chand & Co.Ltd, 2nd Edition, 2004
2	S.K.Garg	Irrigation and Hydraulic structure	Khanna publisher, New Delhi, 1981
3	Dr.P.N.Modi	Irrigation Water Resources & Water Power Engineering	Standard Book House,7th edition,2008.
4	Basak N.N.	Irrigation Engineering	Tata McGraw-Hill Publishing Co.,1st Edition, October 1999.
5	Dr.B.C.Punmia, Dr.Pande Brijbasi Lal	Irrigation & Water Power Engineering	Laxmi Publications 16th editions 2009.

VIII. SUGGESTED COS-POS MATRIX FORM

(CO's)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO- 1	PSO- 2	PSO- 3	PSO- 4
CO1	1	1	-	-	1	-	1	2	-	2	-
CO2	3	3	2	2	-	2	2	3	-	3	-
CO3	3	3	2	2	-	-	1	3	-	3	-
CO4	2	2	-	3	3	2	1	3	-	3	2
Legends: - High:03, Medium:02, Low:01, No Mapping											

Curriculum Coordinator Head of the Department Dean Diploma

BOS approved 23/05/2025

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE DIP EXAM MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	**: DIPLOMA IN CIVIL ENGINEERING**
PROGRAMME CODE	**: DCE**
SEMESTER	**: FIFTH**
COURSE TITLE	**: WATER SUPPLY AND WASTE WATER DISPOSAL**
COURSE CODE	**:231CE53**

I. LEARNING AND ASSESSMENT SCHEME:

LEARNING SCHEME					ASSESSMENT SCHEME											
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	-	2.5	3	30	70	28	100	40	25	10	25@	10	-	-	150

CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment.

II. COURSE OBJECTIVES:

This subject aims to equip students with knowledge of water sources, treatment, distribution, and wastewater management. It covers water intake, purification, and supply systems, along with wastewater collection, treatment, and disposal. Students will learn to design and analyze water and sewage systems while ensuring public health and environmental sustainability. The course also emphasizes regulatory standards, modern technologies, etc.

III. COURSE OUTCOMES (CO):

The student should be able to

CO1	Interpret the water demand and quality of water and waste water by conducting tests on it
CO2	Analyze the working of water and waste water treatment plant.

CO3	Manage water supply & its distribution.
CO4	Design sewers, septic tanks.
CO5	Compare sewage disposal methods.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE:

Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
SECTION-I								
1		**Water Demand & Supply Scheme:**						
1	1.1	**Water Demand:** Objectives of public water supply, Water Demand types, Population Forecasting, Estimation of water demand, Fluctuations in demand of water	03	06	1	35%	35%	30%
	1.2	**Water Supply Scheme:** Components of water supply scheme, Design Period.						
2		**Quality of Water:**	02	04	1	25%	25%	50%
	2.1	**Potable, Wholesome, Contaminated Water:** Terminology						
	2.2	**Tests on Water:** Physical, Chemical and Bacteriological impurities & analysis.						
	2.3	**Drinking Water Quality Standards:** As per IS specifications.						
3		**Treatment of Water:**	14	17		30%	40%	30%

	3.1	**Water Treatment Plant:** Units, Flow Diagram			2				
	3.2	**Water Treatment Processes:** Screening, Aeration and Sedimentation: factors affecting sedimentation, Horizontal flow type sedimentation tank.							
	3.3	**Coagulation:** Coagulants and Coagulant aids, Jar test, Choice of coagulant.							
	3.4	**Filtration:** Types of filters- Rapid sand filter, Slow sand filter, Pressure filters: Construction & operation, Types of under drainage system, Back washing of rapid sand filter, Comparison between rapid sand & slow sand filter.							
	3.5	**Disinfection:** Various methods, Free and combined residual chlorine, Chlorine demand, Break point chlorination, Super chlorination, Dechlorination.							
	3.6	**Softening:** Objectives of water softening, Temporary & Permanent hardness of water, causes & comparison. Methods of removing temporary hardness- Boiling, Addition of Lime. Methods of removing permanent hardness – Lime-Soda, Zeolite process.							
	3.7	**Advanced water treatment-** Electro- dialysis, Reverse Osmosis							
4		**Transmission and Distribution :**	05	8	3	40%	30%	30%	

	4.1	**Methods of water distribution systems:** Gravity, Pumping & Dual, merits, demerits.						
	4.2	**Systems of Supplying Water:** Continuous & Intermittent, Comparison						
	4.3	**Layout of Water Distribution Pipe:** Dead end, Grid Iron, Circular, Radial, their advantages & disadvantages.						
		Total of Section I	**24**	**35**				
SECTION-II								
5		**Waste Water :**	03	06	1	50%	50%	--
	5.1	**Characteristics of Sewage:** Composition of sewage.						
	5.2	**Sewerage System:** Separate, Combined and Partially separate, Sanitary and Storm water sewers, Comparison of separate and combined system, Quantity fluctuations of sewage.						
	5.3	**Shape & Sewer Materials:** Laying of sewer, Sewer appurtenances- manholes, drop manholes.						
6		**Design of Sewer:**	05	08	4	20%	30%	50%
	6.1	**Design of Sewer:** maximum and minimum velocities to be generated in sewers, Self-cleaning velocity, Non-Scouring Velocity, Comparison between self-cleaning & non						

		scouring velocity, Problems on design of sewers.						
	6.2	**Aerobic and Anaerobic Process:** Comparison						
7		**Sewage Strength:**	02	04	1	50%	50%	--
	7.1	**Sewage Strength:** BOD, COD, Uses of BOD & COD test. Comparison between BOD & COD.						
8		**Sewage Treatment:**	08	08	2	20%	50%	30%
	8.1	**Sewage Treatment:** Objective, flow diagram using TF & ASP. Preliminary sewage treatment- Screens, Grit chamber, Skimming tank.						
	8.2	**Primary Treatment:** Sedimentation.						
	8.3	**Secondary or Biological Treatment:** by Trickling filters construction and working, merits and demerits of trickling filter, Activated Sludge Process (ASP). Oxidation pond, Oxidation ditch.						
	8.4	**Sludge Disposal:** Digestion of sludge, Dewatering of sludge, Sludge Drying Beds.						
9		**Low Cost Sanitation:**	03	04	4	40%	--	60%
	9.1	**Septic Tank:** Treatment and disposal of septic tank effluent.						
	9.2	**Design of Septic Tank:** Design considerations, Problems.						

10		**Disinfection & Disposal of Sewage:**	03	05	5	60%	--	40%
	10.1	**Disinfection of Sewage:** Methods of disinfection of sewage						
	10.2	**Sewage Disposal:** Discharge of raw and treated sewage on land and water, Comparison of sewage disposal method, Sewage Sickness.						
		Total of Section II	**24**	**35**				

V. SUGGESTED SPECIFICATION TABLE (Theory)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Water Demand & Supply Scheme	03	35%	35%	30%	06
II	Quality of Water	02	25%	25%	50%	04
III	Treatment of Water	14	30%	40%	30%	17
IV	Transmission and Distribution	05	40%	30%	30%	08
V	Waste Water	03	50%	50%	--	06
VI	Design of Sewer	05	20%	30%	50%	08
VII	Sewage Strength	02	50%	50%	--	04
VIII	Sewage Treatment	08	20%	50%	30%	08
IX	Low Cost Sanitation	03	40%	--	60%	04
X	Disinfection & Disposal of Sewage	03	-	40%	60%	05
	Total	**48**				**70**

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

VI. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS:

Sr. No.	Unit	Practicals	Approx. Hours	CO
A		**Tests on Water**		
1*	1	To determine pH of the given water sample	2	1
2*	2	To determine Total solids, Dissolved solids & suspended solids of the given water sample	2	1
3*	3	To determine Turbidity of the given water sample	2	1
4*	4	To determine Optimum Alum Dose by Jar test for the given water sample	2	1
5*	5	To determine Residual chlorine of the given water sample	2	1
6*	6	To determine Chloride content of the given water sample	2	1
7*	7	To determine Total hardness of the given water sample	2	1
8*	8	To determine Total Alkalinity of the given water sample	2	1
9*	9	To determine Dissolved Oxygen of the given water sample	2	1
B		**Tests on Waste water**		
1	1	To determine Sludge Volume Index of the given waste water sample.	2	1
2	2	To determine BOD of the given waste water sample	2	1

3	3	To determine COD of the given waste water sample	2	1
4*	4	To determine Dissolved Oxygen of the given waste water sample	2	1
5	5	To determine Total solids, Dissolved solids & Suspended solids of the given waste water sample	2	1
C		**Mini-projects**		
1		1. Water Supply to Mumbai City 2. Recycling of Waste Water And Its Uses. 3. Problems Due To Improper Handling of Waste Water.	4	1,2,3,4,5
* Minimum 8 and maximum 12 practicals/experiment sessions to be included in a Course in a term. Note: * - Mandatory Assignment/Tutorial/Practical				

VII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

TEXT BOOKS:

Sr. No.	Author	Title	Publisher and Edition
1.	S. K. Garg	Water Supply Engineering- Vol-I	Khanna Publishers , New Delhi, 25th Revised, 2014.
2.	S. K. Garg	Environmental Engineering- Vol-II	Khanna Publishers , New Delhi, 33rd Revised, 2015.
3.	Rangawala S. C.	Water supply & sanitary engineering	Charotar publications, Anand 388 001, 29th Edition : 2016

REFERENCE BOOKS AND WEBSITES:

Sr. No.	Author	Title	Publisher and Edition
1.	Dr. P. N. Modi	Water supply Engineering	Standard Book House, New Delhi 5th edition , 2016.
2.	Dr. P. N. Modi	Sewage treatment & disposal and waste water engineering	Standard Book House, New Delhi 4th Edition, 2010.
3.	Gurucharan Singh	Water Supply & Sanitary Engineering	Standard Publisher, 5th 2007
	Manuals		
		CPHEEO Manual on Water Supply and Treatment	Ministry Of Urban Development, May 1999.
		CPHEEO Manual on Sewerage and Sewage Treatment	Ministry Of Urban Development, May 1999.
		IS Codes	Bureau of Indian Standards
4	Websites: a) http://www.intelitek.com/engineering/civil-engineering/introduction-to-water-supply-engineering/ b) nptel.ac.in/courses/105104102/ c) nptel.ac.in/courses/105106119/ d) https://www.accessengineeringlibrary.com/browse/water-and-wastewater-engineering-design-principles-and-practice		

SITE VISITS:

1. Water Treatment Plant. Students shall submit visit report.

2. Waste Water Treatment Plant. Students shall submit visit report.

VIII. SUGGESTED COS-POS MATRIX FORM

(CO's)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO- 1	PSO- 2	PSO- 3	PSO- 4
CO1	3	2	3	2	1	1	1	3	2	3	2
CO2	3	2	3	2	1	0	1	3	2	3	2
CO3	1	2	3	2	0	1	1	1	2	3	2
CO4	3	2	0	3	1	0	1	3	2	0	3
CO5	2	2	3	2	2	2	1	2	2	3	2

Legends: - High:03, Medium:02, Low:01, No Mapping

Curriculum Coordinator Head of the Department Dean Diploma

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE DIP EXAM MATUNGA MUMBAI-19

BOS approved 23/05/2025

DIPLOMA PROGRAMME	: DIPLOMA IN CIVIL ENGINEERING
PROGRAMME CODE	: DCE
SEMESTER	: FIFTH
COURSE TITLE	: ADVANCED CONSTRUCTION TECHNIQUES
COURSE CODE	: 231CE54

I. LEARNING AND ASSESSMENT SCHEME:

TEACHING SCHEME					EXAMINATION SCHEME											
										Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
										FA-PR (CA)		SA-PR (PR/OR)		SLA		
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL							
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	2	-	-	2.5	3	30	70	28	100	40	25	10	-	-	-	-	125

II. COURSE OBJECTIVES:

The infrastructure development is at its peak and many advance techniques are used for various construction activities. The students will gain the knowledge about the features and utility of various equipment's and techniques used in all construction activities.

III. COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

CO1	State various techniques and equipment required for construction activities.
CO2	Recognize methods of excavation and dewatering in different types of soils
CO3	Explore concreting methods and equipment's used for different concreting conditions.
CO4	Estimate the owning and operating cost of the equipment's used on construction site.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I							
Unit & Sub-Unit	**Topics/Sub-topics**	**Hours**	**Marks**	**COS**	**R Level**	**U Level**	**A Level**
1	**Excavation in Rock and Earth**	**08**	**10**	**1,2**	**30%**	**60%**	**10%**
1.1	Definitions: Bits, Cuttings, Drifters, Drills (Abrasion, Churn, Core, Diamond, Percussion and shot), Blast hole, explosives, safety fuse and blasting cap.						
1.2	Brief description of different types of drills (Jack hammer, drifters, churn drill, shot drill & diamond drill)						
1.3	Types of Explosives (Dynamite, Slurry, ANFO and Primers), Handling and storage explosives						
1.4	Introduction of Equipment used for excavation:(Power Shovel, Back Hoe Loader, TBM)						
2	**Dewatering of foundation**	**06**	**7**	**1,3**	**50%**	**30%**	**20%**
2.1	Necessity and Techniques used. - Drains, sumps, pumps, well point system (Single and Multiple).						
3	**Scaffolding and shoring**	**04**	**8**	**1**	**20%**	**20%**	**60%**
3.1	Definition and utility, types of scaffolding according to use for masonry and finishing works.						
3.2	Types of shoring - Raking, Dead and flying						
4	**Advancements in Concreting**	**06**	**10**	**3**	**40%**	**30%**	**30%**

4.1	Concreting in different weather conditions (Hot and cold weather), Methods of Underwater concreting.						
4.2	Equipment's used for concreting: Batcher, Mixer, Batching plant, Concrete Pump.						
	Total of Section I	**24**	**35**				

SECTION – II

Unit & Sub-Unit	Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
5	**Formwork**	**06**	**10**	**1**	**20%**	**30%**	**50%**
5.1	Formwork for structural members (Columns, Beam and slab)						
5.2	Advanced methods of Shuttering						
6	**Heavy Equipment**	**10**	**15**	**1**	**20%**	**40%**	**40%**
6.1	Cranes: Classification and utility of cranes, Features of major types of mobile and tower cranes, selection criteria for types of cranes.						
6.2	List of construction equipment-Construction Lifts, road roller, sheep's foot roller.						
7	**Equipment Cost**	**8**	**10**	**4**	**20%**	**40%**	**40%**
7.1	Definitions: Salvage value and depreciation.						
7.2	Cost of owning and operating cost, numerical for calculation of						

	depreciation by straight line method and sinking fund method.						
	Total of Section II	**24**	**35**				
	Total of Section I & II	**48**	**70**				

V. SUGGESTED SPECIFICATION TABLE (Theory)

Unit No.	Unit Title	Teaching Hours	R Level	U Level	A Level	Total Marks
1	Excavation in Rock and Earth	08	30%	60%	10%	10
2	Dewatering of foundation	06	50%	30%	20%	7
3	Scaffolding and shoring	04	20%	20%	60%	8
4	Advancements in Concreting	06	40%	30%	30%	10
5	Formwork	06	20%	30%	50%	10
6	Heavy Equipment	10	20%	40%	40%	15
7	Equipment Cost	8	20%	40%	40%	10

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.

VI. LIST OF PRACTICAL/ASSIGNMENTS/TUTORIALS:

Sr. No	Practical/Assignment	Approx. Hrs	CO
1.	Submit one site visit report on major equipment's used on site from two site visits.	4	1, 2, 3, 4
2.	20 sketches of types of scaffolding, shoring, formwork for various structural members, concrete pump, builders hoist, vibrator and various steel member connections.	10	1, 2, 3

3.	Numerical on calculation of depreciation by straight line method and sinking fund	4	4
4.	5 assignments based on syllabus	8	1, 2, 3, 4
5.	Power point presentation on advanced equipment's used for construction activities.	6	1, 2, 3, 4
	TOTAL	**32**	

Term work shall consist record of tutorials.

VII. REFERENCE BOOKS AND WEBSITES:

Sr. No	Author	Title	Publisher
1	Arora S.P. and Bindra S.P.	Building Construction, Planning Techniques and method of construction	Dhanpat Rai and Sons, edition 1997
2	Peurifoy, R.L, Ledbetter W.B. and Schexnayder	Construction Planning, Equipment's and Methods	McGraw Hill, Singapore, 5th edition
3	Dr Mahesh Verma	Construction Equipment and its planning and application	Metropolitan Book Company New Delhi.
4	Sharma S.C.	Construction Equipment and Management	Khanna Publisher New Delhi.

VIII. SUGGESTED CO-PO MATRIX FORM

	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
(CO's)	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO- 1	PSO- 2	PSO- 3	PSO- 4
CO1	3	1	1	-	3	-	2	1	-	3	1
CO2	2	1	3	2	1	-	2	2	-	2	1
CO3	2	2	2	2	1	-	2	2	-	2	1
CO4	1	1	3	2	2	-	2	2	-	1	1
Legends: - High:03, Medium:02, Low:01, No Mapping											

Curriculum Coordinator Head of the Department Dean Diploma

BOS approved 23/05/2025
V DCE R23, VJTI

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE DIP EXAM MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	**: DIPLOMA IN CIVIL ENGINEERING**
PROGRAMME CODE	**: DCE**
SEMESTER	**: FIFTH**
COURSE TITLE	**: REINFORCED CEMENT CONCRETE**
COURSE CODE	**: 231SE55**

I. LEARNING AND ASSESSMENT SCHEME

ASSESSSMENT SCHEME															
CL	TL	LL	CR	PAPER (Hrs)	FA-TH (MST)	SA-TH (ESE)		TOTAL		FA-PR (CA)		SA-PR (PR/OR)		SLA		TOTAL MARKS
					Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	2	0	2.5	3	30	70	28	100	40	25	10	-	-	-	-	125

CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

II. COURSE OBJECTIVES

This syllabus deals with the analysis and design of basic structural components which form parts of most of the structures to give the feel of design of basic to complex structures.

III. COURSE OUTCOMES (CO)

Students should be able to

CO1	Understand about the materials in RCC and their permissible stresses as per IS code specifications
CO2	Analyse load and moment carrying capacity of various components of a building as per limit state method
CO3	Design various components of a simple building as per limit state method
CO4	Draw the reinforcement detailing sketches of various components of the building as per limit state method

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION - I							
Unit & Sub-Unit	**Topics/Sub-topics**	**HRS**	**Marks**	**CO**	**R Level**	**U Level**	**A Level**

1	**Materials**	**04**	**05**	**1**	**21**	**37**	**42**
1.1	Grade of concrete and corresponding various permissible stresses as per IS 456-2000						
1.2	Reinforcing materials: Grades of reinforcement steel and corresponding various permissible stresses as per IS :456-2000						
2	**Introduction to working stress method of design**	**04**	**05**	**2, 3, 4**	**24**	**34**	**41**
2.1	Reinforced Concrete Fundamentals (working Stress Method): Concept of reinforced concrete, stress strain characteristics of concrete and steel reinforcement, elastic theory.						
2.2	Singly reinforced, balanced section, under reinforced section and over reinforced section.						
3	**Limit state method of design**	**08**	**15**	**2, 3, 4**	**14**	**32**	**54**
3.1	Concepts of probability and reliability, characteristic loads, characteristic strength, partial safety factors for material strength						
3.2	Introduction to limit states of collapse in flexure, direct compression, shear and limit states of serviceability in deflection and cracking, types of loads and combinations as per IS 875 (part I to IV)						
3.3	Moment of resistance of singly reinforced sections, Design of singly reinforced rectangular section Reinforcement detailing sketches						
4	**Shear and bond (LSM):**	**08**	**10**	**2, 3, 4**	**14**	**32**	**54**
4.1	Shear stresses in R.C beam section, diagonal tension, shear reinforcement, vertical stirrups, bent up bars, inclined and diagonal reinforcement						
4.2	Bond stresses, development length, curtailment of reinforcement, lap length						
4.3	Design of members in shear and bond with reinforcement detailing sketches						
Total of section I		**24**	**35**				

SECTION - II							
Unit & Sub-Unit	**Topics/Sub-topics**	**HRS**	**Marks**	**CO**	**R Level**	**U Level**	**A Level**
5	**Design of one-way slabs (LSM)**	**08**	**10**	**2,3, 4**	**14**	**32**	**54**
5.1	Types of slabs as per support conditions and main reinforcement direction and position: one way slab, two-way slab (theory)						
5.2	Design of one-way slabs: Simply supported, cantilever and one-way continuous slab with reinforcement detailing sketches						
6	**Design of axially loaded short columns (LSM)**	**08**	**10**	**2,3, 4**	**24**	**35**	**41**
6.1	Rectangular and square columns axial loads with minimum eccentricity, load carrying capacity and design of axially loaded short square and rectangular columns with reinforcement detailing sketches						
7	**Design of foundation (LSM)**	**08**	**15**	**2,3, 4**	**30**	**35**	**35**
7.1	Isolated square and rectangular footings subjected to axial load and moments with reinforcement detailing sketches						
Total of section II		**24**	**35**				

V. SUGGESTED SPECIFICATION TABLE (Theory)

Unit No.	Unit Title	Teaching hours	R Level	U Level	A Level	Total Marks
I	Materials	04	21%	37%	42%	05
II	Introduction to working stress method of design	04	24%	34%	41%	05
III	Limit state method of design	08	14%	32%	54%	15
IV	Shear and bond (LSM)	08	14%	32%	54%	10

V	Design of one-way slab (LSM)	08	14%	32%	54%	10
VI	Design of axially loaded columns (LSM)	08	16%	37%	47%	10
VII	Design of foundation (LSM)	08	30%	35%	35%	15

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

VI. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

Sr. No.	Practical/Assignment/Tutorial Title	No. of Hours	CO
1	DESIGN REPORT I AND DRAWING SHEET 1		
1.1	Design and reinforcement detailing sketch of singly reinforced beam	4 hrs	2,3,4
1.2	Design and reinforcement detailing sketch of singly reinforced beam-cantilever	4 hrs	2,3,4
1.3	Design and reinforcement detailing sketch of one way-simply supported slab	4 hrs	2,3,4
1.4	Design and reinforcement detailing sketch of one way-cantilever slab	4 hrs	2,3,4
1.5	Design and reinforcement detailing sketch of one way-continuous slab	4 hrs	2,3,4
2	DESIGN REPORT 2 AND DRAWING SHEET 2		
2.1	Design and reinforcement detailing sketches of axially loaded column	4 hrs	2,3,4
2.2	Design and reinforcement detailing sketches of isolated square footing	4 hrs	2.3.4
2.3	Design and reinforcement detailing sketches of isolated rectangular footing	4 hrs	2.3.4

VII. SUGGESTED SELF LEARNING ASSIGNMENTS/MICRO PROJECTS/ACTIVITIES

- Procure actual working drawing/ blue print of structural design of RCC structures and write report after checking actual reinforcement placed at site
- Collect the details of various types of formworks used for RCC at site
- Visit the site and check the level for slab, plumb of column and depth of column as per blue print and write detailed procedure of any one.

VIII. SUGGESTED LEARNING MATERIALS: TEXTBOOKS

Sr. No	Author	Title	Publisher
1	Committee members of BIS	IS 456:2000, Plain and reinforced concrete- Code of practice	BIS, New Delhi
2	Committee members of BIS	SP 34 (1987) Handbook on concrete reinforcement and detailing	BIS, New Delhi
3	S Ramamrutham and R Narayanan	Design of reinforced concrete structures	Edition-2006, publisher Dhanpat Rai Publication Company. ISBN:-13-978-9352161324
4	B.C Punmia. Ashok K Jain, Arun K Jain	R.C.C Designs (Reinforced concrete structures)	Tenth edition, 2006, Lakshmi publications ISBN 13: 978-8131800942

IX. SUGGESTED LEARNING MATERIALS: REFRENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher
1	H.J. Shah	Design of reinforced concrete structures	12th Edition 2021, Charotar publication ISBN: 13-978- 9385039478,
2	V. L. Shah and Karve	Limit state Theory and design of reinforced concrete structures	Structures Publications. (ISBN- 13-978-8190371711/8190371711).
3	P.C Varghese	Limit State Design of Reinforced Concrete	PHI Learning Private limited, Delhi ISBN 13:978-8120320390

4	S Unnikrishnan Pillai, Devdas Menon	Reinforced Concrete Design	Tata McGraw Hill publications, New Delhi ISBN 13:978-0070141100
5	N Krishna Raju, R.N Pranesh	Reinforced concrete design principles and practice	New Age international, Mumbai ISBN 13:978-8122414608
6	Vazirani and Ratwani	Design of reinforced concrete structures	Edition-2006, Publisher-Dhanpat Rai and Co.
7	Website	https://archive.nptel.ac.in/course s/105/105/105105105/	NPTEL, Design of Reinforced Concrete structures, video letures, Prof. Nirjhar Dhang, IIT Kharagpur

X. SUGGESTED CO-PO MATRIX FORM

Course Outcomes (CO)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO-1	PSO- 2	PSO-3	PSO-4
CO1	2	-	1	-	2	-	2	-	-	-	-
CO2	3	3	3	-	3	-	3	3	3	-	2
CO3	3	3	3	-	3	-	3	3	3	-	2
CO4	3	3	3	-	3	-	3	3	3	-	2

Curriculum Coordinator

Head of the Department

Dean Diploma

VERMATA JIJABAI TECHNOLOGICAL INSTITUTE
DIP EXAM
MATUNGA
MUMBAI-19

BOS approved 23/05/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN CIVIL ENGINEERING**
PROGRAMME CODE	**: DCE**
SEMESTER	**: FIFTH**
COURSE TITLE	**: DISASTER MANAGEMENT**
COURSE CODE	**: 231CE56E1**

I. LEARNING AND ASSESSMENT SCHEME:

LEARING SCHEME				ASSESSMENT SCHEME												
CL	TL	LL	CR	PAPER (Hrs)	FA-TH (MST)	SA-TH (ESE)		TOTAL		FA-PR (CA)		SA-PR PR/OR		SLA		TOTAL MARKS
					Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	2	-	2.5	3	30	70	28	100	40	25	10			-	-	125

#Assessment by Internal & External Examiner.

II. COURSE OBJECTIVES:

The course is intended to provide a general concept in the dimensions of disasters caused by nature beyond the human control as well as the disasters and environmental hazards induced by human activities with emphasis on disaster preparedness, response and recovery.

III. COURSE OUTCOMES (CO):

Students should be able to

CO1	Identify the characteristics of various natural and man-made disasters and its impacts
CO2	Understand the concept of disaster management cycle and capacity building.
CO3	Understand different tools to minimize the risk of disasters and disaster management effort taken up by our country.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION-I									
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level	
1		**Introduction to Disaster Management**	**04**	**10**	**2**	**50%**	**50%**	**-**	
1	**1.1**	**Technical terms**: Hazard, Vulnerability, risk, accident, disaster,							

		disaster management.						
	1.2	**Significance and Role:** Significance of disaster management and the role of engineers in disaster management.						
2		**Types of Disasters**	**16**	**18**	**1**	**40%**	**40%**	**20%**
	2.1	**Water & Climate:** floods, Regions in the Country Prone to Floods, types of flood, cyclones, tornadoes and hurricanes, hailstorms, cloudbursts, heat waves and cloud waves, snow avalanches, droughts, sea erosion, thunder lightning (definition, general phenomenon, and damage associated)						
	2.2	**Geological:** Landslides and mudflows, earthquakes, large fires, dam failures and dam bursts.						
	2.3	**Biological:** Epidemics, pest attacks, cattle epidemics, food poisoning.						
	2.4	**Chemical, Industrial & Nuclear:** Chemical, industrial, and nuclear.						
	2.5	**Accidental:** Forest fires, urban fires, mine flooding, oil spills, major building collapses, serial bomb blasts, festival-related disasters, electrical disasters and fires, air, road & rail accidents, ship capsizing, village fire.						
	2.6	**Overview of Natural Disasters in India:** Types of Rivers in India, hazards associated with the river, the Bhopal Gas Tragedy, the Gujarat Earthquake of 2001, the COVID-19 Pandemic						
3		**Disaster Impacts**						

	3.1	**Disaster Impacts:** Environmental, physical, social, ecological, economic, and political. Health, psycho-social issues, demographic aspects (gender, age, special needs), hazard locations. Effect of chemical exposure due to chemical hazard	**04**	**07**	**2**	**40%**	**40%**	**20%**
		Total of Section I	**24**	**35**				
SECTION-II								
Unit & Sub-Unit		**Topics/Sub-topics**						
4		**Disaster Management Mechanism**	**20**	**18**	**2**	**40%**	**40%**	**20%**
	4.1	**Disaster Management Cycle:** Prevention, mitigation, preparedness, relief& recovery Pre-Disaster – Risk Assessment and Analysis, Risk Mapping, zonation and Micro zonation, Prevention and Mitigation of Disasters, Early Warning System; Preparedness, Capacity Development. During Disaster – Evacuation, Disaster Communication, Search and Rescue Emergency Operation Cen, Post-disaster – Damage and Needs Assessment, Restoration of Critical Infrastructure Early Recovery – Reconstruction and Redevelopment.						
	4.2	**Capacity Building:** Structural Measures and Non Structural, Disaster Resistant House Construction, Measures for Flood Management, Cyclone as Coastal belt plantation, Engineered Structure, Early warning systems, Emergency Response, Role of GIS and Information Technology in Disaster Mangement						
5		**Disaster Management in India**	**15**	**17**	**3**	**40%**	**40%**	**20%**

	5.1	**Policies and Legislation for Disaster Risk Reduction (DRR):** Landslide hazard zonation, Cyclone mitigation measures. Policies & legislation for DRR in India, Constitution and Role of National Disaster Management Authority(NDMA), State Disaster Management Authority (SDMA), and other agencies. Role of the Federal Emergency Management Agency FEMA. Agencies in India related to Flood management, Drought Management and other hazards.						
	5.2	Sanitation and Hygiene, Education and Awareness, Dealing with Victims' Psychology, Role and responsibility of Community, Role of Educational Institute, Do's and Don'ts during different types of Disaster, Objectives of Industrial Safety						
		Total of Section II	**24**	**35**				

IV. 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 Disaster Management	04	50%	50%	--	10
II	Types of Disasters	16	40%	40%	20%	18
III	Disaster Impacts	04	40%	40%	20%	07
IV	Disaster Management Mechanism	20	40%	40%	20%	17
V	Disaster Management in India	15	50%	30%	20%	18
TOTAL		48				70

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.*

V. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS:

Sr. No.	Unit	Assignments	Approx. Hours	CO
1.	1	Introduction to Disaster Management: Technical Terms, significance & Role	2	2
2.	2	Different types of Disasters occurred in India (last 50 years) Name, year, Causes, impact, mitigation measure as per the types of disaster. Discuss case study of any two major disaster faced by India.	4	1
3.	3	Disaster Impacts: Major impactful disaster occurs in the world and their impact.(any two)	4	1
4	4	Disaster Management Mechanism: Fire hazard, CPR technique and others, Role of agencies, Structural and Non structural measure of the disaster.	2	2
5	5	Disaster Management in India	4	3
6	6	**Mini Projects**- students will work in group on following: 1. Regional Case study- Survey of recent regional (local, Sta adjoining state) disaster. 2. Prepare a report of above and submit it. 3. Students will visit any Government Organization/ Office study Disaster Management. 4. Prepare a report of above & submit it. 5. Presentation of above mini projects.	16	1,2,3

* Minimum 4 and maximum 6 practicals/experiment/Tutorials sessions to be included in a course term work in a term.

VI. LEARNING MATERIALS/TEXT BOOKS/ REFERENCE BOOKS AND WEBSITES TEXT BOOKS:

Sr. No.	Author	Title	Publisher and Edition
1.	N. Murthy D.B.	Disaster Management-Text and Case Studies.	Publisher: Deep &Deep Publications.Edition: 007
2.	Ghosh G.K.	Disaster Management	APH Publishing Corporation.

			Edition : 2006
3.	Singh B.K.	Handbook of Disaster Management, Techniques & Guidelines	Rajat Publication.Edition : 2008

REFERENCE BOOKS AND WEBSITES:

Sr. No.	Author	Title	Publisher and Edition
1.	Sahni, Pardeep Ariyabandu, Madhavi Malalgoda	Disaster Risk Reduction South Asia	Prentice Hall Edition: 2004
2.	Manual on Natural Disaster Management in India		
3.	Disaster Management Act – 2005		
4.	Websites: a) www.undp.org b) NPTEL course on Natural Hazard NOC IIT Kanpur https://nptel.ac.in/courses/105104183 c) NPTEL course on Disaster Recovery and Build Back Better. IIT Roorkee https://nptel.ac.in/courses/124107010		

VII. SUGGESTED CO-PO MATRIX FORM

CO's	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO- 1	PSO- 2	PSO- 3	PSO- 4
CO1	2				3	3	3				2
CO2	2		2	2	3	2	3	1		1	2
CO3	2		2	2	3	2	3	1		1	3

Legends: - High:03, Medium:02, Low:01, No Mapping

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

BOS approved dated 23/05/2025

VERMATA JIJABAI TECHNOLOGICAL INSTITUTE DIP EXAM MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	**: DIPLOMA IN CIVIL ENGINEERING**
PROGRAMME CODE	**: DCE**
SEMESTER	**: FIFTH**
COURSE TITLE	**: PAVEMENT ANALYSIS AND DESGIN**
COURSE CODE	**: 231CE56E2**

III. LEARNING AND ASSESSMENT SCHEME:

LEARNING SCHEME					ASSESSMENT SCHEME												
CL	TL	LL	IKS	CR	PAPER (Hrs)	FA-TH (MST)	SA-TH (ESE)		TOTAL		FA-PR (CA)		SA-PR PR/OR		SLA		TOTAL MARKS
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	2	-	1	2.5	3	30	70	28	100	40	25	10	-	-	-	-	125

CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment, # External Assessment.

IV. COURSE OBJECTIVES:

The purpose of this course is to introduce the concepts of design and analysis of flexible and rigid pavements. The students will gain experience with classic pavement analysis techniques.

III. COURSE OUTCOMES (CO):

Student should be able to

CO1	Identify the pavement components and compare highway and airport pavements
CO2	Compute the stresses and ESWL in flexible pavements
CO3	Design the flexible pavements using empirical, semi-empirical and IRC method
CO4	Calculate the warping, friction and wheel load stresses
CO5	Design the rigid pavements by IRC method

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION-I								
Unit	**Sub unit**	**Topics/Sub-topics**	**HRS**	**Marks**	**CO**	**R Level**	**U Level**	**A Level**
1		Pavements	06	08	1	60%	30%	10%
	1.1	Types and components of pavement						
	1.2	Factors affecting design and performance of pavements						
	1.3	Comparison between highway and airport pavements						
	1.4	Materials used in pavements, functions and significance of subgrade properties						
2		Stress in flexible pavements	08	12	2	30%	50%	20%
	2.1	Layered system concept						
	2.2	Stresses and deflections in homogeneous masses						
	2.3	Burmister's 2-layer,3-layer theories						
	2.4	Wheel load stresses- ESWL of multiple wheels, repeated loads and EWL factor						
3		Flexible pavement design	10	15	3	10%	40%	50%
	3.1	Empirical , semi-empirical and theoretical approaches; Principles and procedure, Design, Advantages and						

		applications of different pavement design methods						
	3.2	IRC method of design						
	3.3	Distresses in flexible pavements						
		Total of Section I	**24**	**35**				
		SECTION-II						
4		Stress in rigid pavements	12	15	4	30%	50%	20%
	4.1	Types of stresses and causes						
	4.2	Factors influencing the stresses						
	4.3	General conditions in rigid pavement analysis						
	4.4	ESWL, Wheel load stresses						
	4.5	Warping stresses						
	4.6	Friction stress						
	4.7	Combined stresses						
5		Rigid pavement design	12	20	5	10%	40%	50%
	5.1	Importance of joints in rigid pavements, Types of joints in cement concrete rigid pavements and their function						
	5.2	Joint spacing						
	5.3	Design of slab thickness						
	5.4	Design of joints						
	5.5	Details of longitudinal joints						

	5.6	Details of contraction joints						
	5.7	Details of expansion joints						
	5.8	IRC method of design						
	5.9	Distress in rigid pavements						
		Total of Section II	**24**	**35**				

V. SUGGESTED SPECIFICATION TABLE (Theory)

Unit No.	Unit Title	Teaching Hours	R Level	U Level	A Level	Total Marks
1	Pavements	06	60%	30%	10%	08
2	Stress in flexible pavements	08	30%	50%	20%	12
3	Flexible pavement design	10	10%	40%	50%	15
4	Stress in rigid pavements	12	30%	50%	20%	15
5	Rigid pavement design	12	10%	40%	50%	20

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.*

VI. LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS/SELF LEARNING:

Sr. No.	Unit	Tutorials	Approx. Hours	CO
1	1	Factors affecting of design and performance of pavements	2	1
2*	2	Numericals based on two layer and three-layer Burmister theory	2	2

3	2	Equivalent Single wheel Load (ESWL) and Equivalent Axle Load Factor	2	2
4*	3	Numericals based on CBR & IRC method of flexible pavement design	4	3
5*	3	Design of flexible pavement	2	3
6*	3	Distress in flexible pavement	2	3
7	4	Numericals based on Westguard analysis of stresses theory	4	4
8	4	Numericals based on warping stresses	2	4
9*	5	Design of Dowel bars and Joints	2	5
10*	5	Design of rigid pavement	2	5
11*	5	Distress in rigid pavement	2	5
12	3,5	Review of flexible and Rigid pavement design	2	3,5
13*	3,5	Mini Project Students will work in a group on the following topics: 1. Collection of distress data for flexible pavement 2. Collection of distress data for rigid pavement	4	3,5

* Mandatory Tutorials

Term work shall consist record of tutorials.

VII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher and Edition
1	Justo, Khanna and A. Veeraragavan	Highway Engineering	Nem Chand & Bros, Roorkee, India & 10th Edition

2	L.R.Kadiyali and N.B.Lal	Principles and Practices of Highway Engineering	Khanna Publishers ,Delhi-6 & 6th Edition
3	R .Srinivasa Kumar	Pavement Design	Universities Press Publication & 1st Edition

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher and Edition
1	Yorder and Witezak	Principles of Pavement Design	John Wiley & Sons, New Jersey,USA,1975
2	Yaung H.Huang	Pavement Analysis and Design	Pearson Printice Hall,2004
3	Papagiannakis, A.T and E.A.Masad	Pavement Design and Materials	John Wiley & Sons, New Jersey, USA, 2008
4	IRC:37- 2012	Guidelines for the Design of Flexible Pavements	
5	IRC:58- 2011	Guidelines for Design of Plain Jointed Rigid Pavements for Highways	

VIII. SUGGESTED CO-PO MATRIX FORM

	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
(CO's)	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO- 1	PSO- 2	PSO- 3	PSO- 4
CO1	1						1	2			
CO2	2	1		1			1	2			2
CO3	2	2	3		1	1	2	2	1		2
CO4	2	1		1			1	2			2
CO5	2	2	3		1	1	2	2	1		2
Legends: - High:03, Medium:02, Low:01, No Mapping											

Curriculum Coordinator Head of the Department Dean Diploma

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE DIP EXAM MATUNGA MUMBAI-19

DIPLOMA PROGRAMME	**: DIPLOMA IN CIVIL ENGINEERING**
PROGRAMME CODE	**: DCE**
SEMESTER	**: FIFTH**
COURSE TITLE	**: CIVIL ENGINEERING SOFTWARE**
COURSE CODE	**: 231CE57**

I. LEARNING AND ASSESSMENT SCHEME:

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
1	-	2	2	2.5	-	-	-	-	-	-	25	10	25@	10	25	10	75

@ Internal Assessment

II. COURSE OBJECTIVES:

The objective is to equip students with the necessary skills and knowledge to effectively use computer software in various aspects of civil engineering design, analysis, and project management. The course will focus on developing proficiency in the use of industry-standard software tools and applications, enhancing students' ability to solve complex engineering problems, and preparing them for professional practice in the field of civil engineering.

III. COURSE OUTCOMES (CO):

The student should be able to

CO1	Understand the fundamental principles and concepts of civil engineering software
CO2	Analyse and interpret engineering data
CO3	Proficiency in applications of software tools for drafting, modelling, and design in civil engineering projects.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE:

Unit & Sub-Unit	Topics/Sub-topics	Hours	CO	R Level	U Level	A Level
1	Introduction 1.1 Importance and need of software for modeling, analysis and design in Civil Engineering field, Advantages and limitations of software, causes for errors, validation of software results. Failures due to errors in modeling, data entry and interpretation of software results.	2	CO1	30%	30%	40%
2	Software application in various disciplines of Civil Engineering: 2.1 Design and detailing using AutoCAD (2D and 3D) 2.2 Building Information Modelling using Autodesk Revit software 2.3 Study of Project Management using Project Libre	10	CO2	20%	20%	60%

V. LIST OF PRACTICALS/ASSIGNBMENTS/TUTORIALS

Sr. No.	Practical/Assignment/Tutorial Title	No. of Hours	Relevant COS
1.	Prepare a floor plan AutoCAD software	2	2
2.	To implement the concept of MEP tools and prepare a 3D model of a plan	2	3
3.	Prepare a 3D model of basic room layout with doors, windows and walls and create schedules for material and equipment.	2	3
4.	Create a new project plan for a simple project including defining tasks, durations and dependencies.	2	2

5.	Generate reports on project progress, resource utilization and budget of the task carried out in point no. 4	2	3
* Minimum 5 and maximum 8 practical/experiment sessions to be included in a course term			

VI. SUGGESTED COS-POS MATRIX FORM

Course Outcomes(Cos)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)			
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO-1	PSO-2	PSO-3	PSO-4
CO1	3	-	-	3	-	1	3	3	-	1	2
CO2	3	2	2	3	-	3	2	1	3	2	2
CO3	3	3	1	3	-	2	3	-	3	2	2
Legends :- High:03, Medium:02,Low:01, No Mapping: -											

VII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFRENCE BOOKS/WEBSITES

TEXTBOOKS:

Sr. No.	Author	Title
1.	Cyndy Davenport and James Wedding	Mastering AutoCAD Civil 3D
2.	R.A. Durai Prabhakaran	Structural Analysis with ETABS
3.	T.S. Sarma	STAAD.Pro V8i for Beginners

WEBSITES:

1. **AutoCAD, Civil 3D, Revit** – https://www.autodesk.com
2. **STAAD.Pro, PLAXIS** – https://www.bentley.com

Curriculum Coordinator Head of the Department Dean Diploma

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE DIP EXAM MATUNGA MUMBAI-19

BOS approved on 23/05/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: FIFTH**
COURSE TITLE	**: PROJECT-I**
COURSE CODE	**: 236CE58**

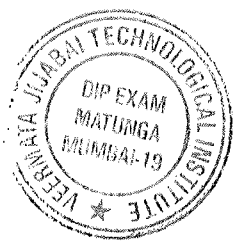
I. LEARNING AND ASSESSMENT SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
-	-	6	-	3	-	-	-	-	-	-	50	20	50#	20	-	-	100

II. COURSE OBJECTIVES

The project provides an opportunity to read research papers and orient themselves for presentations, research paper writing and interact verbally and present their work in front of a gathering with expert help. Seminar presentation boosts the confidence of the students and prepares them precisely for facing the interview panels and group discussions. Through this subject on Project, students will develop new ideas and perspectives of the subject /themes of emerging technologies and services of their area of studies. Projects may even lead to innovations and startups due to their deep study in their chosen subject during the term.

III. COURSE OUTCOMES (COs)



- CO1 - Collect relevant and updated research-based data and information to prepare a statement of purpose for the project.
- CO2 - Establish the action plan for the successful completion of the project under the guidance of an expert guide in the department.
- CO3 - Use various presentation tools and skills for presenting the project work in front of an expert panel.

IV. GENERAL GUIDELINES FOR PROJECT PREPARATION, PRESENTATION AND SUBMISSION OF THE FINAL PROJECT REPORT

a) Batches of students/sometimes individuals shall be formed for projects as decided by the Project Supervisor. The Project Supervisor shall be a faculty of the respective department.

b) Students shall Identify the problem statement and finalise the topic for the project in consultation with their faculty supervisors.

c) Students shall study and assess the feasibility of different solutions and the financial implications.

d) Students should collect relevant data from different sources books / internet / market / suppliers / experts through surveys / interviews). Students shall prepare required drawings/ designs and detailed plans for the successful execution of the work.

e) Students shall present their work on the project at the end of the term in front of the expert panel as framed by the department. They shall submit their ppts to their Project Supervisors for records.

f) Students shall submit two copies of their final Project Reports bound in Maroon colour hardbound book format to their Project Supervisor. One copy shall be retained by the Supervisor and the other copy shall be kept with the Department Head. Students may prepare multiple copies for their own records as required.

1.Organisation of the Project report

The report shall be presented in a number of chapters, starting with Introduction and ending with Summary and Conclusions. Each of the other chapters will have a precise title reflecting the contents of the chapter.A chapter can be subdivided into sections, subsections and sub-subsections so as to present the content discretely and with due emphasis.
When the work comprises two or more mutually independent investigations, the report may be divided into two or more parts, each with an appropriate title. However, the numbering of chapters will be continuous right through, for example Part 1 may comprise Chapters 2-5, Part Two, Chapters 6-9.

The report shall be presented in following sequence:

1. Title sheet
2. Dedication sheet (if desired)
3. Declaration of the Candidate
4. Approval Sheet
5. Abstract
6. Table of contents
7. List of tables (if desired)
8. List of Figures (if desired)
9. Abbreviations / Notations / Nomenclature (if desired)
10. Chapter One : Introduction
11. Chapter Two: Literature Review
12. Chapter/s : Report of Materials and Methods used in the Project work
13. Chapter : Results & Discussions
14. Chapter : Summary & Conclusions
15. Appendix / Appendices (if any)
16. References
17. Acknowledgements

Spiral Binding

Front Cover

The front cover shall contain the following details:

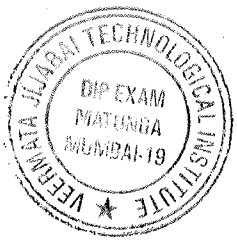
- Full title of report in 6 mm 22 point's size font properly centered and positioned at the top.
- Full name of the candidate/s in 4.5 mm 15 point's size font properly centered at the middle of the page.
- A 40 mm dia. replica of the Institute emblem followed by the name of department, name of the Institute and the year of submission, each in a separate line and properly centered and located at the bottom of page.
- All lettering shall be embossed in gold.

Side of the Hardbound Cover

- The Diploma awarded e.g. DTE, the name of the candidate and the year of submission shall also be embossed on the bound (side) in gold.
- Blank Sheets In addition to the white sheets (binding requirement) two white sheets shall be put at the beginning and the end of the thesis.

1. Title Sheet

This shall be the first printed page of the report and shall contain the submission statement:



The Project Report submitted in partial fulfillment of the requirements of the Diploma in (name of the Diploma awarded), by (the name of candidate) and Roll No. (of the candidate), name(s) of the Project Supervisor / Co- supervisor (s) / Co-Guide(s) (if any), Department, Institute and year of submission.

Sample copy of the 'Title Sheet' is appended (Specimen 'A')

2. Dedication Sheet

If the candidate so desires(s) he may dedicate his/her thesis, which statement shall follow the title page. If included, this shall form the page 1 of the auxiliary sheets but shall not have a page number.

3. Declaration of the Candidate

A declaration of Academic honesty and integrity is required to be included along with every report before the approval sheet.

The format of this declaration is given in Specimen `B' attached.

4. Approval Sheet

In the absence of a dedication sheet this will form the first page and in that case shall not have a page number. Otherwise, this will bear the number two in Roman lower case "ii" at the center of the footer.

Sample copy of the 'Approval Sheet' is appended (Specimen `C')

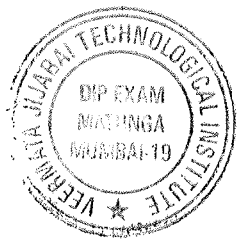
5. Abstract

The 500 word abstract shall highlight the important features of the report and shall correspond to the electronic version to be submitted to the library for inclusion in the website. The Abstract in the project report, however, shall have two more parts, namely, the layout of the thesis giving a brief chapter wise description of the work and the key words.

6. Table of Contents

The contents shall follow the Abstract and shall enlist the titles of the chapters, section and subsection using decimal notation, as in the text, with corresponding page number against them, flushed to the right.

7. & 8. List of Figures and Tables



Two separate lists of Figure captions and Table titles along with their numbers and corresponding page numbers against them shall follow the Contents.

9. Abbreviation Notation and Nomenclature

In general, no abbreviations should be used in the text except for technical terms. A complete and comprehensive list of all abbreviations, notations and nomenclature including Greek alphabets with subscripts and superscripts shall be provided after the list of tables and figures. (As far as possible, generally accepted symbols and notation should be used).

10. Introduction

The title of Chapter 1 shall be Introduction. It shall justify and highlight the problem posed, define the topic and explain the aim and scope of the work presented in the thesis. It may also highlight the significant contributions from the investigation.

11. Review of Literature

This shall normally form Chapter 2 and shall present a critical appraisal of the previous work published in the literature pertaining to the topic of the investigation. The extent and emphasis of the chapter shall depend on the nature of the investigation.

12. Report of Materials and Methods used in the Project work

The reporting on the investigation shall be presented in one or more chapters with appropriate chapter titles. Due importance shall be given to experimental setups, procedures adopted, techniques developed, methodologies developed and adopted.

While important derivations / formulae should normally be presented in the text of these chapters, extensive and long treatments, copious details and tedious information, detailed results in tabular and graphical forms may be presented in Appendices.

- Representative data in tables and figures may, however, be included in appropriate chapters.
- Figures and tables should be presented immediately following their first mention in the text. Short tables and figures (say, less than half the writing area of the

page) should be presented within the text, while large tables and figures may be presented in

separate pages.

- Equations should form separate lines with appropriate paragraph separation above and below the equation line, with equation numbers flushed to the right.

13. Results and Discussions

This shall form the penultimate chapter of the thesis and shall include a thorough evaluation of the investigation carried out and bring out the contributions from the study. The discussion shall logically lead to inferences and conclusions as well as scope for possible further future work.

14. Summary and Conclusions

This will be the final chapter of the thesis. A brief report of the work carried out shall form the first part of the Chapter. Conclusions derived from the logical analysis presented in the Results and Discussions Chapter shall be presented and clearly enumerated, each point stated separately. Scope for future work should be stated lucidly in the last part of the chapter.

15. Appendix

Detailed information, lengthy derivations, raw experimental observations etc. are to be presented in the separate appendices, which shall be numbered in Roman Capitals (e.g. "Appendix IV"). Since reference can be drawn to published / unpublished literature in the appendices these should precede the "Literature Cited" section.

16. References / Literature Cited

This should follow the Appendices, if any, otherwise the Summary and Conclusions Chapter. The candidates shall follow the style of citation and style of listing in one of the standard journals in the subject area consistently throughout his / her thesis, for example, IEEE in the Department of Electrical Engineering, Materials Transactions in Department of Metallurgical Engineering and Materials Science. However, the names of all the authors along with their initials and the full title of the article /monogram / book etc. have to be given in addition to the journals / publishers, volume, number, pages(s)and year of publication. Citation from websites should include the names(s) of author(s) (including the initials), full title of the article, website reference and when last accessed. Reference to personal communications, similarly, shall include the author, title of the communication (if any) and date of receipt.

Publications by the candidate, articles, technical notes etc. in the topic of the thesis published by the candidate may be separately listed after the literature cited. This may also be included in the

contents. The candidates may also include reprints of his / her publications after the literature citation.

Format for Entry in reference / Bibliography:

For paper published in Journal:

Name/s of Author/s, (Year of Publication), "Title of the paper", Title of the Journal,
Volume No, page no e.g.

Berny, J. (1889), "A new distribution function for risk analysis", Journal of the Operational Research Society, Vol. 40, pp.1121-7

For text/reference book:

Name/s of Author/s, (Year of Publication), Title of the book, Name of Publisher, Place e.g.

Canvas, G.C. (1984), Applied probability and statistical methods, Little, Brown & Company, Boston

For Thesis / Dissertation:

Name of the researcher, (Year of submission), Name of University, Place e.g.

Dey, P.K. (1997), "Symbiosis of organizational re-engineering for effective implementation of projects" Doctoral thesis, Jadhavpur University, Calcutta

17. Acknowledgements

The acknowledgments by the candidate shall follow the citation of literature, signed by him/her, with date.

1 THESIS FORMAT

1.1 Paper

1.1.1 Quality

The thesis shall be printed / xeroxed on white bond paper, whiteness 95% or above, weight 70 gram or more per square meter.

1.1.2 Size

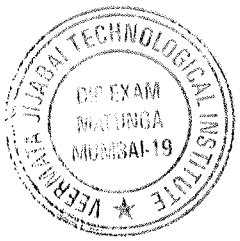
The size of the paper shall be standard A 4; height 297 mm, width 210 mm.

1.1.3 Type, Setting, Text Processing and Printing

The text shall be printed with Portrait orientation employing laser-jet or Inkjet printer, the text having been processed using a standard text processor. The standard font shall be Times New Roman of 12 pts with 1.5 line spacing and Justified alignment.

1.1.4 Page Format

The Printed Sheets shall have the following written area and margins: Top



Margin 15 mm

Head Height 3 mm

Head Separation 12 mm

Bottom Margin 22 mm

Footer 3 mm

Foot Separation 10 mm

Text Height 245 mm

Text Width 160 mm

When header is not used the top margin shall be 30 mm. Left and Right margins

The candidates shall have the options of single or double sided printing.

- Single sided/odd number page (in double sided printing) Left

  Margin 30mm

  Right Margin 20 mm

- Double sided even numbered page Left

  Margin 20mm

  Right Margin 30mm

1.1.5 Pagination

Page numbering in the text of the thesis shall be Hindu Arabic numerals at the center of the footer. But when the candidate opts for header style the page number shall appear at the right and left top corner for the odd and even number pages, respectively.

Page number "1" for the first page of the Introduction chapter shall not appear in print, only the second page will bear the number "2".

The subsequent chapters shall begin on a fresh page (fresh odd number page in case of double-sided printing). When header style is chosen the first page of each chapter will not have the header and the page number shall be printed at the center of the footer.

Pagination for pages before the Introduction chapter shall be in lower case Roman numerals, e.g., "iv".

1.1.6 Header

When the header style is chosen, the header can have the Chapter number and Section number (e.g., Chapter 2, Section 3) on even numbered page headers and Chapter title or Section title on the odd numbered page header.

1.1.7 Footer

The Footer shall contain title, student name and page numbers in following format

Report Title *Student Name* *Page Number*

1.1.8 Paragraph format

Vertical space between paragraphs shall be about 2.5 line spacing. The first line of each paragraph should normally be indented by five characters or 12mm. A candidate may, however, choose not to indent if (s) he has provided sufficient paragraph separation.

A paragraph should normally comprise more than one line. A single line of a paragraph shall not be left at the top or bottom of a page (that is, no windows or orphans should be left). The word at the right end of the first line of a page or paragraph should, as far as possible, not be hyphenated.

1.2 Chapter and Section Format

1.2.1 Chapter

Each chapter shall begin on a fresh page (odd number page in case of double sided printing) with an additional top margin of about 75mm. Chapter number (in Hindu Arabic) and title shall be printed at the center of the line in 6mm font size (18pt) in bold face using both upper and lower case (all capitals or small capitals shall not be used). A vertical gap of about 25mm shall be left between the Chapter number and Chapter title lines and between chapter title line and the first paragraph.

1.2.2 Sections and Subsections

A chapter can be divided into Sections, Subsections and Sub-subsections so as to present different concepts separately. Sections and subsections can be numbered using decimal points, e.g. 2.2 for the second section in Chapter 2 and 2.3.4 for the fourth Subsection in third Section of Chapter 2. Chapters, Sections and Subsections shall be included in the contents with page numbers flushed to the right. Further subsections need not be numbered or included in the contents.

The Section and Subsection titles along with their numbers in 5 and 4mm (16 and 14 pt) fonts, respectively, in bold face shall be flushed to the left (not centered) with 15 mm space above and below these lines.

In further subdivisions character size of 3 and 3.5 with bold face, small caps, all caps and italics may be used for the titles flushed left or centered. These shall not feature in the contents.

1.2.3 Table / Figure Format

As far as possible tables and figures should be presented in portrait style. Small size table and figures (less than half of writing area of a page) should be incorporated within the text, while larger ones may be presented on separate pages. Table and figures shall be numbered chapter wise. For example, the fourth figure in chapter 5 will bear the number Figure 5.4 or Fig 5.4

Table number and title will be placed above the table while the figure number and caption will be located below the figure. Reference for Tables and Figures reproduced from elsewhere shall be cited in the last and separate line in the table and figure caption,

e.g. (after McGregor [12]).

2 Auxiliary Format

2.1 Binding

The evaluation copies of the thesis / dissertation / report may be spiral bound or soft bound. The final hard bound copies to be submitted after the viva-voce examination will be accepted during the submission of report with the Maroon colour binding.

Typographical guidelines for Project Report:

Following is the suggestive format for preparing the Project report. Actual report may differ slightly depending upon the nature of project. The project report may contain the following

a) The project report shall be computer typed (English-British) and printed on A4 size paper.

b) Text Font -Times New Roman (TNR), Size-12 point

c) Subsection heading TNR- 12 point bold normal

d) Section heading TNR- 12 capital bold

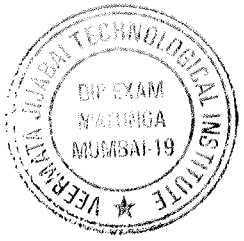
e) Chapter Name/ Topic Name – TNR- 14 Capital

f) All text should be justified. (Settings in the Paragraph)

g) The report must be typed with 1.5 spacing with a margin 3.5 cm on the left, 2.5 cm on the top, and 1.25 cm on the right and at bottom.

h) The project report must be hardbound in maroon colour. The name of the candidate, diploma (department), year of submission, name of the institute shall be printed on the cover [Refer sample sheet (outer cover)]

i) The training report, the title page should be given first then the Certificate followed by the acknowledgment and then contents with page numbers.



Specimen 'A': Title Sheet

Title of the diploma programme: (example)

Diploma in Textile Engineering (DTE)

Project Report Titled
(Title of the Report)

submitted in partial fulfillment of
the requirements of

Diploma in (branch)

by

(Name of the student)
(Registration number)

under the guidance of
(Name of the Supervisor)

(Name of the Department)

Veermata Jijabai Technological Institute

Mumbai 400 019

(Year of Submission)

Specimen `B' Declaration of the Candidate

Declaration of the Candidate

I declare that this written submission represents my ideas in my own words, where others' ideas or words have been included. I have adequately cited and referenced the original sources.

I also declare that I have adhered to all principles of academic honesty, integrity and have not misrepresented or fabricated or falsified any idea/ data/ fact/ source in my submission.

I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Signature of the candidate: _____

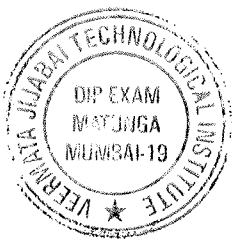
Name of the candidate: _____

Registration Number: _____

Date: _____

Specimen `C' Approval Sheet

CERTIFICATE



This is to certify that (Name of the Student), a student of (name of the Programme), has completed the Project report entitled "(Title of the project)" to our satisfaction.

The project report submitted by (Name of the student) is approved for the Diploma in (branch) Engineering (short form of branch).

(Name & Signature)
Supervisor

(Name & Signature)
External Examiner

(Name & Signature)
Co- Supervisor

(Name & Signature)
Head, Name of Department

Date:_____

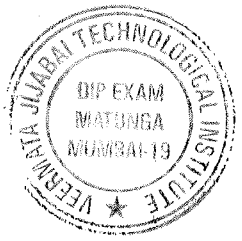
Place:_____

V. ASSESSMENTS METHODOLOGIES /TOOLS

1. Formative assessment (Assessment for Learning)

A. Suggestive RUBRICS for assessment

Academic year: 20___-20___



Title of the Project: _____

Marks: Max 100, Min 40

Based on the following criteria

Sr No	Criteria	Marks 100
1	Selection of Topic	10
2	Literature review and data collection	25
3	Quality of preparation during the Project period	15
4	Time Management	15
5	Innovativeness of the Topic	10
6	Stages of development of the action plan	25
5	Seminar Presentation report	10

Name of Supervisor: _____

Signature of Supervisor: _____

B. Suggestive RUBRICS for summative assessment

Academic year: 20___-20___

Title of the Project: _____

Marks: Max 100, Min 40

Based on the following

The summative assessment of the students shall be based on the Presentation of the Project at the End of the Term in the form of Powerpoint presentation, Project report and Assessment by the External Examiner. Out of the Total 100 marks 50 marks shall be allotted by the

Supervisor and 50 marks will be awarded by the External Examiner on the basis of the following criteria. The total marks of 20 shown in the column below shall be equally divided between the Supervisor and the External Examiner.

Sr No	Criteria	Marks 100
1	Quality of information/Knowledge/Creativity/Innovation presented in the Project Work.	20
2	Type of the project (Industrial / Practically implemented / Study etc.)	20
3	Response to the question during the presentation	20
4	Response to the question during seminar presentation	20
5	Quality / Timely submission of the Final Project report	20

Name of Supervisor: _____ Name of External Examiner: _____

Signature of Supervisor: _____ Signature of External Examiner: _____

VI. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)	
	PO-1 Basic an Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	3	3	1	-	-	3	3	2	-
CO2	3	3	1	-	-	3	3	2	-
CO3	-	-	-	-	-	3	3	-	-

Legends:- High:03, Medium:02,Low:01, No Mapping: -

PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.

PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

Curriculum Coordinator Head of the Department Dean Diploma

BOS VJTI Approval Dt. 23/05/2025

VEERMATA JIJABAI TECHNOLOGICAL INSTITUTE DIP EXAM MATUNGA MUMBAI-19