DIPLOMA IN ENGINEERING AND TECHNOLOGY

1

DEPARTMENT OF CIVIL ENGINEERING

F – SCHEME

DRAFT SYLLABUS

IMPLEMENTED FROM 2020 - 2021

SESHASAYEE INSTITUTE OF TECHNOLOGY
(Autonomous)
TIRUCHIRAPPALLI – 620 010.

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PREFACE

The wave of liberalization and globalization has created an environment for free flow of information and technology through fast and efficient means the world over. This has lead to shrinking of world, bringing people from different cultures and environment together, giving rise to a global village. A shift has been taking place in India from closed economy to knowledge based and opens economy. In order to cope-up with the challenges of handling new technologies, materials and methods, we have to develop human resources having appropriate knowledge, professional skills and attitude. Technical education system is one of the significant components for human resource development. Polytechnics play an important role in meeting the requirements of trained technical manpower for industries and field organizations. The initiatives being taken by to revise the curriculum as per the needs of the industry are laudable.

In order to meet the requirements of future technical manpower, constant efforts have to be made to identify new employment opportunities, carryout activity analysis and design need based curricula of diploma programmes. This curriculum document has been designed by identifying job potential and competency profile of diploma holders leading to identification of curriculum areas for the course. It is needless to emphasize that the real success of the diploma programme depends upon its effective implementation. This will require harnessing and effective utilization of resources. In addition to acquisition of appropriate physical resources, the availability of competent and qualified faculty is essential. It is time for the managers of technical education system to reorganize the system to accept the challenges of both quantitative and qualitative expansion of technical education.

There are various online training facilities created by the Government of India through MHRD for the benefit of both the Teaching and Student community. Facilities like Spoken-Tutorial, SWAYAM, NPTEL, e-Yantra must be exploited to its fullest extent to reap the benefits of interactive electronic media for teaching-learning process. It is hoped that polytechnics will carry out job market research on a continuous basis to identify the new skill requirements and develop innovative methods of course offering and thereby infuse dynamism in the system.

PRINCIPAL & CHAIRMAN

ACKNOWLEDGEMENTS

Coordinator

1. DEPARTMENT VISION, MISSION ,PO and PEOs

THE VISION AND MISSION OF THE DEPARTMENT

VISION:

To impart knowledge and excellence that brings out civil engineers with high technical competencies and promotes professional assignments to meet the current and future challenges in civil engineering.

MISSION:

- To promote activities that cultivates the spirit of entrepreneurship to the students.
- To impart quality education with moral values in emerging areas of employability skill.
- To create, disseminate and integrate knowledge of engineering, science and technology that expands the civil and environmental engineering knowledge base, which in turn enables the betterment of human society.
- To enrich and enhance the knowledge base for the best practices in various areas of Civil & allied Engineering
- To create competent professionals who are trained in the design and development of civil engineering systems and contribute towards need of industry requirements.

PROGRAM EDUCATIONAL OBJECTIVES:

- Students function effectively as civil engineering professional in industry, government or other organizations–designing, improving, leading and implementing efficient civil engineering practices.
- To inculcate in students professional and ethical attitude, effective communication skills and team work to become a successful Entrepreneur.
- To promote lifelong self learning abilities for gaining multidisciplinary knowledge through projects and industrial training to meet the social needs.

LIST OF PROGRAM OUTCOMES:

- Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

- Problem analysis: Identify and analyze well-defined engineering problems using codified standard methods.

- Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

- Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

- Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.

- Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

- Life-long learning: Ability to analyze individual needs and engage in updating in the context of technological changes.

Program Specific Outcomes (PSOs):

- The Graduates of this program with proficiency in Structural Design and drawing which will excel in the core areas of structural Design in civil Engineering.
- The Graduates of this Programme with proficiency in construction materials and technology produce detailed drawings, write specification, prepare cost estimates and prepare digital mapping and pursue higher studies in civil engineering.

2. R E G U L A T I O N S
DIPLOMA COURSES IN ENGINEERING
(TERM PATTERN)
(Implemented from 2020- 2021)
F– SCHEME
(Common to all Programmes)

2.1. Description of the Course:

a. Full Time (3 years):

The Programme for the Full Time Diploma in Engineering shall extend over a period of three academic years, consisting of 6 terms* and the First Year is common to all Engineering Branches.

b. Sandwich (3½ years):

The Course for the Sandwich Diploma in Paper Technology shall extend over a period of three and half academic years, consisting of 7 terms* and the First Year is common to all Engineering Branches. The subjects of three years full time diploma course being regrouped for academic convenience.

During 4th and/or during 7th term the students undergo industrial training for six months. Industrial training examination will be conducted after completion of every 6 months of industrial training.

* Each term will have 16 weeks duration of study with 35 hrs. / Week for Regular Diploma Courses.

2.2. Condition for Admission:

Condition for admission to the Diploma courses shall be required to have passed in The S.S.L.C Examination of the Board of Secondary Education, Tamil Nadu.

(Or)

The Anglo Indian High School Examination with eligibility for Higher Secondary Course in Tamil Nadu.

(Or)

The Matriculation Examination of Tamil Nadu.

(Or)

Any other Examinations recognized as equivalent to the above by the Board of Secondary Education, Tamil Nadu.

Note: In addition, at the time of admission the candidate will have to satisfy certainminimum requirements, which may be prescribed from time to time.

2.1. Admission to Second year (Lateral Entry):

A pass in HSC (academic) or (vocational) courses mentioned in the Higher

Secondary Schools in Tamil Nadu affiliated to the Tamil Nadu Higher Secondary Board with eligibility for University Courses of study or equivalent examination & Should have studied the following courses.

A pass in 2 Years ITI with appropriate Trade or Equivalent examination.

Sl. No	Courses	H.Sc Academic	H.Sc Vocational		Industrial Training Institutes Courses
			Subjects Studied		
		Studied any three of the following subjects	Studied any three of the following subjects	Vocational subjects	
1.	All the Regular and Sandwich Diploma Courses	Maths Physics Chemistry Computer Science Electronics Information Technology Biology Informatics Practices Bio Technology Technical Vocational subject Agriculture Engineering Graphics Business Studies Entrepreneurship	Maths Physics Chemistry Computer Science Electronics Information Technology Biology Informatics Practices Bio Technology Technical Vocational subject Agriculture Engineering Graphics Business Studies Entrepreneurship	Related Vocational Subjects Theory& Practical	2 years course to be passed with appropriate Trade

- For the Diploma Programmes related with Engineering/Technology, the related / equivalent courses prescribed along with Practical's may also be taken for arriving the eligibility.
- Programmes will be allotted according to merit through counselling by the Principal as per communal reservation.
  Candidates who have studied Commerce Courses are not eligible for Engineering Diploma programmes

2.3 Age Limit:

No Age limit **Medium of Instruction**:English

2.4 Eligibility for the Award of Diploma:

No candidate shall be eligible for the Diploma unless he/she has undergone the prescribed course of study for a period of not less than 3/3 ½ academic years (Full

Time/Sandwich), affiliated to the State Board of Technical Education and Training, Tamil Nadu, when joined in First Year and 2/2 ½ years (Full Time/Sandwich), if joined under Lateral Entry scheme in the second year and passed the prescribed examination.

The minimum and maximum period for completion of Diploma Programmes are given below:

Diploma Programmes	Minimum Period	Maximum Period
Full Time	3 Years	6 Years
Full Time (Lateral Entry)	2 Years	5 Years
Sandwich	3½ Years	6½ Years
Sandwich (Lateral Entry)	2½ Years	5½ Years

This will come into effect from F Scheme onwards i.e. from the academic year 2020-2021.

2.5 Programmes of Study and Curriculum outline

The Programmes of study shall be in accordance with the syllabus prescribed from time to time, both in theory and practical courses.
The curriculum outline is given in Annexure – I.

2.6 Examinations:

Autonomous Examinations in all Programmes of all the terms under the scheme of examinations will be conducted at the end of each term.

The internal assessment marks for all the courses will be awarded on the basis of continuous assessment earned during the term concerned. For each course, 25 marks are allotted for internal assessment. Autonomous Examinations areconducted for 100 marks and reduced to 75.

The total marks for result are 75 + 25 = 100 Marks.

2.7 Continuous Internal Assessment:

A.   For Theory Courses:

The Internal Assessment marks for a total of 25 marks, which are to be distributed as follows:

i) Course Attendance: 05 Marks

(Award of marks for subject attendance to each subject Theory/Practical will be as per the range given below)

80% - 83%	1 Mark
84% - 87%	2 Marks
88% - 91%	3 Marks
92% - 95%	4 Marks
96% - 100%	5 Marks

i) Test: **10 Marks**

Two Tests each of 2 hours duration for a total of 50 marks are to be conducted. Average of these two test marks will be taken and the marks to be reduced to:

05 Marks

The Test – III is to be the Model Examination covering all the five units and the marks obtained will be reduced to:

05 Marks

Test	Units	When to conduct	Marks	Duration
Test I	Unit – I & Half of unit-II	End of 6th week	50	2Hrs
Test II	Remaining Half of unit II & III	End of 12th week	50	2Hrs
Test III	Model examination: Covering all the units.(Autonomous examinations-Question paper-pattern)	End of 16th week	100	2Hrs

From the Academic Year 2020 – 2021 onwards:

Question Paper Pattern for the Cycle Test :(Test - I & Test- II):
Part A
Type questions (Any 4 out of 6 questions):
4 Questions ✗ 2 mark   08 marks
Part B
Type questions (Any 4 out of 6 questions):
4 Questions ✗ 3 marks   12 marks
Part C
Type questions (Either or):
3 Questions ✗ 10 marks   30 marks
Total   **50 marks**
Assignment   **10 Marks**
Written Assignment   **-**   **4 marks**
Multiple Choice Questions   **-**   **3 marks**
Seminar Presentation   **-**   **3 marks**
Total   **-**   **10 Marks**

iii) Assignment   **4 Marks**

For each course Two Assignments are to be given each for 10 marks and the average marks scored should be reduced for 4 marks.

iv) Multiple Choice Questions   **3 Marks**

For each course one MCQ test are to be given each for 30 marks and the averagemarks scored should be reduced for 3 marks.

v) Seminar Presentation   **3 Marks**

The students have to select the topics either from their course or general courses which will help to improve their grasping capacity as well as their capacity to express the subject in hand. The students will be allowed to prepare the material for the given topic using the library hour and they will be permitted to present seminar (For First and Second Year, the students will be permitted to present the seminar as a group not exceeding six members and each member of the group should participate in the presentation. For the Third Year, the students should present the seminar individually.) The seminar presentation is mandatory for all

Theory courses and carries 3 marks for each theory course. The respective course faculty may suggest topics to the students and will evaluate the submitted materials and seminar presentation. (1 ½ marks for the material submitted in writing and 1 ½ marks for the seminar presentation). For each subject minimum oftwo seminars are to be given and the average marks scored should be reduced to3 marks.

All Test Papers, Assignment Papers / Notebooks and the seminar presentation written material after getting the signature with date from the students must be keptin safe custody in the department for verification and audit. It should be preservedfor one term after publication of Board Exam results and produced to the flying squad and the inspection team at the time of inspection/verification.

B.   For Practical Subjects:
The Internal Assessment mark for a total of 25 marks which are to be distributed as follows:-

a.   Attendance   :5 Marks

    (Award of marks same as theory subjects)

b.   Procedure/ observation and tabulation/Other Practical related Work :10 Marks

c.   Record writing   :10 Marks

TOTAL   **:25 Marks**

•   All the Experiments/Exercises indicated in the syllabus should be completed and the same to be given for final Board examinations.

•   The observation note book / manual should be maintained for 10 marks. The

observation note book / manual with sketches, circuits, programme, reading and calculation written by the students manually depends upon the practical subject during practical classes should be evaluated properly during the practical class hours with date.

- The Record work for every completed exercise should be submitted in the subsequent practical classes and marks should be awarded for 10 marks for each exercise as per the above allocation.

- At the end of the term, the average marks of all the exercises should be calculated for 20 marks (including Observation and Record writing) and the marks awarded for attendance is to be added to arrive at the internal assessment mark for Practical. (20+5=25 marks).

- Only regular students, appearing first time have to submit the duly signed bonafide record note book/file during the Practical Board Examinations.

All the marks awarded for Assignments, Tests, Seminar presentation and Attendance should be entered periodically in the Personal Theory Log Book of the staff, who is handling the theory subject.

The marks awarded for Observation, Record work and Attendance should be entered periodically in the Personal Practical Log Book of the staff, who is handling the practical subject.

Communication Skill Practical, Computer Application Practical and Physical Education:

The Communication Skill Practical and Computer Application Practical with more emphasis are being introduced in First Year. Much Stress is given to increase the Communication skill and ICT skill of students. As per the recommendation of MHRD and under Fit India scheme, the Physical education is introduced to encourage students to remain healthy and fit by including physical activities and sports.

2.8 Project Work and Internship:
The students of all the Diploma Programme have to do a Project Work as part of the Curriculum and in partial fulfilment for the award of Diploma by the State Board of Technical Education and Training, Tamil Nadu. In order to encourage students to do worthwhile and innovative projects, every year prizes are awarded for the best three projects i.e. institution wise, region wise and state wise. The Project work must be reviewed twice in the same term. The project work is approved during the V term by the properly constituted committee with guidelines.

a)   Internal assessment mark for Project Work & Internship:

Project Review I	**10 Marks**
Project Review II	**10 Marks**
Attendance	**05Marks**(Award of marks same as theory subject pattern)
Total	**25 Marks**

Proper record should be maintained for the two Project Reviews and preserved for one term after the publication of Board Exams results. It should be produced to theflying squad and the inspection team at the time of inspection/verification.

b)   Allocation of Marks for Project Work & Internship in Board Examinations:

Demonstration/Presentation   25 marks
Report   25 marks
Viva Voce   30 marks
Internship Report   20 marks
TOTAL   100* MARKS

Examination will be conducted for 100 marks and will be converted to 75 marks.

c)   Internship Report:

The internship training for a period of two weeks shall be undergone by every candidate at the end of IV / V term during vacation. The certificate shall be produced along with the internship report for evaluation. The evaluation of internship training shall be done along with final year "Project Work & Internship" for 20 marks. The internship shall be undertaken in any industry / Government or Private certified agencies which are in social sector / Govt. Skill Centres / Institutions / Schemes.

A neatly prepared PROJECT REPORT as per the format has to be submitted by individual student during the Project Work & Internship Boardexamination.

2.9 Scheme of Examinations:

The Scheme of examinations for courses is given in Curriculum outline

2.10. Criteria for Pass:

- No candidate shall be eligible for the award of Diploma unless he/she has

undergone the prescribed course of study successfully in an institution approved by AICTE and affiliated to the State Board of Technical Education & Training, TamilNadu and pass all the subjects prescribed in the curriculum.

- A candidate shall be declared to have passed the examination in a course if he/she secures not less than *40% in theory subjects and 50%in practical subjects* out of the total prescribed maximum marks including both the Internal Assessment and the Autonomous Examinations marks put together, course to the condition that he/she secures at least a *minimum of 40 marks out of 100 marks in the Autonomous Theory Examinations and a minimum of 50 marks out of 100 marks in the Autonomous Practical Examinations*.

2.11 Classification of successful candidates:

Classification of candidates who will pass out the final examinations from April 2023 onwards (Joined first year in 2020 -2021) will be done as specified below.

First Class with Superlative Distinction:

A candidate will be declared to have passed in *First Class with Superlative Distinction* if he/she secures not less than 75% of the marks in all the courses and passes all the terms in the first appearance itself and passes all courses within the stipulated period of study 2 / 3 / 3½ years [Full time (lateral entry)/Full Time/Sandwich] without any break in study.

First Class with Distinction:

A candidate will be declared to have passed in *First Class with Distinction* if he/she secures not less than 75% of the aggregate marks in all the terms put together and passes all the terms except the I and II term in the first appearance itself and passes all courses within the stipulated period of study 2 / 3 / 3½ years [Full time(lateral entry)/Full Time/Sandwich] without any break in study.

First Class:

A candidate will be declared to have passed in *First Class* if he/she secures not less than 60% of the aggregate marks in all the terms put together and passes all the courses within the stipulated period of study 2 / 3 / 3½ years [Full time(lateral entry)/Full Time/Sandwich] without any break in study.

Second Class:

All other successful candidates will be declared to have passed in *Second Class*. The above classifications are also applicable for the Sandwich students who pass out Final Examination from October 2023 /April 2024 onwards (both joined First Year in 2020 -2021).

2.12. Duration of a period in the Class Time Table:

The duration of each period of instruction is 1 hour and the total period of instruction hours excluding interval and lunch break in a day should be uniformly maintained as 7 hours corresponding to 7 periods of instruction (Theory & Practical).

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SALIENT FEATURES OF THE DIPLOMA PROGRAMME IN CIVIL ENGINEERING

1. Name of the Programme   : Diploma in Civil Engineering

2. Duration of the Programme   : Three years

3. Entry Qualification   : S.S.L.C or prescribed by Directorate Technical Education and Lateral Entry in Second Year Admission for Plus-two Students.

4. Intake   : 60+12

5. Pattern of the Programme   : Term Pattern(I to VI)

6. Ratio between Theory &Practical : 50:50(Approx.)

EMPLOYMENT OPPORTUNITIES

Employment opportunities for diploma in Civil Engineering are visualized in following industrial at various levels / positions.

a. In Govt. Sectors -

    PWD (Buildings, Irrigation), CPWD

    Housing Board,

    State Highways, National Highways

    Railways,

    TWAD Board,

    Environmental and Pollution Control board

    Slum clearance board

    Police Housing Department

    Telecommunication

    Electricity Board

b. In Pvt. Sectors -

    Larsen & Turbo

    Larsen & Turbo (Hydrocorbon)

    Nardril rebar detailing

    Rebar detailing

    M.D.S Rebar Detailing

    Technip

    Indomer

    Woods land Detailing

    Cad's software pvt ltd.

c. Research Organizations like CSIR, ISRO etc.

d. Entrepreneurs in Planning, Estimating, Design, and Civil Contractor, consultants etc.

Various designations for diploma holders in Civil Engineering are given as follows

1. Junior Engineer
2. Technical Assistant
3. Supervisor
4. Draughtsman
5. Maintenance Engineer
6. Planner
7. Consultant
8. Estimator
9. Builder
10. Contractor
11. Designer
12. Instructor
13. Marketing Executive, etc..

COMPETENCY PROFILE

Keeping in view the employment opportunities of diploma holders in Civil engineering   the course is aimed at developing following knowledge and skills in the students:

1. Basic understanding of concepts and principles of civil engineering so as to enable the students to apply the knowledge.

2. Development of communication and interpersonal skills for effective functioning in the world of work.

3. Ability to read and interpret drawings related to Civil Engg.

4. Knowledge of various materials used in Civil Engg., their properties and specifications.

5. Ability to prepare plan, section and elevation of a building, bridge drawing and structural drawing.

6. Ability to calculate the estimate of the Building& Bridges etc.

7. Ability to Design the R.C.C. Structures and Steel Structures.

8. Appreciation of the need of clean and green environment and its deterioration by various emissions from industry and preventive procedures and knowledge of safety regulations.

9. Development of generic skills of thinking and problem – solving, communication attitudes and value system for effective functioning in construction side.

10. Understanding of the basic principles of managing men, material and machines / equipment for construction of buildings and others.

11. Proficiency in the use of computers.

12. Basic manual and machining skills for maintaining the quality of materials.

13. Knowledge of properties of materials used for construction.

14. Development of good personality in order to have effective communication and business ethic.

15. Holistic development with happiness and prosperity for human harmony.

CURRICULUM AREAS AS DERIVED FROM COMPETENCY PROFILE

The following curriculum areas have been derived based on competency profile.

Sl.No.	Competency profile	Curriculum Areas / Subjects
1	Basic understanding of concepts and principles related to applied sciences like physics, chemistry and mathematics.	physics chemistry mathematics
2	Development of communication and inter personal skill for effective functioning in the world of work.	Communication skills
3	Understanding of basic concepts and principles of mechanical, electrical and civil engineering.	Mechanics of solids General workshop practice
4	Ability to read and interpret drawings related to civil Engg. Etc,	Engineering drawing Building planning and drawing
5	Understand basic concepts and principles in hydrostatics, hydro- kinematics and hydrodynamics and their application in solving fluid flow problems	Hydraulics
6	Integrating Men and materials for Quality construction and maintenance of buildings	Project Management with MIS
7	Identify Quality of various materials used and construction Techniques in Civil Engg.	Construction materials and Construction Practice
8	Knowledge of Civil Engg. Works in Transport(Road ways, Rail ways etc.,)	Transportation Engg.
9	Knowledge Of Planning Of Buildings And Other Structures.	Civil Engineering Drg.-I Cad in Civil Engg. Drg.-I Civil Engineering Drg.-II Cad in Civil Engg. Drg.-II
10	Proficiency in the use of computers	Computer Applications In Civil Engineering Cad in Civil Engg. Drg.I& II
11	Ability to Analysis and Design the Structures(RCC & STEEL)	Theory of structures(SOM& MOS) Structural Engineering Structural Design
12	Prepare material estimates and cost estimates for various Civil Engineering works, basic knowledge regarding analysis of rates and contracting principles of valuation	Estimation, Costing and Valuation

13	Knowledge of earth's surface and calculation of areas and volumes of land.	Surveying I &II including contours
14	Appreciation of the need of clean and green environment and its deterioration by various emissions from industries and traffics in roads of preventive procedures & impurities of water.	Environmental Engg. & Pollution control.
15	Development of generic skills of thinking and problem-solving, communication, attitudes and value system for effective recruitment in placement.	Industrial visits Project work Communication Skills &Aptitude class
16	Understanding of the basic principles of managing men, material and machines / equipment for optimum production	Entrepreneurship Management & Project Management with MIS
17	Holistic development with real understanding, relationship with human being for mutual happiness and physical facility with rest of nature for mutual prosperity leads to harmony.	Universal Human Values

7. CURRICULUM OUTLINE & SCHEME OF EXAMINATION

III TERM

Sl. No.	Course Code	Course	Abbre viation	Hours per week					Scheme of examination			Minimum mark for pass	Duration of exam (Hours)
				TH	TU	P	Total Hours	C	Internal	External	Total		
1	1F3201	Mechanics of solids	MOS	6			6	6	25	100	100	40	3
2	1F3202	Construction Materials and construction practice	CMCP	5			5	5	25	100	100	40	3
3	1F3203	Surveying	SUR	6			6	6	25	100	100	40	3
4	1F3204	Building planning and drawing	BP&D			4	4	2	25	100	100	50	3
5	1F3401	Civil engineering drawing and CAD Practical -I	CAD in CED-I			4	4	2	25	100	100	50	3
6	1F3205	Material testing laboratory-I	MT-I			3	3	2	25	100	100	50	3
7	1F3206	Surveying Practice-I	SP-I			4	4	2	25	100	100	50	3
				17		15	32	25					
		Physical Education	PE				2						
		Library	LIB				1						
		Total					35	25	25	100	100	-	-

*External Marks are conducted for 100 Marks and converted to 75 Marks
Abbr- ABBREIVIATION TH –THEORY TU – TUTORIAL P – PRACTICAL C – CREDIT

IV –TERM

| Sl. No. | Course Code | Course | Abbreviation | Hours per week | | | | | Scheme of examination | | | Minimum mark for pass | Duration of exam (Hours) |
				TH	TU	P	Total Hours	C	Internal	External	Total		
1	1F4301	Theory of structures	TOS	6			6	6	25	100	100	40	3
2	1F4207	Hydraulics	HYD	6			6	6	25	100	100	40	3
3	1F4302	Transportation Engineering	TE	5			5	5	25	100	100	40	3
4	1F4208	Hydraulics Laboratory	HL			4	4	2	25	100	100	50	3
5	1F4303	Material Testing Laboratory-II	MT-II			3	3	2	25	100	100	50	3
6	1F4304	Construction Practice Laboratory	CPL			4	4	2	25	100	100	50	3
7	1F4305	Surveying Practice-II	SP-II			4	4	2	25	100	100	50	3
				17		15	32	25					
		Physical Education	PE				2						
		Library	LIB				1						
		Total					**35**	**25**	**25**	**100**	**100**		
8	1F0006	Universal Human values	UHV**					5					

*External Marks are conducted for 100 Marks and converted to 75 Marks
Abbr- ABBREIVIATION   TH –THEORY TU – TUTORIAL   P – PRACTICAL   C – CREDIT
** The total hours allotted for taking CCD is 75 Hrs and will be handled with flexible timings

V- TERM

Sl. No.	Course Code	Course	Abbreviation	Hours per week					Scheme of examination			Minimum mark for pass	Duration of exam (Hours)
				TH	TU	P	Total Hours	C	Internal	External	Total		
1	1F5306	Structural Engineering	SE	6			6	6	25	100	100	40	3
2	1F5307	Environmental Engineering	EE	5			5	5	25	100	100	40	3
		Elective Theory-I		5			5	5	25	100	100	40	3
3	1F5308.1	Remote sensing and Geo informatics	RS& GIS										
4	1F5308.2	Concrete Technology	CT										
5	1F5308.3	Geotechnical Engineering	GE										
6	1F5402	Civil Engineering Drawing and CAD Practical-II	CAD in			6	6	3	25	100	100	50	3
7	1F5309	Environmental Engineering Laboratory	EEL			3	3	2	25	100	100	50	3
		Elective Practical-I				3	3	2	25	100	100	50	3
	1F5310.1	Advanced surveying and Basic GIS Practical	AS& BGIS										
	1F5310.2	Concrete technology Practical	CTP										
	1F5310.3	Geotechnical Engineering Laboratory	GEL										
	1F5501	Entrepreneurship and startup	ES			4	4	2	25	100	100	50	3
		Physical Education	PE				2						
		Library	LIB				1						
		Total		16		16	35	25	25	100	100	-	-
8	1F0007	Concurrent career	CCD**					5					

*External Marks are conducted for 100 Marks and converted to 75 Marks

Abbr- ABBREIVIATION   TH –THEORY TU – TUTORIAL   P – PRACTICAL   C – CREDIT

** The total hours allotted for taking UHV is 75 Hrs and will be handled with flexible timings

VI –TERM

Sl. No.	Course Code	Course	Abbreviation	Hours per week					Scheme of examination			Minimum mark for pass	Duration of exam (Hours)
				TH	TU	P	Total Hours	C	Internal	External	Total		
1	1F6311	Construction Management	CM	6			6	6	25	100	100	40	3
2	1F6209	Estimation, Costing and Valuation	EC&V	6			6	6	25	100	100	40	3
3		**Elective Theory-II**		5			5	5	25	100	100	40	3
	1F6312.1	Sustainable and Green Building Technology	S&GBT										
	1F6312.2	Urban Planning and Development	UP&D										
	1F6313.3	Water Resources Engineering	WRE										
4	1F6403	Computer Applications in Civil Engineering Practice	CACEP			5	5	3	25	100	100	50	3
5		**Elective Practical-II**				4	4	2	25	100	100	50	3
	1F6313.1	Estimation and Costing Laboratory	E&CL										
	1F6313.2	Highway Engineering Laboratory	HEL										
	1F6313.3	Water Resources Engineering Laboratory	WREL										
6	1F6404	Project work and Internship	PWI			6	6	3	25	100	100	50	3
7		Physical Education	PE				2						
8		Library	LIB				1						
		Total		17		15	35	25	25	100	100	-	-

*External Marks are conducted for 100 Marks and converted to 75 Marks

Abbr- ABBREIVIATION TH –THEORY TU – TUTORIAL P – PRACTICAL C – CREDIT

EQUIVALENT PAPERS OF

E - SCHEME to F- SCHEME

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10

1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

EQUIVALENT PAPERS OF E SCHEME TO F SCHEME EQUIVALENT PAPERS

E-SCHEME		F-SCHEME	
III TERM			
SUB CODE	COURSE	SUB CODE	COURSE
1E3201	Engineering Mechanics	1F3201	Mechanics of Solids
1E3202	Construction Materials and construction Practice	1F3202	Construction Materials and Construction Practice
1E3203	Surveying-I	-	NO RELAVENT PAPER
1E3204	Hydraulics	1F4207	Hydraulics(IV Term)
1E3205	Civil Engineering Drawing I	1F3404	Building Planning and Drawing
1E3206	Materials Testing Lab– I And Hydraulics Lab	-	NO RELAVENT PAPER
1E3207	Survey Practical – I	1F3206	Surveying Practice –I
IV TERM			
1E4301	Mechanics of structure	1F4301	Theory of Structures
1E4302	Transportation Engineering	1F4207	Transportation Engineering
1E4303	Surveying –II	-	NO RELAVENT PAPER
1E4208	Estimating And Costing I	-	NO RELAVENT PAPER
1E4304	Material Testing Lab-II	1F4303	Material Testing Laboratory–II
1E4305	Survey Practical-II	1F4304	Surveying Practice –II
1E4401	Cad In Civil Engineering Drawing I	1F3401	Civil Engineering Drawing Cad Practical- I(III Term)

V TERM			
1E5306	Structural Engineering	1F5306	Structural Engineering
1E5307	Environmental Engg. & Pollution Control	1F5307	Environmental Engineering
1E5308.1	Elective Theory-I **WATER RESOURCE MANAGEMENT**	1F6312.3	Water Resources Engineering (VI Term)
1E5309	Civil Engineering Drawing II	-	NO RELAVENT PAPER
1E5310	Environmental Engg. & Plumbing Lab	-	NO RELAVENT PAPER
1E5402	Cad In Civil Engg. Drawing II	-	NO RELAVENT PAPER
1E5403	Life And Employability Skill Practical	-	NO RELAVENT PAPER
VI TERM			
1E6311	Project Engg. Mgt. With MIS	1F6311	Construction Management
1E6312	Estimating And Costing-II	-	NO RELAVENT PAPER
1E6313.1	Elective Theory-II **REPAIRS&REHABILITATI ON STRUCTURE**	-	NO RELAVENT PAPER
1E6314	Structural Design & Drag.	-	NO RELAVENT PAPER
1E6404	Comp.Appls. In Civil Engg.	-	NO RELAVENT PAPER
1E6315	Construction Practice Lab	-	NO RELAVENT PAPER (IV Term)
1E6405	Project Work With Entrepreneurship & Disaster	-	NO RELAVENT PAPER

DETAILS OF ADDITION

/

DELETION OF SUBJECTS

COMPARISON BETWEEN E-SCHEME (AUTONOMOUS) AND F-SCHEME (AUTONOMOUS)

SUBJECT- AUTONOMOUS (E-SCHEME)	SUBJECT- AUTONOMOUS (F-SCHEME)	COMPARISION
III-TERM Theory(4):	**III-TERM** Theory(3):	
Engineering Mechanics	**Mechanics of Solids**	**Addition:** NIL **Deletion:** Stresses in the materials - Problems on axially loaded composite sections like RC.C / Encased columns. **PRINCIPAL STRESSES AND STRAINS:** Introduction – Principal planes – Principal stresses – Principal strains – member subjected to direct stress in one plane – Two planes – mohr's circle - theory only.
Construction Materials and Construction Practice	**Construction Materials and Construction Practice**	**Addition:** **2.8 CLAY AND CEMENT CONCRETE BLOCKS** Porotherm blocks, CSE (Compressed stabilized earth blocks-IS2222/1991 AAC Blocks, Solid blocks, paver blocks, testing of blocks(IS2185/1979,PART-1) **Deletion:** **CERAMIC PRODUCTS:** Definition – Earthenware , Stoneware , Porcelain , Terracotta, Glazing, Tiles(Definitions only) – Types of Tiles – Clay Terracing tiles – Thermal care tiles – Glazed Ceramic tiles – Fully Vitrified tiles – Roof tiles special requirements for floor, wall and roof tiles– Sanitary appliances **GEOSYNTHETICS:** Introduction-uses in civil engineering-classification-

		properties of geo-textiles-uses in embankments.
		Physical requirements – Use of light weight aggregates -Hollow concrete (Hollow Block) masonry –Construction of walls– Advantages of hollow concretes masonry.

Surveying-I	**Surveying**	**Note: The course Surveying-I and II in E scheme is combined together as surveying in F scheme** **Addition:** Types of Maps, Differential maps- Hand held GPS Receiver - Function Field procedure - Observation and processing applications in Civil Engineering. **Deletion:** **CHAIN SURVEYING:** Plane and Geodetic surveying- chaining on sloping ground - Probable obstacles met with in chain surveying - Errors and corrections in chain surveying - Errors and corrections in chains and tapes - Problems. **COMPASS SURVEYING:** Local attraction - Detection and correction - problems. Plotting a Compass traverse - closing error and its adjustment – problems only. **APPLICATIONS OF LEVELLING :** Types of levelling - Check levelling : Definition, Field Procedure and use - Profile levelling or Longitudinal section(L.S) : Definition, use, field procedure and plotting the profile - Cross-sectional levelling(C.S) : Definition, use, field procedure and plotting the cross-section - Specimen field book for L.S and C.S - Reciprocal levelling : Definition, use and problems on difference in elevation - Curvature and Refraction : Effects, correction and problems - Errors in levelling - Fundamental lines and desired relationship between them - Permanent adjustments of a dumpy level : Process Use of Abney level and Planimeter.

		GLOBAL POSITIONING SYSTEM & AERIAL SURVEY:
		Need & purpose of GPS- GPS Frequency – Satellite constellation – GPS component. Aerial Survey -Introductions-definition-Aerial photograph-types- Application of aerial survey.
Hydraulics	**Hydraulics Shifted to IV Term**	----------------

III-TERM Practical (3):	III-TERM Practical (4):	**Addition:**
Civil Engineering Drawing-I	**Building Planning and Drawing**	**BUILDING BYE-LAWS AND SUBMISSION OF DRAWINGS**: Objects of bye-laws- Importance of bye-laws- Function of local authority- Setbacks- Plot Coverage- Number of floors- Height of building- Built up Area- Floor space index (FSI) - Views and details necessary for the preparation of a civil engineering drawing- Site Plan – Necessity for Approval of plans from local body- Layout plan and key plan- Requirements for submission of drawing for approval- Rules and bye- laws of sanctioning authorities for construction work. Furniture arrangement in each room- Position of stairs / lifts- Position of Doors/Windows House drainage and Sanitary fittings — Sump/Water tanks- Plumbing Pipes -Preparation of line drawing for given requirements with dimensions, not to scale. **PLANNING OF INDUSTRIAL STRUCTURES** Planning aspects - Requirements of industrial units - Sheets for pitched roof coverings — Rolling Shutters - Ramps- Stores- Public Toilets/ Bath rooms- Dining / Resting halls- Ventilation and Lighting - Preparation of line drawing for given requirement with measurements (not to scale). **PLANNING OF PUBLIC BUILDINGS** Types of public buildings - Miscellaneous public buildings - General requirements of Public Buildings -Landscape architecture-Preparation of line

		plan with dimensions for the given requirements (not to scale).
		PERSPECTIVE DRAWING (NOT FOR EXAM)
		Definition, Types of Perspective, terms used in perspective drawing, Perspective drawing
		Two Point Perspective of small objects only such as steps, monuments, pedestals
		BASIC DRAWINGS
		Fully paneled double leaf door.
		Fully Paneled single leaf door
		Fully Paneled window with grill
		Partly glazed and partly paneled window
		BUILDING DRAWINGS
		A reading room with RCC flat roof
		A Two roomed house with RCC slope roof with gable ends
		A Bank building with R.C.C flat roof.
		A Two storied Bungalow (Not for Exam)
		Deletion:
		Terms used in drawing as per NBC-Open space requirements as per NBC Building requirements-Minimum dimensions as per NBC-FAR and floor space index(FSI) for different buildings and zones-Municipal bye-laws-List of documents to be submitted for building plan approval Drawing instrument and their uses –Scales-Selection of scales-French curves-Scanners and Plotters-Abbreviations used in civil engineering drawing. Apartment- Framed Structure (Assignment purpose)
		Apartment- Framed Structure (Assignment purpose)
Materials Testing Lab– I And Hydraulics Lab	**Material Testing Laboratory– I**	**NOTE: Material Testing Lab-I and Hydraulics Lab in E scheme is split up into Material Testing Lab-1 in III Term and Hydraulics Lab in IV Term.** **Addition:**

		Compression Test on Wooden cube.
		Deflection test on wood.
		Demonstration of Strain gauges and Strain indicators.
		Demonstration of Soundness test on cement by auto clave method.
		Tension test on deformed steel bar.
		Deletion: Nil
Survey practical – I	**Surveying Practice –I**	**Addition: GLOBAL POSITIONING SYSTEM (GP)** Altitude using hand held GPS. Selection and marking of routings (Way points) using hand held GPS. **Deletion:** Ranging a chain line – taking offset. Chain traversing (Field work-around a building and Plotting) Obstacles to chaining but not ranging. Area of a plot (One base line and at least two offsets on either side).
-----	**Civil Engineering Drawing and CAD Practical – I**	**NOTE: In E scheme the CAD in Civil Engineering Drawing -I is in IV Term, now it is moved to III Term without any Addition and Deletion.**
IV-TERM Theory(3):	**IV-TERM Theory(3):**	
Mechanics of Structures	**Theory of Structures**	**Addition:** Nil **Deletion:** Nil
Transportation Engineering	**Transportation Engineering**	**Addition:** Advanced parking Technique in II unit **Deletion:** Nil
Surveying-II	**Surveying (III term)**	**NOTE: The course Surveying-I and II in E scheme is combined together as surveying in F scheme.**

		Addition: Nil **Deletion:** Fundamental lines and relationship between them Reading bearing of a line – Theodolite traversing – Methods – Field checks in closed traverse - Latitude and departure – Consecutive coordinates-Independent coordinates–Problems on computation of area of closed traverse–Balancing the traverse- Omitted measurements–Problems Distomats(Description only)–Direct reading tachometers-Determination of constants of a tachometer: Problems – Tachometric traverse – Errors in tachometric surveying **3.1 TRIGONOMETRICAL LEVELLING:** Introduction–Finding elevation of objects–Base accessible- Base inaccessible: Single Plane and Double Plane methods– Problems on determination of elevation of objects. Remote sensing – Definition – Basic Process – Methods of remote sensing–Applications-Photogrammetric Surveying– Definition–Terrestrial and Aerial photographs–Applications- **4.CURVES** Introduction – Types of curves – Designation of curves –Elements of simple circular curve–Setting out simple circular curve by: Offsets from long chords, Offsets from tangents, Offsets from chords produced and Rankin'smethod of deflection angles–Simple problems–Transition curves : Objectives–Vertical curves : Definition and types. Field procedure for co-ordinate measurement–Field procedure to run a traverse survey- Linking data files for Various Applications. **5.2GEOGRAPHICAL INFORMATION SYSTEM(GIS)** Introduction–Geographical information–Development of GIS– Components of GIS – Steps in GIS mapping - Ordinary mapping to GIS – Comparison of

		GIS with CAD and other system–Fields of Applications: Natural resources, Agriculture, Soil, Water resources, Waste land management and Social resources –Cadastral survey and Cadastral records – Land Information System(LIS)
------	**Hydraulics**	**Addition:** Nil **Deletion:** Nil
Estimating costing-I	**Estimating and costing**	**NOTE: The course Estimating and costing-I and II in E scheme is combined together as Estimating, costing and valuation in F scheme.** **Addition:** NIL **Deletion:** Necessity of Estimates- Importance of fair estimation- Duties and requirements of a good Quantity Surveyor, Stages in Detailed Estimation.
IV-TERM Practical (3):	**IV -TERM Practical (4):**	**Addition:** Determination of Chloride in the given sample water.
Material Testing Lab-II	**Material Testing Laboratory–II**	**Deletion:** Determination of workability of concrete by slump cone test. Determination of workability of concrete by compaction factor test. Casting of concrete cube and compression test on concrete cube.
-------	**Hydraulics Laboratory**	**Addition:** Flow through Orifice meter – Determination of Co-efficient of Discharge. Reciprocating pump – To draw characteristic curves and determine the efficiency Centrifugal pump – To draw characteristic curves and determine the efficiency Study of working principle of a Pelton wheel. **Deletion:** NIL
-------	**Construction Practice Laboratory**	**NOTE: In E scheme the Construction Practice Laboratory was in VI Term, now it is moved to IV Term.**

		Addition:
		Identify various sizes of available coarse aggregates from sample of 10 kg in laboratory and prepare report (60,40, 20,10 mm)
		Identify the available construction materials in the laboratory on the basis of their sources.
		Identify the grain distribution pattern in given sample of teak wood in the laboratory and draw the various patterns. (along and perpendicular to the grains)
		Identify various layers and types of soil in foundation pit by visiting at least 3 construction sites in different locations of city and prepare report consisting photographs and samples.
		Select first class, second class and third class bricks from the stake of bricks and prepare report on the basis of its properties.
		Measure dimension of 10 bricks and find average dimension and weight.
		Perform field tests - dropping, striking and scratching by nail and correlate the results obtained.
		Apply the relevant termite chemical on given damaged sample of timber.
		Apply two or more coats of selected paint on the prepared base of a given wall surface for the area of 1m x 1m using suitable brush/ rollers adopting safe practices.
		Prepare mortar using cement and Sand/ Fly ash or Granite/marble polishing waste in the proportion 1:6 or 1:3.
		Deletion:
		Demonstration and practice of painting, varnishing and polishing
		Casting and testing of small R.C beams
		Calculation of areas centering of the following (Given sketch)
		    a) Roof slab with Beam
		    b) Column.

		Measurement Book – Procedure for entering in measurement book Entering measurement for building works All the students should enter directly on measurement book and they should keep the Entry for the following works independently in the measurement book including Schedule rates for the respective work for the current year. Setting out a small building in the field for a given line plan. **EXERCISE FROM EXISTING BUILDINGS INSIDE THE CAMPUS AND ONLY SINGLE ROOM FOR EACH STUDENT** Measurement and abstract for flooring work Measurement and abstract for Brick work Measurement and abstract for color washing **III. PRE – MEASUREMENT FOR STEEL WORK** The following models should be prepared in the laboratory, students should take out measurement from the model, they should enter the measurement in the measurement book and the total quantity of steel required in kg for each item may be arrived. Distributor - 6 mm dia – 12 nos. 1 One way slab-size - 2.0 m x 3.50 m. Main rod - 8 mm dia – 20 nos. 2. Column footing Footing – size – 1.0 m x 1.0 m – 10 mm dia 5 nos. each direction Column-- size - - 230 x 230 mm– 4 nos. 12mm dia. 3. Beam – size – 230 mm x 300 mm – Length – 2.0 m. Bottom rod – 12 mm – 3 nos. Top rod – 10 mm – 2 nos. Stirrups – 6 mm – 14 nos. III .CONCRETE MIX DESIGN (For demonstration purpose only, but it is compulsory) – I.S Method only.
SURVEY PRACTICAL –	**SURVEY PRACTICAL –**	<u>**Addition:**</u> Nil

II	II	**Deletion:** Run closed theodolite traverse-Measuring length, included angles, and bearing at initial station. Plot the traverse.
IV-TERM **Theory(3):**	**IV-TERM** **Theory(3):**	
Structural Engineering	**Structural Engineering**	**ADDITION:** Behavior of R.C members in bending, – Different types of loads on structures as per IS: 875-1987 - Different methods of design. Actual and Critical neutral axes – Under / Over reinforced sections- Balanced sections – Lever arm, Advantages-Design stress in tension and compression steel. face reinforcement as per IS 456 -2000 - Development Length Anchorage values of bends and hooks - Curtailment of Reinforcements. **2.2 DESIGN OF CONTINUOUS BEAMS FOR FLEXURE AND SHEAR BY L.S.M** Methods of analysis of continuous beams- Effective Span-Arrangement of Loading for Critical Bending Moments- B.M coefficients specified by IS:456-200-Design of rectangular continuous beams (Singly and Doubly Reinforced) using B.M. coefficients (equal spans &u.d.l only) for sagging and hogging moments **DELETION:** NIL
Environmental Engineering. & Pollution Control	**Environmental Engineering**	**Addition:** **CHAPTER:1.1 INTRODUCTION** Water Supply – Salient Features of a Water Supply Scheme –Flow Chart of a Water Supply Scheme- Agencies responsible for protected water supply. **3.2 PREPARATION OF WATER SUPPLY SCHEME OR PROJECT** Reconnaissance of Survey – Demand of Water – Source of Water – Preparation of Topographical Map – Layout Map of the Scheme – Map and Drawing to be Prepared – Office Work – Project Report. A Study of Construction waste and demolition structures

		DELETION: Field procedure for co-ordinate measurement–Field procedure to run a traverse survey- Linking data files for Various Applications. Types Of Pumps -Pipe Corrosion – Corrosion Control. Oxidation Ponds-Sludge-Types-Methods Of Sludge Disposal.
Elective(3): Remote Sensing And GIS	**Elective(3): Remote Sensing and Geo informatics**	**Addition:** Regional Planning and Site investigations, Hydrology and Water Resources Engineering, Transportation network analysis - Highway Alignments. **DELETION: NIL**
Advanced Construction Technology	**Concrete Technology**	**NOTE: In E scheme the Advanced Construction Technology replaced as Concrete Technology in F scheme V Term.**
Water Resource Management	**Geotechnical Engineering**	**NOTE: In E scheme the Water Resource Management was in V Term, now it was moved to VI Term.** **Geotechnical Engineering: NEW SUBJECT**
IV-TERM Practical (4):	**IV -TERM Practical (4):**	**ADDITION:** R.C.C square overhead tank supported by four columns
Civil Engineering Drawing – II	**Civil Engineering Drawing and CAD Practical – II**	Steel Foot over bridge across a highway Continuous one-way slab (with three equal spans) Simply supported two-way slab Restrained two-way slab Singly reinforced rectangular beam Doubly reinforced Continuous beam (Rectangular beam with two spans) Tee Beams supporting continuous slab Lintel and Sunshade Dog-legged staircase **DELETION:** Infiltration gallery (one infiltration well) Bio gas plant with floating type. R.C.C. slab Culvert with splayed wing walls.

		Two span Pipe culvert. Steel Column with Slab base. Steel Beam to Steel Column Connection- Seat angle and Web angle connections. Steel Beam to Steel Beam Connections – Web to Web connections.
Cad In Civil Engineering Drawing II	-----	**The course Cad In Civil Engineering Drawing II in E scheme now combined together as Civil Engineering Drawing and CAD Practical – I in F scheme**.
Environmental Engineering & Plumbing Lab	**Environmental Engineering Laboratory**	<u>**Addition :**</u> Determine the optimum dose of coagulant in a given raw water sample by jar test. Determine the dissolved oxygen in the given sample of water . Determination of suspended solids and dissolved solids present in the given sample of water / waste water. Determination of "Temporary and permanent Hardness" present in the given sample of water by EDTA titration method. Prepare a report of a field visit to water treatment plant. Study of sanitary wares (with actual models displayed on board) Study of air pollution control equipments (Gravity settling chamber, Cyclone filter with models/devices). Prepare a report of a field visit to sewage treatment plant. <u>**Deletion:**</u> Estimation of residual chlorine by colour comparison disc Determination of Turbidity of water by Jackson's candle/Turbidity meter / Digital Turbidity meter Determination of alkalinity by titration method

		Laying and joining of stoneware pipes Laying and joining of rigid PVC pipes
Elective: ------	**Elective(3):** **Advanced Surveying and Basic GIS Practical**	**NOTE:** This practical course Was added a one of the Elective Practical in F-Scheme**.**
------	**Concrete Technology Practical**	**NOTE:** This practical course Was added a one of the Elective Practical in F-Scheme.
------	**Geotechnical Engineering Laboratory**	**NOTE:** This practical course Was added a one of the Elective Practical in F-Scheme.
------	**Entrepreneurship and Startups**	**NOTE:** This practical course Was added a replacement of Life And Employability Skill Practical in F-Scheme .
Life And Employability Skill Practical	------------	**NOTE:** This practical course moved to first year F-Scheme syllabus
IV-TERM **Theory(3):**	**IV-TERM** **Theory(3):**	
Project Engineering Management With MIS	**Construction Management**	**Addition:** BOOT Contract type. **FEASIBILITY STUDY** Study of necessity of project– Technical feasibility, Financial feasibility, Ecological feasibility, Resource feasibility, Recovery from the project, Economical Analysis –Building Economics – Preliminary studies, Analysis – valuation. Objectives of planning – Public Project - Preliminary planning – Design factors – Site utilization- – Reconnaissance survey – Preliminary survey – Analysis and plotting of data – Estimate : preliminary and detailed estimate –Project report – Land acquisition – Administrative approval –Technical sanction – Budget provision- Private project.

		ETHICS IN ENGINEERING Human values - Definition of Ethics - Engineering ethics – Engineering as a profession - Qualities of professional - Professional institutions -Code of ethics - Major ethical issues - Ethical judgment – Engineering and management decision - Value based ethics. **ENTREPRENEURSHIP** Definition – Role and Significance – Risks and Rewards – Concepts of Entrepreneurship – Profile and requirement of entrepreneur - Programmes existing in India – SISI, DIC, TANSIDCO – Funding and technical assistance to Entrepreneurship- NIDCO,ICICI,IDBI,IFCI,SFC. **FINANCIAL MANAGEMENT** Elements of cash flow – Time value of money – Interest rate of capital – Present value computation - NPV method – IRR method – simple problems - Global banking culture - Types of banks –Activities of Banks – Corporate finance – Personal, retail and rural banking – Treasury management-Cost Analysis-Direct Cost –Indirect Cost-total cost. **Deletion:** **HUMAN FACTORS IN CONSTRUCTION:** Traits of efficient construction managers - Team building/Contract implementation /project organization skills - Ethics and integrity **CONSTRUCTION ECONOMICS** Types of taxes - Introduction to – Excise Tax Service Tax , Income Tax, VAT, Custom Duty. Income expenditure statement (basic concept only)- balance sheet .
Estimating And Costing-II	**Estimation, Costing and Valuation**	**NOTE: This subject is a combination of Estimating And Costing-I &** **Estimating And Costing-II of E scheme** **Addition: Nil** **DELETION:**

		DELETION: **TAKING OFF QUANTITIES OF P.H.ENGINEERING STRUCTURES USING TRADE SYSTEM** 1.Open well with masonry steining 2. Square RCC over head tank on four columns with staging. **TAKING OFF QUANTITIES OF ROAD/BRIDGE STRUCTURES USING TRADE SYSTEM** 1.Cement concrete road with side drains 2.T beam bridge 3.Pipe culvert
Elective(3): **Repair &Rehabilitation Structure**	**Elective(3):** **Sustainable and Green Building Technology**	**NOTE:** This theory course Was added a one of the Elective theory in F-Scheme**.**
Steel Structures	**Urban Planning and Development**	**NOTE:** This theory course Was added a one of the Elective theory in F-Scheme**.**
Earth Quake Engineering	**Water Resources Engineering**	**NOTE:** This theory course Was added a one of the Elective theory in F-Scheme in E scheme Water Resources Engineering one of the Elective in V term.
IV-TERM **Practical (3):**	**IV-TERM** **Practical (3):**	
Structural Design & Drawing.	----------	**Note :Structural Design & Drawing subject was removed from F-Scheme Syllabus. but the following Structural Design & Drawing topics were added in Civil Engineering Drawing and CAD Practical – II** Continuous one-way slab (with three equal spans) Simply supported two-way slab

		Restrained two-way slab Singly reinforced rectangular beam Doubly reinforced Continuous beam (Rectangular beam with two spans) Tee Beams supporting continuous slab Lintel and Sunshade Dog-legged staircase R.C.C. Column with square isolated footings
Computer Applications. In Civil Engineering	**Computer Applications. In Civil Engineering**	**Addition:** Design and Analysis problems Calculate Area and Elongation using Formula bar Calculate Effective depth„d" and Area of Steel „Ast "using Formula Bar for given dimension of Masonry/R.C.C Dam ie. top width, bottom width, height of Dam , height of water, Specific weight of masonry/R.C.C. , Sp.wt of Water etc,. Find the base pressure and check the stability of the dam .Finding centre of gravity; IZZ and IYY of I, L,T and channel sections Preparation of Bar Bending schedule for a Dog-legged staircase STAAD. Pro Software. Prepare the analysis of RCC structures using STAAD. Pro Software. Prepare the design of RCC structures using STAAD. Pro Software. Develop the CPM / PERT Network for the proposed simple building project using any one of the available packages mentioned below or any other suitable packages. Develop Aerial map of given area using any one of the available packages mentionedbelow or any other suitable packages. **Deletion:** Preparation of approval drawing to be submitted to -Corporation or Municipality showing required details One sheet such as

		Site Plan (Land Boundary, Building boundary, Car parking, Passage, Sanitary layout, Septic Tank location etc.) G.F. Plan, F.F. Plan, Section and Elevation (line diagram is enough) Key Plan Septic Tank Plan and Section (line diagram) Develop the drawing using CAD Packages and prepare detailed estimate for the Following works:1) School building. 02) A residential building with two bed rooms with RCC flat roof.03) Septic tank with Dispersion Trench 04)) R.C.C slab culvert Study of INTERNET - Using World Wide Web – Browsing famous Civil Engg. Sites. Creating an E-mail ID, sending E-mails with attachments.
Construction Practice Lab	----------	**NOTE:** This practical course Was added in IV term.
Elective(3): -----	**Elective(3): Estimation and Costing Laboratory**	**NOTE:** This Practical course Was added a one of the Elective theory in F-Scheme**.**
-----	**Highway Engineering Laboratory**	**NOTE:** This Practical course Was added a one of the Elective theory in F-Scheme**.**
-----	**Water Resources Engineering Laboratory**	**NOTE:** This Practical course Was added a one of the Elective theory in F-Scheme**.**
Project Work With Entrepreneurship & Disaster Management	**Project Work and Internship**	**Addition:** • **COMPARATIVE STUDY** • **ADMIXTURES** • **STUDY OF SPECIAL TYPES OF CONCRETE IN CONSTRUCTION BYEXPERIMENTS**

8. HORIZONTAL AND VERTICAL ORGANISATION OF THE SUBJECTS

Sl. No	Course Code	Subject	Term	Foundation	Core	Applied	Diversified	Value added course
CORE								
1	1F3201	Mechanics of Solids	III		6			
2	1F3202	Construction Materials & Construction Practice	III		5			
3	1F3203	Surveying	III		6			
4	1F3204	Building Planning and Drawing	III		2			
5	1F3205	Material Testing Laboratory– I	III		2			
6	1F3206	Surveying Practice –I	III		2			
7	1F4207	Hydraulics	IV		6			
8	1F4208	Hydraulics Laboratory	IV		2			
9	1F6209	Estimation, Costing and Valuation	VI		6			
					37			
APPLIED								
10	1F4301	Theory of Structures	IV			6		
11	1F4302	Transportation Engineering	IV			5		
12	1F4303	Material Testing Laboratory–II	IV			2		
13	1F4304	Construction Practice Laboratory	IV			2		
14	1F4305	Surveying Practice –II	IV			2		
15	1F5306	Structural Engineering	V			6		

16	1F5307	Environmental Engineering	V			5		
17	1F5308.1	Remote Sensing and Geo informatics	V			5		
18	1F5308.2	Concrete Technology						
19	1F5308.3	Geotechnical Engineering						
20	1F5309	Environmental Engineering Laboratory	V			2		
21	1F5310.1	Advanced Surveying and Basic GIS Practical	V			2		
22	1F5310.2	Concrete Technology Practical						
23	1F5310.3	Geotechnical Engineering Laboratory						
24	1F6311	Construction Management	VI			6		
25	1F6312.1	Sustainable and Green Building Technology	VI			5		
26	1F6312.2	Urban Planning and Development						
27	1F6312.3	Water Resources Engineering						
28	1F6313.1	Estimation and Costing Laboratory	VI			2		
29	1F6313.2	Highway Engineering Laboratory						
30	1F6313.3	Water Resources Engineering Laboratory						
						50		
DIVERSIFIED								
31	1F3401	Civil Engineering Drawing and CAD Practical – I	III				2	
32	1F5402	Civil Engineering Drawing and CAD Practical – II	V				3	
33	1F6403	Computer Applications in Civil Engineering Practice	VI				3	

34	1F6404	Project Work and Internship	VI				3	
							11	
VALUE ADDED COURSE								
35	1F0006	Universal Human Values	IV					5
36	1F5501	Entrepreneurship and Startups	V					2
37	1F0007	Concurrent career development	V					5
38	Co-curricular activities	Physical Education						-
39		Library						-
Total credits					**37**	**50**	**11**	**12**
Total Credits = Frist year 60 credits + programme 110 credits								**170**

DETAILED SYLLABUS

III TERM

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name   :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F 3201
Term   :   III
Course Name   :   MECHANICS OF SOLIDS

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
MECHANICS OF SOLIDS	6	96	25	100*	100	3 Hrs.

Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Simple Stresses and Strains	22
II	Shear Force and Bending Moment	17
III	Geometrical Properties of Sections	17
IV	Stresses in Beams and Shafts	17
V	Pin Jointed Frames	16
	Test & Model Exam	7
	Total	**96**

RATIONALE:

During design of any structural member, the analysis of structure is very important. The application of loads and its effect on the member is also equally important. The knowledge of physical property and its structural behavior is very essential. So these things are included in Strength of materials.

OBJECTIVES:

At the end of this course, students will be able to

- Define Mechanical Properties of materials and different type of stress and strain.
- Understand the applications of stress and strain in engineering field.
- Analyze determinate beams and sketch S.F. and B.M. diagram.
- Locate the position of centroid of different geometrical section and Built up section and determine Ixx, Iyy, Zxx, Zyy of different geometrical section & built up sections.
- Derive simple bending eqn. and understand its applications.
- Derive Torsional equation and understand its applications.
- Analyze Pin Jointed Frames analytically and graphically.
- Solve simple problems in the course of study.

Course Outcome:

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F3201-CO1	Ability to examine the structural members subjected to tension, compression, torsion, bending and combined stress using the fundamental concepts of stress, strain and elastic behavior of materials	**A-3**
1F3201-CO2	Ability to analyze the structural beams for shear force and bending moment.	**A-4**
1F3201-CO3	Ability to devise the geometrical properties of sections and moment of inertia.	**C-6**
1F3201-CO4	Ability to deduce the stresses in beams and shafts.	**A-4**
1F3201-CO5	Ability to analyze the pin jointed frames graphically and statically.	**A-4**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hrs
I	**SIMPLE STRESSES AND STRAINS** **CHAPTER:1.1 INTRODUCTION TO STRESSES AND STRAINS** Definitions of: Force, Moment of force, Actions and reactions, Statics, Static equilibrium of bodies, Mechanics, Engineering Mechanics - Conditions of static equilibrium - Types of forces on structural members - Study of strength of material - Mechanical properties of materials – Rigidity, Elasticity, Plasticity, Compressibility, Hardness, Toughness, Stiffness, Brittleness, Ductility, Malleability, Creep, Fatigue, Tenacity, Durability - Definitions of stress and strain - Types of stresses - Tensile, Compressive and Shear stresses - Types of strains - Tensile, Compressive and Shear strains - Elongation and Contraction - Longitudinal and Lateral strains - Poisson"s Ratio - Volumetric strain - Simple problems in computation of stress, strain, Poisson"s ratio, change in dimensions and volume etc- Hooke"s law - Elastic Constants - Definitions of: Young's Modulus of Elasticity – Shear modulus (or) Modulus of Rigidity - Bulk Modulus - Relationship between elastic constants (Derivations not necessary)- Simple problems .	11
	CHAPTER:1.2 APPLICATION OF STRESS AND STRAIN IN ENGINEERING FIELD Behaviour of ductile and brittle materials under direct loads - Load Extension curve (or) Stress Strain curve of a ductile material - Limit of proportionality, Elastic limit, Yield stress, Ultimate stress, Breaking stress, Actual / Nominal stresses - Working stress Factor of safety - Percentage elongation - Percentage reduction in area - Significance of percentage elongation and reduction in area of cross section - Deformation of prismatic and stepped bars due to uniaxial load - Deformation of prismatic bars due to its self weight - Numerical problems. Composite Sections – Examples of composite sections in Engineering field- Advantages - Assumptions made – Principles of analysis of Composite sections - Modular ratio - Equivalent area (No problems).	11
II	**SHEAR FORCE AND BENDING MOMENT** **CHAPTER:2.1 TYPES OF LOADS AND BEAMS** Definitions of: Axial load, Transverse load, Concentrated (or) Point load, Uniformly Distributed load (UDL), Varying load – Types of Supports and Reactions: Simple support, Roller support, Hinged support, Fixed support; Vertical reaction, Horizontal reaction, Moment reaction- Types of Beams based on support conditions- Diagrammatic representation of beams, loads and supports– Static equilibrium equations – Determinate and indeterminate beams.	8
	CHAPTER:2.2 SHEAR FORCE AND BENDING MOMENT IN BEAMS Definitions of Shear Force and Bending Moment – Conventional signs used for S.F. and B.M – S.F and B.M of general cases of determinate beams – S.F and	

	B.M diagrams for Cantilevers, Simply supported beams– Position of maximum BM - Derivation of Relation between intensity of load , S.F and B.M. – Numerical problems on S.F and B.M. (Determinate beams with concentrated loads udl and couple)	9
III	**GEOMETRICAL PROPERTIES OF SECTIONS** **CHAPTER:3.1 CENTROID** Geometrical properties – Definitions and examples of Symmetrical, Anti Symmetrical, Asymmetrical shapes - Definitions of centre of gravity and centroid - Centroid of Symmetrical shapes (solid / hollow square, rectangular, circular, I Sections) - Centroid of Asymmetrical shapes (triangular, semi circular, quadrant, trapezoidal, parabolic sections) - Centroid of Anti Symmetric shapes (S, Z sections)– Built up structural sections – Problems	8
	CHAPTER:3.2 MOMENT OF INERTIA Definitions of: Inertia, Moment of Inertia, Polar moment of inertia, Radius of gyration, Section Modulus, Polar modulus - Parallel and perpendicular axes theorems - Derivation of expressions for M.I / Polar M I, Section modulus and Radius of gyration of regular geometrical plane sections (rectangle and circle only) – M.I about centroidal axis / base, Section modulus, Radius of gyration of symmetric, asymmetric, anti symmetric and built up symmetrical sections – Numerical problems.	9
	STRESSES IN BEAMS AND SHAFTS **CHAPTER:4.1 STRESSES IN BEAMS DUE TO BENDING** Types of Bending stresses – Neutral axis – Theory of simple bending – Assumptions – Moment of resistance – Derivation of flexure/bending equation $M / I = E / R = \sigma/y$ – Bending stress distribution – Curvature of beam – Position of N.A and centroidal axis – Stiffness equation – Flexural rigidity – Strength equation – Significance of Section modulus – Numerical problems.	8
	CHAPTER:4.2 STRESS IN SHAFTS DUE TO TORSION Definitions of: Shaft, Couple, Torque (or) Twisting moment - Types of Shafts (one end fixed and the other rotating, both ends rotating at different speeds) - Theory of Pure Torsion – Assumptions -Derivation of Torsion equation, $T / Ip = \lambda max/ R = G\theta / I$ - Shear stress distribution in circular section due to torsion - Strength and Stiffness of shafts – Torsional rigidity - Torsional modulus - Power transmitted by a shaft - Numerical problems.	9
V	**PIN JOINTED FRAMES** **CHAPTER:5.1 ANALYSIS BY ANALYTICAL METHOD (METHOD OF JOINTS)** Definitions of: Frame / Truss, Pin Joint, Nodes, Rafters, Ties, Struts, Slings- Determinate and indeterminate frames – Classification of frames - Perfect and imperfect frames – Deficient / Instable and redundant frames - Formulation of a perfect frame - Common types of trusses -	10

Support conditions - Resolution of a force - Designation of a force - Nature of forces in the frame members - Analysis of Symmetrical Frames – Assumptions - Methods of analysis - Analytical methods - Method of Joints and Method of Sections - Problems on Analysis of   cantilever and simply supported perfect frames (with not more than ten members) with vertical nodal loads by method of joints only. Identification of members with nil force in a determinate truss.

5.2   ANALYSIS BY GRAPHICAL METHOD

Graphic statics - Advantages - Space diagram - Bow's notation- Resultant force (Equivalent force -Equilibrant force - Vector diagram - Determination of magnitude and nature of forces in the members of a cantilever / simply supported determinat trusses (withnot more than eight members) with vertical nodal loads only.

6

Text Books:

Sl.No.	Title	Author	Publisher
1.	Strength of Materials- 2006	R.S. Khurmi & N. Khurmi	S. Chand & company Ltd.

Reference Book:

Sl.No.	Title	Author	Publisher
1.	Engineering Mechanics-2014	Dr.N.Kottiswaran	Sri Balaji publications.
2.	Engineering Mechanics-2010	Bansal .R.K	Laxmi Publications, New Delhi.
3.	Engineering Mechanics-4th edition	S.S. Bhavikatti	Vikas Publications Private Ltd.
4.	Strength of materials (2011)	B.C.Punmia	Laxmi Publications, New Delhi.

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F3202
Term : III
Course Name **:** CONSTRUCTION MATERIALS AND CONSTRUCTION
PRACTICE

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
CONSTRUCTION MATERIALS AND CONSTRUCTION PRACTICE	6	96	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Building Materials	15
II	Building Materials (Contd.)	15
III	Foundations And Masonries	15
IV	Doors, Floors, Roofs, etc.,	14
V	Pointing, Plastering, Painting, Form Work, etc.,	14
	Test & Model Exam	7
	Total	**80**

RATIONALE:

Civil Engineering diploma holders have to supervise construction of various types of civil works involving, the use of various materials like stones, bricks and tiles, cement and cement based products, lime, timber and wood based products, paints and varnishes, metals and other miscellaneous materials. The students should have requisite knowledge regarding the characteristics, uses and availability of various building materials and skills in conducting tests to determine the suitability of materials for various construction purposes. In addition, specifications of various materials should also be known (PWD/BIS) for effective quality control

To perform the above tasks, it is essential that students should have knowledge of various sub components of buildings like foundations, walls, roofs, stair cases, floors etc., and their constructional details. Therefore, the subject of Construction Materials and Construction Practice is very important for Civil Engineering diploma holders.

OBJECTIVES:

On completion of the course, the students will be able to:

- State different construction materials and their properties.
  Explain the different types of cement, grades of cements and tests on cement.
- State and explain the different types of modern building materials such as ceramicproducts, glass, metals and plastics.
- Explain the method of preparation of mortar, cement concrete and state the differenttypes of structures.
- Describe the different types of foundations.
- Describe the classification of stone masonry & brick masonry. State the differenttypes of doors, windows, lintels & stairs.
- Describe the types of floors and roofs.
- Describe the different methods of pointing, plastering and termite proofing.
- Explain the methods of scaffolding, shoring & underpinning and form work Describe procedure of colour washing, white washing, painting and varnishing.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F3202 –CO1	Ability to summarize the properties and uses of stones, rocks, bricks, lime, cement, water, glass and ceramics.	**A-5**
1F3202 –CO2	Ability to classify the types, properties and uses of mortar, concrete, paints, metals, plastics, timber, roof	**U-2**

	coverings ,damp proofing materials and geo synthetics.	
1F3202-CO3	Ability to describe different types, methods of construction and uses of foundations, brick and stone masonry, partitions, Water proofing and damp proofing.	**A-2**
1F3202 –CO4	Ability to Explain different types, methods of construction and uses of doors, windows, ventilator, Hollow block construction, stairs, floors, flooring, roof and weathering course.	**U-2**
1F3202-CO5	Ability to discuss the methods of pointing, plastering, scaffolding, shoring and underpinning, painting, colour washing, Anti termite treatment and form work.	**A-6**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**CHAPTER : 1.1 INTRODUCTION** Physical properties of materials - Density, Bulk density, Specific gravity, porosity, water absorption, permeability, chemical resistance, fire resistance, weathering resistance, thermal Conductivity, Durability. (Definitions only).	**2**
	CHAPTER : 1.2 ROCKS AND STONES Rocks -Classification of Rocks - Geological, Physical and Chemical classification - Uses of stones - Requirements of a good building stone - Natural and Artificial stones for flooring - Examples (Detailed description not required).	**2**
	CHAPTER : 1.3 BRICKS Definition - Brick earth - Composition of good brick earth - Manufacturing process- classification of bricks - properties of bricks - special types of bricks and their uses – compressive strength of bricks - Tests on bricks(Names only) - grades and Corresponding requirements of bricks as per BIS.	**2**
	CHAPTER : 1.4 LIME AND POZZOLANAS Sources of lime - classification lime - Fat, Hydraulic and Poor lime - uses of lime - Pozzolanic materials - Surki, Flyash, Ground blast furnace slag, Rice husk ash - Advantages of adding pozzolanas to cement.	**2**

	CHAPTER : 1.5 CEMENT Definition - Composition of ordinary Portland cement - Functions of Cement ingredients - Different types of cements - Grades of cement (33,43 and 53) - Storage of cement - Tests on cement (Names only) - objects of each test - Test requirements/ BIS specifications of OPC– Admixtures - Definition, types and uses.		**3**
	CHAPTER : 1.6 WATER General requirement of water used in construction works - Use of sea water in construction works- Permissible limits of deleterious materials in construction water as per BIS- Effects of Sulphates and Chlorides in ground water - Minimum pH value.		**2**
	CHAPTER : 1.7 GLASS Definition - Constituents of glass- Classification of glass - Functions and Utility - Types of glass, sizes and thickness used in Buildings.		**2**
II	**CHAPTER : 2.1 MORTAR** Definition - Properties and uses of mortar- Types of mortar - Cement and Lime mortar - Mix ratio of cement mortars for different Works.		**1**
	CHAPTER : 2.2 CONCRETE Definition - Constituents of concrete and their requirements - uses of concrete - Types of concrete: Lime concrete, cement concrete and light weight concrete – Definitions only.		**1**
	CHAPTER :2.3 PAINTS AND VARNISHES Definition - Functions of paint Types of paints and their uses - Oil, Enamel, Emulsion, Distemper, Cement, Aluminium, Bituminous and Plastic paints -Varnishes, Definition- Characteristics of a good varnish –Types of varnish and their uses Oil, Turpentine, Spirit and water varnish.		**2**
	CHAPTER : 2.4 METALS AND PLASTICS Types of metals used in construction - Cast Iron, Steel, Aluminium, GI, Stainless steel- Market forms of steel Steel for reinforced concrete - steel for pre stressed concrete - Plastics Characteristics and Uses of plastics -Types - Thermoplastics and Thermosetting plastics - Various plastic products: pipes, taps, tubs, basins, doors, windows, water tanks, partitions sizes, capacity and uses-Advantages and disadvantages of plastic products- Asbestos – uses of asbestos.		**3**
	CHAPTER : 2.5 TIMBER AND TIMBER PRODUCTS Types of Timber -Teak, Sal, Rosewood, Mango, and Jack –		**2**

	Defects in timber seasoning of timber- objectives - Timber Products - Veneers, Ply woods, Particle Board, Fibre board, Hard board, Blockboard, Laminated board Uses.	
	CHAPTER : 2.6 ROOF COVERINGS	**2**
	Definition - objectives and uses - AC Sheets FRB Sheets - G.I. sheets- Steel sheets- Polycarbonate sheets- Shell roof – R.C.C roof Advantages - Types.	
	CHAPTER : 2.7 DAMP PROOFING MATERIALS:	**2**
	Materials used for damp proofing – Properties and functions of various types of water proofing materials commonly available – chemicals used for grouting / Coating porous concrete surfaces – Admixtures for cement mortar and cement concrete – Functions of Admixtures – Accelerators, Retarders, Air repelling chemicals.	**2**
	CHAPTER : 2.8 CLAY AND CEMENT CONCRETE BLOCKS	
	Porotherm blocks, CSE (Compressed stabilized earth blocks-IS2222/1991 AAC Blocks, Solid blocks, paver blocks, testing of blocks(IS2185/1979,PART-1)	
III	**CHAPTER : 3.1 INTRODUCTION TO STRUCTURES**	**2**
	Permanent and temporary structures - Life of structures - Sub structure -super structure - load bearing structure - framed structure - concept of framed structure - advantages of framed structure.	
	CHAPTER : 3.2 FOUNDATION	
	Definition - objectives of foundation - Bearing capacity of soil – Definition -maximum/ultimate and safe bearing capacity - Bearing capacity of different types of soils - Requirements of a good foundation - Types of foundations - Shallow foundation: Spread foundation, Isolated column footing, combined footing, continuous footing, Raft foundation – Deep Foundation: Pile, Stone columns Types of piles : Bearing pile, Friction pile, under reamed pile - Causes of failure of foundation - Remedial measures.	**3**
	CHAPTER : 3.3 STONE MASONRY	
	Definition - Common terms used : Natural bed, sill, corbel, course, cornice, coping, weathering, throat, spalls, quoins, string course, lacing course, through stone, plinth, jambs Classification of stonemasonry - Rubble masonry : Coursed, un coursed &Random rubble masonry - Ashlar masonry - points to be considered in the Construction of stone masonry - Tools used (Names only).	**2**
	CHAPTER : 3.4 BRICK MASONRY	
	Definition - Common terms used - Header, stretcher, bed joint,	

	lap, perpend, closer, king, queen & beveled, bat permissible loads in brick masonry - Bond - Types Header, stretcher, English bond & Flemish bond one brick thick and one and a half brick thick - „T" junction in English bond - Points to be considered in the construction of brick masonry - Cavity bond masonry - Defects in brick masonry -Maintenance of brick masonry - Reinforced brick masonry - purpose - Its Advantage with respect to strength and Earthquake resistance.	**3**
		2
	CHAPTER : 3.5 PARTITION	
	Definition - Requirements of good partition wall - Types Brick, Concrete, glass, Aluminum frame with Glass sheet, timber, straw board, wood wool, Asbestos Cement board and plastic board partitions	**3**
	CHAPTER :3.6 WATER PROOFING AND DAMP PROOFING	
	Dampness - Causes of dampness - Effects of dampness - Damp proofing - Damp proof courses (DPC) - Method of mixing - Bad effects of excessive Admixtures in RCC - Water proofing coats for sump / overhead tank wall - Methods of grouting.	
IV	**CHAPTER : 4.1 DOORS, WINDOWS AND VENTILATORS**	
	Standard sizes of doors and windows - Location of doors and windows - Different materials used - Doors Component parts Types - Framed and panelled, glazed, flush, louvered, and collapsible, rolling shutter and sliding doors - Windows Types - Casement, Glazed, Bay, Corner, Pivoted, Circular and Dormer windows- Ventilators – Definition, purpose, Types - Ventilator combined with windows / doors.	**3**
	CHAPTER : 4.2 HOLLOW BLOCK CONSTRUCTIONS	
	Hollow blocks - Advantages of hollow blocks - load bearing and non load bearing hollow blocks - Open cavity blocks – face shells, web, gross area, nominal dimensions of blocks, minimum thickness of face shells and web, grades of hollow concrete blocks - Materials used, admixtures added - mixing, moulding, placing and compacting, curing, drying.	**2**
	CHAPTER : 4.3 STAIRS	
	Definition - Terms used - Location of stair types - Straight, Dog legged, Open well, bifurcated and spiral stairs - Moving stairs (Escalators) - Lift components uses and advantage of lifts over stairs.	**2**
	CHAPTER : 4.4 FLOORS AND FLOORING	
	Floors - Definition - Types - Timber, Composite, RCC floors - Flooring - Definition- Materials used - Selection of flooring types -	**3**

		Construction Methods (As per C.P.W.D/P.W.D Specifications) - Mosaic, Granolithic, Tiled, Granite, Marble, Pre cast concrete flooring, Plastic & PVC tile flooring- Carpet tile & Rubber flooring.	
		CHAPTER : 4.5 ROOFS	**2**
		Definition - Types of roof - Flat roof - RCC roof - Pitched roof- Tile roof - Shell roof - Technical terms - Steel roof truss Types: King post, Raised chord, Howe truss, Fan, fink, north light and Modified north light trusses.	
		CHAPTER : 4.6 WEATHERING COURSE	**2**
		Weathering course – Purpose - Materials Required - Brick Jelly Concrete preparation - Laying procedure- Preparation of mortar with Damp Proof materials for laying pressed clay tiles- Pointing and Finishing of clay tiles - Use of Thermal Resistant - Weathering Tiles.	
V		**CHAPTER : 5.1 POINTING**	**2**
		Objectives - Mortar for pointing - Methods of pointing (As per C.P.W.D. / P.W.D Specifications) - Types of pointing - Flush, recessed, weathered, keyed or grooved pointing.	
		CHAPTER : 5.2 PLASTERING	**3**
		Definitions - Objectives - Cement mortars for Plastering - Requirements of a good plaster - Methods of Plastering - Defects in plastering - Stucco plastering - Acoustic plastering - Granites silicon – plastering – Sand faced Pebble dash - Wall paper finishing- Wall tiling.	
		CHAPTER:5.3 WHITE WASHING, COLOUR WASHING , DISTEMPERING,PAINTING & VARNISHING	**3**
		White washing - preparation of surface - Application of white wash - Colour washing - Distempering - Preparation of surfaces - Application of distemper- Painting & Varnishing - Preparation of Surface - Application of Painting & Varnishing.	
		CHAPTER : 5.4 ANTI-TERMITE TREATMENT	**1**
		Definition - objectives and uses - Methods of termite treatment.	
		CHAPTER : 5.5 SCAFFOLDING, SHORING AND UNDER PINNING	**3**
		Scaffolding – Definition - Component parts - Types Single, double& Steel scaffolding, Shoring – Definition - Types Raking, flying and dead shores - Underpinning definition - Purpose - Types - Pit Methods - Pile Method.	
		CHAPTER : 5.6 FORM WORK	**2**
		Definition - Materials used - Requirements of a good form work - Form work for column, RC beams and RC slab.	
		Test & Model Exam	7hrs

Reference Books

Sl.No.	Title	Author	Publisher
1.	Building construction – 2016	B.C.Punmia,	Laxmipublications(p)Ltd,New Delhi
2.	Building Materials - 2012	S.K.Duggal	New age publication.
3.	Building Material and construction – 2014	S.S.Bhavikatti	Vikas publishing house.
4.	Building Materials - 2015	P.C.Varghese,	Prentice hall of India, New Delhi.
5.	Materials of construction-2001	D.Ghose,	TataMcGraw-HillPublishers,NewDelhi

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F3203
Term : III
Course Name : SURVEYING

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				Duration
	Hours / Week	Hours / Semester	Marks				
			Internal Assessment	Board Examinations	Total		
Surveying	6	96	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Introduction to Surveying and Chain Surveying and compass Surveying	22
II	Levelling	17
III	Theodolite Surveying, hydrographic surveying & sounding	17
IV	Tacheometric Surveying & Contour Surveying	17
V	Total Station and Global Positioning system	16
	Test & Model Exam	7
	Total	**96**

RATIONALE:

The important functions of a diploma civil engineer include the jobs of detailed surveying, plotting of survey data, preparation of survey maps and setting out works. While framing thecurriculum for the subject of surveying, stress has been given to the development of the skill in each type of survey like chain surveying, compass surveying and levelling that the Civil Engineering diploma holder will normally be called upon to perform. Each type of Survey like Chain surveying, Compass surveying, Levelling, Theodolite surveying, Tachometric surveying, Contour surveying, Total station surveying and GPS introduced in this course.

OBJECTIVES:

On completion of the course, the students will posses knowledge about:

- Chain surveying
- Compass surveying
- Theodolite surveying
- Tacheometric Surveying
- Preparation of Contour layouts
- Total Station Surveying
- Global Positioning System

Course Outcome:

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F3203-CO1	Ability to assess the errors chain surveying and compass surveying.	**E-5**
1F3203-CO2	Ability to determine the Reduce level of the ground by leveling instruments.	**A-3**
1F3203-CO3	Ability to deduce angles by theodolite surveying.	**E-5**
1F3203-CO4	Ability to analyze distance, elevation and errors in tachometric surveying and contour surveying.	**A-4**
1F3203-CO5	Ability to summarize the components, features, Field procedure of total station and GPS.	**U-2**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**INTRODUCTION TO SURVEYING AND CHAIN SURVEYING AND CAMPASS SURVEYING** **CHAPTER :1.1 SURVEYING** Definition-Objectives and uses of surveying -Classification of Surveying - Principles of surveying.	**2**
	CHAPTER :1.2 CHAIN SURVEYING Introduction-Instruments used for chaining- Chains and Tapes—Types -Definitions of terms commonly used chain surveying: Survey stations, base line, check line and tie line - Ranging: Direct and Indirect ranging Offsets: Definition, types, Instruments used.	**10**
	CHAPTER :1.3 COMPASS SURVEYING Angular measurements-Necessity Instruments used Prismatic compass-Construction details, functions and Temporary adjustment - Types of meridians - Types of bearings - Whole circle and Reduced bearings ,Fore and Back bearings - Computation of included angles from bearings -Computation of bearings from included angles - Problems.	**10**
II	**CHAPTER :2.1 LEVELLING** Levelling - Definition - Level Parts, Functions, Accessories- Types of levels **:** Dumpy level, Quick setting level, Automatic and Laser level Levelling staff **-** Types Component parts of Levelling instrument - Definitions of terms used **:** Level surface, Horizontal and Vertical surfaces, Datum, Bench marks, Reduced level, Rise, Fall, Line of collimation, Axis of telescope, Axis of bubble tube, Station, Back sight, Fore sight, Intermediate sight, Change point, Height of instrument, Focusing and Parallax - Temporary adjustment of a level - Balancing - Back sight and Foresight- Principle of levelling - Simple levelling -Levelling field book - Reduction of levels - Height of collimation and Rise and Fall method - Comparison of methods - Problems on reduction of levels - Missing entry calculations **:** Problems.	**17**
III	**CHAPTER :3.1 THEODOLITE SURVEYING** Introduction - Types of Theodolites: Transit and non- transit Theodolite, Vernier and Micrometer Theodolites, Electronic Theodolite (Principles and description only) - Component parts of a transit Theodolite - Functions - Technical terms used in Theodolite surveying - Temporary adjustments- Measurement of horizontal	**12**

	angle by method of repetition and reiteration- Measurement of vertical angle and deflection angle- Problems	
	CHAPTER :3.2 HYDROGRAPHIC SURVEYING , SOUNDING Hydrographic surveying – Definition- Uses – Sounding: Definition, Purpose, Instruments needed–Steps in hydrographic surveying	5
IV	**Chapter: 4.1: TACHEOMETRIC SURVEYING** Introduction-Instruments used in tacheometry -Systems of tacheometry: Stadia and Tangential tacheometry - Principles - Fixed hair method of tacheometry - Distance and Elevation formulae - Anallactic lens (No proof) - Advantages and uses - Simple problems.	9
	Chapter: 4.2: CONTOUR SURVEYING Definition - Contour - Contouring - Characteristics of contours - Methods of contouring - Direct and Indirect methods - Methods of contouring - Direct and Indirect methods - gradient - Uses of contour plan and map.	8
V	**TOTAL STATION AND GLOBAL POSITIONING SYSTEM** **Chapter: 5.1: TOTAL STATION** Introduction - Application of total station - Component parts of a Total Station - Accessories used - Summary of total station characteristics - Features of total station - Electronic display and data reading - Instrument preparation, Setting and Measurement (Distance, Angle, Bearing etc.).	8
	Chapter: 5.2: GLOBAL POSITIONING SYSTEM (GPS) Introduction - Maps- Types of Maps - Various Satellites used by GPS - Differential GPS - Fundamentals of GPS - Application of GPS - GPS Receivers - Hand held GPS Receiver - Function Field procedure - Observation and processing applications in Civil Engineering.	8
	Test & Model Exam	**7hrs**

Text Books:

Sl.No.	Title	Author	Publisher
1	Surveying and Levelling (1994)	Basak .N.N,	TataMcGrawHill Publishing co. Ltd. –New Delhi

Reference Book:

Sl.No.	Title	Author	Publisher
1.	Surveying and Levelling (23rd Edition,(2008)	Kanetkar.T.P	Puna Vidhyathri Grigha prakashan
2.	Surveying (VOL.I&II) .(2004)	Duggal,	Tata Mc Graw Hill Publishing co.ltd
3.	Surveying (VOL.I&II). 15th Edition (2011)	B.C Punmia .	Laxmi Publications Private Limited
4.	Advanced Surveying (2007).	Sthish Gopi Or sathikumar	N.Mathu,Pearson Education Chennai

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F 3204
Term : III

Course Name : BUILDING PLANNING AND DRAWING
TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
BUILDING PLANNING AND DRAWING	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Introduction	5
II	Planning of Building	5
III	Basic Drawings	9
IV	Building Drawings	38
	Test & Model Exam	7
	Total	**64**

RATIONALE:

Drawing is the language of engineers. Engineering is absolutely incomplete without a thorough knowledge of drawing. A Civil Engineering diploma holder must be capable of sketching detailed constructional drawing of various components of building for the purpose of communication with the craftsman. Planning of small buildings, developing a line plan, dimensioning, key plan, and drainage plan should be a part of curriculum. The diploma engineer must be conversant with reading and interpretation of drawing for execution of work.

OBJECTIVES:

On completion of the course, the students will be able to:

- Study Conventions and Abbreviations;
- Prepare layout of buildings;
- Gain thorough knowledge of the rules, regulations and standards of buildings;
- Read the line sketch and prepare plan, elevations of buildings and gain thoroughknowledge of planning various types of buildings**.**

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F3204-CO1	Ability to explain Fully panelled double leaf door, Fully Panelled single leaf door, Flush door and Fully Panelled window with grill	**U-2**
1F3204-CO2	Ability to create Drawing Knowledge of various types of buildings using manual drafting.	**C-6**
1F3204-CO3	Ability to draw A residential building with two bed rooms with R.C.C. flat roof ,	**A-3**
1F3204-CO4	Ability to draw A Two roomed house with RCC slope roof with gable ends	**A-3**
1F3204-CO5	Ability to draw another type of building drawing like commercial, institutional building.	**A-3**

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

DETAILED SYLLABUS

Contents: Practical

LIST OF EXPERIMENTS

EXERCISES   **57 Hrs.**

Unit	Name of the Topics	Hours
I	**INTRODUCTION** **CONVENTIONS, SYMBOLS:** General – Conventions- Title block- Scales- Line work- Lettering-Symbols- Abbreviations **BUILDING BYE-LAWS AND SUBMISSION OF DRAWINGS** Objects of bye-laws- Importance of bye-laws- Function of local authority-Setbacks-	5

	Plot Coverage- Number of floors- Height of building- Built upArea- Floor space index (FSI) - Views and details necessary for thepreparation of a civil engineering drawing- Site Plan — Necessity forApproval of plans from local body- Layout plan and key plan-Requirements for submission of drawing for approval- Rules and bye-laws of sanctioning authorities for construction work.	
II	**PLANNING OF BUILDINGS** **PLANNING OF RESIDENTIAL BUILDINGS** Types of residential buildings- Usual requirements-Types of Rooms — Minimum Size requirement for each type of rooms - Furniture arrangement in each room- Position of stairs / lifts- Position of Doors/ Windows House drainage and Sanitary fittings — Sump/Water tanks- Plumbing Pipes -Preparation of line drawing for given requirements with dimensions, not to scale. **PLANNING OF INDUSTRIAL STRUCTURES** Planning aspects - Requirements of industrial units - Sheets for pitched roof coverings — Rolling Shutters - Ramps- Stores- Public Toilets/ Bath rooms- Dining / Resting halls- Ventilation and Lighting - Preparation of line drawing for given requirement with measurements (not to scale). **PLANNING OF PUBLIC BUILDINGS** Types of public buildings - Miscellaneous public buildings - General requirements of Public Buildings -Landscape architecture-Preparation of line plan with dimensions for the given requirements (not to scale). **PERSPECTIVE DRAWING (NOT FOR EXAM)** Definition, Types of Perspective, terms used in perspective drawing, Perspective drawing Two Point Perspective of small objects only such as steps, monuments,pedestals.	5

III	**BASIC DRAWINGS**
	Standard symbols used in Civil Engineering Drawing.
	Draw the elevation of :
	    Fully panelled double leaf door.
	    Fully Panelled single leaf door
	    Flush door
	    Fully Panelled window with grill
	    Partly glazed and partly panelled window
	    Lean- to – roof
	    King post roof truss
	    Steel roof truss
	    Rain water Harvesting– Recharging into the ground
	a. Shallow well system b. Percolation pit system.
		9

	BUILDING DRAWINGS Preparation of plan, section and elevation of buildings with specifications for the given line drawing to suitable Scale: A Reading room with R.C.C flat roof A House with single bed room and attached bathroom with R.C.C. flat roof. A residential building with two bed rooms with R.C.C. flat roof A Two roomed house with RCC slope roof with gable ends A Small workshop with north light steel roof truss (6 to 10m Span) over R.C.C. Columns. A Primary health center for rural area with R.C.C roof. A Village Library building with R.C.C flat roof A small Restaurant building with R.C.C flat roof A Single storied School building with R.C.C flat roof A Bank building with R.C.C flat roof. A Two storied Bangalow (Not for Exam)	
IV		**38**
	Test & Model Exam	**7 Hrs.**

AUTONOMOUS EXAMINATION

SCHEME OF VALUATION
ALLOCATION OF MARKS

PART A From unit I and II (2 x 4),Unit III (1 x 12)	20 Marks
PART b From IV	80 Marks
Total	**100 Marks**

Note: *Board Examinations will be conducted for 100 Marks and converted to 75 Marks.

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name   :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F3401
Term   :   III
Course Name   :   CIVIL ENGINEERING DRAWING AND CAD PRACTICAL – I

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Board Examinations	Total		
CIVIL ENGINEERING DRAWING AND CAD PRACTICAL – I	4	64	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

Computers play a very vital role in present day life, more so, in all the professional life of engineering. In order to enable the students, use the computers effectively in drafting, this course offers Computer Aided Drafting of various drawings in civil engineering.

OBJECTIVES:

On completion of the course, the students will be able to

- Know about CAD commands
- Understand building components
- Draw building drawing using CAD software
- Prepare approval drawing for submission to authority

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F3401-CO1	Ability to understand various commands used in CAD software. Simple Exercises for familiarizing the drawing commands in CAD software	**U-2**
1F3401-CO2	Ability to arrangement of various area with furniture / fixtures and other features with standard sizes	**U-2**
1F3401-CO3	Ability to analyse on CADD commands in making simple steel section Drawings.	**A-4**
1F3401-CO4	Ability to create Plan, Section and Elevation for different types of buildings.	**C-6**
1F3401-CO5	Ability to create Approval drawings using CADD.	**C-6**

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

DETAILED SYLLABUS
LIST OF EXPERIMENTS

Preparation of drawing using CAD Software

Introduction of CAD software for Preparation of Drawings   5 Hours
1. Definition of various commands used in CAD software.
2. Simple Exercises for familiarizing the drawing commands in CAD software.

PART - A

Draw the given drawings in Computer and take print out of all drawings in A4 sheet using Inkjet / laser printer or plotter and produced in file forms as record.

1. Section of semicircular Arch
2. Elevation of door, partly paneled and partly glazed
3. Preparation of Plan showing   arrangement of   furniture / fixtures and other features with standard sizes for the followings (Each roomto be drawn separately- features and furniture may be pasted from the Blocks available in the packages

    (i)Living   (ii) Bed Room   (iii) Kitchen   (iv) Toilet
4. Steel Structures: Cross section of I, Channel, T, Angle and Tubular section, Compound Beams.
5. Section of Load bearing wall from parapet to foundation showing all the details across the section. (Single storey)

PART B

Draw the building drawing using available CAD software

6. Plan, Section and Elevation of a single bed roomed building (R.C.C. Roof)
7. Plan, Section and Elevation of a Double bed roomed building (R.C.C. Roof)
8. Plan, Section and Elevation of a Primary School Building
9. Plan, Section and Elevation of a Hospital Building
10. Plan, Section and Elevation of a Workshop with steel columns, Steel roof truss andMetal sheet Roofing of about 300 m^2 area.
11. Preparation of approval drawing to be submitted to Corporation or Municipalityshowing required details in one sheet such as
    a) Site Plan (Land boundary, Building boundary, Car Parking, Passage, sanitarylayout, septic tank location etc.
    b) G.F. Plan, F.F. Plan, Section and Elevation (line diagram is enough)
    c) Key Plan
    d) Septic tank Plan and section (line diagram)
    e) Rain water harvesting pit (with all detail)
    f) Typical foundation details (Column foundation or spread footing)
    g) Title block showing – joinery details, Specification, Area statement, colour Index, Title of the property, space for owners Signature and Licensed Surveyor's Signature with address.

AUTONOMOUS EXAMINATION
SCHEME OF VALUATION
ALLOCATION OF MARKS

PART – A	45 marks
PART – B	50 marks
Viva – voce	5 marks
TOTAL	**100 marks**

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No.	List of the equipments	Quantity Required
1.	Computers	30 Nos.
2.	Laser printer	3 Nos.
3.	CAD software	30 Users

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F3205
Term : III
Course Name : MATERIAL TESTING LAB-I

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
MATERIAL TESTING LAB-I	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The understanding of the structural, physical and mechanical properties and behavior of engineering materials is at the very core of engineering design. A command of this knowledge is essential for all civil engineers. This laboratory provides a hands-on experience with the testing and evaluation of civil engineering materials, including steel, wood, Cements, Aluminium, Brass and Brick.

OBJECTIVES:

On completion of the course, the students will be able to:

- Study of UTM, Torsion testing machine, Hardness tester, Compression testing machine.

- Determine the Material Properties- test conducted on steel, wood, cement, Aluminium, Brass and Brick.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F3205-CO1	Ability to Test the impact, tension, compression and torsion	**A-4**
1F3205-CO2	Ability to Experiment Brinnel's / Rockwell's hardness	**A-3**
1F3205-CO3	Ability to Test on wooden cubes and solid blocks	**A-4**
1F3205-CO4	Ability to create cement mortar cubes	**E-5**
1F3205-CO5	Ability to Demonstrate the strain gauge, indicators and soundness.	**U-2**

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

DETAILED SYLLABUS
MATERIAL TESTING LABORATORY - I

Contents: Practical

Unit	Name of the Topics	Hours
PART A	Tension test on mild steel **/** deformed steel bars. Deflection test on Simply Supported Beams of a. wood and b. steel to find young`s modulus Torsion test on mild steel bar to determine the Modulus Double Shear test on M.S.bar. Impact Test on mild steel by performing Izod /Charpy tests.	**18 Hrs.**
PART B	Finding Brinnel's / Rockwell's hardness numbers of the following materials. a. Mild steel b. Brass c. Aluminium. Compression Test on Wooden cube. Compression test on Bricks /Solid Blocks. Water absorption test on Bricks /pressed tiles. Flexure test on Tiles.	**18 Hrs.**
PART C	**(Not for Examination)** Casting of cement mortar cubes and determining the composition strength. Demonstration of Strain gauges and Strain indicators. Demonstration of Soundness test on cement by Auto clave method.	**5 Hrs.**
	Test & Model Exam	**7 Hrs.**

	Total	48 Hrs.

AUTONOMOUS EXAMINATION
SCHEME OF VALUATION
ALLOCATION OF MARKS

S.No	Description	Part - A Max. Marks (50)	Part - B Max. Marks (45)
1.	Procedure	5	5
2.	Tabulation and Observation	20	20
3.	Calculations	15	10
4.	Sketch / Graph	5	5
5.	Accuracy of result	5	5
6.	Viva	5	

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No.	List of the Equipments	Quantity
1.	UTM	1 no.
2.	Rock well-cum-Brinell Hardness testing machine	1 no.
3.	Torsion testing machine	1 no.
4.	Impact testing machine for Izod and Charpy test	1 no.
5.	Deflection test verification of Maxwell theorem with magnetic stand, deflection gauge, weights and sets of beam (floor type)	1 no.
6.	Weighing balance-digital 10 kg capacity one gram accuracy with battery backup 8 hours/direct electrical connection	1 no.
7.	Compression testing machine 100 tons capacity (electrical operated)	1 no.
8.	Flexural Testing Machine for Tiles	1 no.
9.	Spring testing Apparatus	1 no.
10.	Double shear test apparatus	1 no.

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F3206
Term : III
Course Name : SURVEYING PRACTICE-I

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
SURVEYING PRACTISE-I	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.
RATIONALE:
         The important functions of a diploma civil engineer include the jobs of detailed surveying, plotting of survey data, preparation of survey maps and setting out works. Field work should be a selected one so that the student can check his work and have an idea of the results and the extent of error in the work done by him. As far as possible, the surveys done should be got plotted, as this will also reveal errors in the work and Develop skill in plotting
OBJECTIVES:
On completion of the course, the students will be able to:
• Handle surveying equipments
• Do practical exercises in Chain surveying, Compass surveying, Levelling and GPS.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F3206 –CO1	Ability to take measurement and plotting in the field using chain survey.	**A-4**
1F3206 –CO2	Ability to take measurement of stations by observations of bearing and included angle in the field using compass survey.	**A-4**
1F3206 –CO3	Ability to determine latitude, longitude using GPS. Ability to take measurement in the field using compass survey.	**A-3**
1F3206 –CO4	Ability to estimate the measurement of height by fly levels in the field using dumpy level.	**U-2**
1F3206 –CO5	Ability to determine the inverted levels in the field using dumpy level.	**A-3**

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

DETAILED SYLLABUS
PART A
1. CHAIN AND COMPASS SURVEYING

Study of chain, tape and accessories used for chain survey. Study of Prismatic compass, setting up over a station and observe bearings of lines. Running closed traverse and finding the included angles Use Chain / Tape and Compass. Minimum 5 points. Determination of distance between two points when their base is accessible. Use Chain / Tape and Compass. Determination of distance between two points when their base is inaccessible. Use Chain / Tape and Compass.

2 GLOBAL POSITIONING SYSTEM (GPS)

Reading of various Maps like Taluk map, District Map and Topo sheets. Study of Hand held GPS. Measurement of Latitude, Longitude and Altitude using hand held GPS. Selection and marking of routings (Way points) using hand held GPS.

PART B 3. LEVELLING

Study of a Level - Temporary adjustment, taking readings and booking in a field book. Fly leveling Reduction by Height of Collimation method - Minimum 6 points with two change points (Minimum Two exercises) Fly leveling Reduction by Rise and Fall method - Minimum 6 points with two change points (Minimum Two exercises). Fly levelling covering minimum 6 points with 2 inverted readings (Minimum Two exercises). Check levelling and reduction of levels (Minimum Two exercises)

Test & Model Exam 7 Hrs

PART- A
1. CHAIN AND COMPASS SURVEYING

1. Study of chain, tape and accessories used for chain survey.
2. Study of Prismatic compass, setting up over a station and observe bearings of lines.
3. Running closed traverse and finding the included angles Use Chain / Tape and Compass. Minimum 5 points
4. Determination of distance between two points when their base is accessible. Use

Chain / Tape and Compass.

5. Determination of distance between two points when their base is inaccessible. Use Chain / Tape and Compass.

2. GLOBAL POSITIONING SYSTEM (GPS)

1. Study of Hand held GPS.
2. Reading of various Maps like Taluk map, District Map and Topo sheets.
3. Measurement of Latitude, Longitude and Altitude using hand held GPS.
4. Selection and marking of routings (Way points) using hand held GPS.

PART B

3. LEVELLING

1. Study of a Level - Temporary adjustment, taking readings and booking in a field book.
2. Fly leveling Reduction by Height of Collimation method - Minimum 6 points with two change points
3. Fly leveling Reduction by Rise and Fall method - Minimum 6 points with two change points
4. Fly levelling covering minimum 6 points with 2 inverted readings (Minimum Two exercises).Check levelling and reduction of levels.

AUTONOMOUS EXAMINATION
SCHEME OF VALUATION
ALLOCATION OF MARKS

Part A	By lot i. Compass Survey	35 MARKS
	ii.GPS	15 MARKS
Part B	Levelling (Compulsory)	45 Marks
	Viva -Voce	5 Marks
Total		**100Marks**

S.No	Description	Part - A Max. Marks (35)	Part - A Max. Marks (15)	Part - B Max. Marks (45)
1.	Procedure, Handling Instruments /Tools	5	3	5
2.	Field works, Observation and Tabulation	15	10	20
3.	Calculations and Check / drawings.	10	0	15
4.	Accuracy of result	5	2	5
5.	Viva-Voce	5		

DETAILED ALLOCATION OF MARKS

LIST OF EQUIPMENTS (for a batch of 30 students):

1. Chain with (arrows)   -   6 nos.
2. Prismatic compass   -   6 nos.
3. Dumpy level   -   10 nos.
4. Levelling staff   -   10 nos.
5. Cross staff   -   6 nos.
6. Ranging rod   -   2 nos.
7. Hand held GPS   -   6 nos.

IV TERM

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F 4301
Term : IV
Course Name : THEORY OF STRUCTURES

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Board Examinations	Total		
THEORY OF STRUCTURES	5	75	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Slope and deflection of beams & Propped cantilever	12
II	Fixed beam & Continuous beams- Theorem of three moments method.	12
III	Continuous beams-Moment distribution method & Portal frames- Moment distribution method.	12
IV	Columns and Struts & Combined Bending and direct stresses	12
V	Masonry Dams &Earth pressure and Retaining walls	12
Test & Model Exam		15
Total		**75**

RATIONALE:

The properties and behaviour of the components of the structure are very essential for the design purpose. It is covered in the subject of Mechanics of Structures - II as a guide line for decision making and checking ultimate capacity & serviceability of structure.

OBJECTIVES:

- At the end of this course, students will be able to determine the Slope and Deflection of determinate beams by area moment method.
- Analysis of propped cantilever, fixed beam, Continuous beam by Theorem of Three moment, and Continuous beams and portal frame by Moment Distribution Method and draw SFD, BMD.
- Define type of arches and analysis three hinged arch.
- Define different types of columns and to find critical load of columns.
- Analysis of columns and chimneys subject to eccentric loading and to find maximum & minimum stresses. Calculation of maximum, minimum stresses & checking stability of masonry dams and retaining walls.Solving problems in the course of study.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F4301-CO1	Ability to analyze the slope and deflection of cantilever simply supported and propped cantilever beams.	**A-4**
1F4301-CO2	Ability to deduce the slope and deflection of fixed beams, and S.F.D AND B.M.D of continuous beams by theorem of three moments.	**A-4**
1F4301-CO3	Ability to examine S.F.D AND B.M.D of continuous beam by moment distribution method	**R-1**
1F4301-CO4	Ability to figure out the crippling load combined bending and direct stresses on columns.	**A-3**
1F4301-CO5	Ability to evaluate the stability of dams and retaining walls.	**A-4**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**CHAPTER:1.1 SLOPE AND DEFLECTION OF BEAMS:** Deflected shapes / Elastic curves of beams with different support conditions –Definition of Slope and Deflection- Flexural rigidity and Stiffness of beams- Mohr's Theorems – Area Moment method for slope and deflection of beams – Derivation of expressions for maximum slope and maximum deflection of standard cases by area moment method for cantilever and simply supported beams subjected to symmetrical UDL & point loads – Numerical problems on determination of slopes and deflections at salient points of Cantilevers and Simply supported beams from first principles and by using formulae **CHAPTER:1.2 PROPPED CANTILEVERS** Statically determinate and indeterminate Structures- Stable and Unstable Structure .Examples- Degree of Indeterminacy- Concept of Analysis of Indeterminate beams - Definition of Prop –Types of Props-Prop reaction from deflection consideration –Drawing SF and BM diagrams by area moment method for UDL throughout the span, central and non-central concentrated loads– Propped cantilever with overhang – Point of Contra flexure.	12
II	**CHAPTER:2.1 FIXED BEAMS – AREA MOMENT METHOD** Introduction to fixed beam - Advantages –Degree of indeterminacy of fixed beam- Sagging and Hogging bending moments – Determination of fixing end(support) moments(FEM) by Area Moment method – Derivation of Expressions for Standard cases – Fixed beams subjected to symmetrical and unsymmetrical concentrated loads and UDL – Drawing SF and BM diagrams for Fixed beams with supports at the same level (sinking of supports or supports at different levels are not included) – Points of Contra flexure –Problems-Determination of Slope and Deflection of fixed beams subjected to only symmetrical loads by area moment method – Problems. **CHAPTER:2.2 CONTINUOUS BEAMS – THEOREM OF THREE MOMENTS METHOD** Introduction to continuous beams – Degree of indeterminacy of continuous beams with respect to number of spans and types of supports –Simple/Partially fixed / Fixed supports of beams- General methods of analysis of Indeterminate structures – Clapeyron's theorem of three moments – Application of Clapeyron's theorem of three moments for the following cases –Two span beams with both ends simply supported or fixed –Two span beams with one end fixed and the other end simply supported – Two span beams with one end simply	12

	supported or fixed and other end overhanging –Determination of Reactions at Supports- Application of Three moment equations to Three span Continuous Beams and Propped cantilevers –Problems- Sketching of SFD and BMD for all the above cases.		
III	**GEOMETRICAL PROPERTIES OF SECTIONS** **CHAPTER:3.1 CONTINUOUS BEAMS – MOMENT DISTRIBUTION METHOD** Introduction to Carry over factor, Stiffness factor and Distribution factor –Stiffness Ratio or Relative Stiffness- Concept of distribution of un balanced moments at joints - Sign conventions– Application of M-D method to Continuous beams of two / three spans and to Propped cantilever (Maximum of three cycles of distribution sufficient) –Finding Support Reactions- Problems - Sketching SFD and BMD for two / three span beams. **CHAPTER:3.2 PORTAL FRAMES – MOMENT DISTRIBUTION METHOD** Definition of Frames – Types – Bays and Storey - Sketches of Single/Multi Storey Frames, Single/Multi Bay Frames- Portal Frame – Sway and Non- sway Frames- Analysis of Non sway (Symmetrical) Portal Frames for Joint moments by Moment Distribution Method and drawing BMD only– Deflected shapes of Portal frames under different loading / support conditions.	12	
IV	**CHAPTER:4.1 COLUMNS AND STRUTS** Columns and Struts –Definition– Short and Long columns– End condition Equivalent length / Effective length– Slenderness ratio – Axially loaded short column - Axially loaded long column – Euler's theory of long columns – Derivation of expression for Critical load of Columns with hinged ends –Expressions for other standard cases of end conditions (separate derivations not required) – Problems – Derivation of Rankine's formula for Crippling load of Columns– Factor of Safety- Safe load on Columns- Simple problems **CHAPTER:4.2 COMBINED BENDING AND DIRECT STRESSES** Direct and Indirect stresses – Combination of stresses –Eccentric loads on Columns Effects of Eccentric loads / Moments on Short columns – Combined direct and bending stresses – Maximum and Minimum stresses in Sections– Problems – Conditions for no tension – Limit of eccentricity – Middle third rule – Core or Kern for square, rectangular and circular sections Chimneys subjected to uniform wind pressure –Combined stresses in Chimneys due to Self weight and Wind load- Chimneys of Hollow square and Hollow circular cross sections only – Problem	12	
V	**CHAPTER:5.1 MASONRY DAMS** Gravity Dams – Derivation of Expression for maximum and minimum		

	stresses at Base – Stress distribution diagrams – Problems – Factors affecting Stability of masonry dams – Factor of safety- Problems on Stability of Dams– Minimum base width and maximum height of dam for no tension at base – Elementary profile of a dam – Minimum base width of elementary profile for no tension.	
	CHAPTER:5.2 EARTH PRESSURE AND RETAINING WALLS Definition – Angle of repose /Angle of Internal friction of soil– State of equilibrium of soil – Active and Passive earth pressures – Rankine's theory of earth pressure – Assumptions – Lateral earth pressure with level back fill / level surcharge (Angular Surcharge not required)– Earth pressure due to Submerged soils – (Soil retained on vertical back of wall only) – Maximum and minimum stresses at base of Trapezoidal Gravity walls – Stress distribution diagrams – Problems – Stability of earth retaining walls – Problems to check the stability of walls- Minimum base width for no tension.	12

Text Books:

SI.No.	Title	Author	Publisher
1.	Theory of structures - 2000	R.S.kurmi	S.Chand

Reference Book:

SI.No.	Title	Author	Publisher
1.	Theory of structures – 9th edition - 2014	S.Ramamrutham	Dhanpatrai publishing company (p) Ltd.
2.	Theory of structures - 2017	P.C.Punmia	Laxmi publication
3.	Mechanics of structures - 2015	S.B.Junnarkar	Charotar publishing house pvt. Ltd.
4.	Structural analysis - II- 2013	S.S.Bhavikatti	Vikas publishing house

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA CIVIL ENGINEERING IN SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F4302

Term : IV

Course Name : TRANSPORTATION ENGINEERING

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Asses	Board Examinations	Total	
TRANSPORTATION ENGINEERING	5	80	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Highway Engineering	15
II	Highway Engineering (Contd.)	15
III	Railway Engineering	15
IV	Railway Engineering (Contd.)	14
V	Bridge Engineering	14
	Test & Model Exam	7
	Total	**80**

RATIONALE:

Construction of roads is one of the areas in which diploma holders in Civil Engineering get employment. These diploma holders are responsible for construction and maintenance of highways. Basic concepts of road geo-metrics,

surveys and plans, elements of traffic engineering, road materials, construction of rigid and flexible pavements, special features of hill roads, road drainage system and various aspects of maintenance find place in above course.

In addition, this subject will cater the needs of those technicians who would like to find employment in the construction of railway tracks, bridges. The subject aims at providing broad based knowledge regarding various components and construction of railway track, bridges.

OBJECTIVES:

On completion of the course, the students will be able to:
- Study the importance of the roads, development of roads and classification of roads.

- Know about highway pavements, Geometrical design, Traffic controls, RoadArboriculture and Highway Lighting
- Study the highway alignment, road machineries and construction of different typesof Roads
- Study the Railway fixtures, Types of stations, Signalling and Control of movement oftrains
- Study the Maintenance of Track and Rapid Transport System of Railways

- Know about Bridges, Classifications and its Components

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F4302-CO1	Ability to evaluate Objects of Highway planning , I S Classification of soils	**A-4**
1F4302-CO2	Ability to estimate Principles for ideal highway alignment, Factors considered in alignment	**U-2**
1F4302-CO3	Ability to Illustrate the Classifications of Indian Railways, Maintenance of Track, Bridges and Rolling stock	**A-2**
1F4302-CO4	Ability to Understand Purpose of railway station& - Types of stations, Underground railways	**U-2**
1F4302-CO5	Ability to Evaluate IRC loadings and Importance of bearings	**A-4**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**CHAPTER:1.1** **INTRODUCTION:** General –Development of Roads in India - Modes of transportation -Nagpur Plan - Ribbon development -Advantages of Roads - Importance of roads in India - Requirements of an ideal road - Indian Road Congress - Objects of Highway planning - Classifications of Highways. **CHAPTER:1.2 HIGHWAY PAVEMENTS:** Objectives – Types of Pavement – Flexible and Rigid Pavements - Comparative study of Flexible and Rigid pavements - Factors affecting the design of pavements - Other types of pavements (Description not reqd.) **CHAPTER:1.3 GEOMETRICAL DESIGN OF HIGHWAYS:** General - Road structure - Right of way - Land width - Width of formation - Road Camber - Super elevation -Sight distances -Road gradient -Road Curves - Horizontal curves-Vertical curves -Types - Widening of pavement on horizontal curves. **CHAPTER:1.4 TRAFFIC ENGINEERING:** Objectives -Traffic surveys- Road accidents-Causes of road accidents - Preventive measures - Parking – Methods of parking - Road junctions (Grade intersections and Grade separators) - Traffic signals - Advantages - Types of road sign -Expressways. **CHAPTER:1.5 SUB GRADE SOIL:** Significance - Soil mass as a three phase system - Grain size-classification- Atterberg limit - Definition and description- IS Classification of soils- Compaction Definition - Objects of compaction - Standard Proctor Compaction test - Shear strength - Definition - importance - Direct shear test. **CHAPTER:1.6 ROAD ARBORICULTURE AND LIGHTING:** Objects of Arboriculture - Selection of trees - Location of trees - Highway lighting - benefits.	15
II	**HIGHWAY ENGINEERING (Contd.):** **CHAPTER:2.1 HIGHWAY ALIGNMENT AND SURVEYS:** Definition –Principles for ideal highway alignment -Factors affecting highway alignment –Surveys-Engineering surveys -Reconnaissance, Preliminary and Location surveys - Project Report and Drawing - Highway Re-alignment projects **CHAPTER:2.2 ROAD MACHINERIES:** Excavating equipments-Tractor, Bull dozer, Grader, Scraper, J C B - Compaction equipments -Road roller -Types and description -	15

	Equipment for Bituminous road.	
	CHAPTER:2.3 LOW COST ROADS: General-Classifications -Earthen road, Gravel road, Water Bound Macadam roads - Construction with sketches – Advantages and disadvantages - Maintenance - Soil stabilization - Methods. **CHAPTER:2.4 BITUMINOUS ROADS:** General - Advantages and disadvantages - Bituminous materials used - Types of Bituminous roads-Surface dressing -Types-Bituminous Concrete - Maintenance of Bituminous roads. **CHAPTER:2.5 CEMENT CONCRETE ROADS:** General - Advantages and disadvantages - Methods of construction of cement concrete roads with sketches - Construction procedure for concrete roads. **CHAPTER:2.6 HILL ROADS:** Factors considered in alignment -Formation of hill roads- Hairpin bends -Retaining and Breast walls. **CHAPTER:2.7 PARKING** Latest & Advanced parking Facilities at Metro Cities	
III	**RAILWAYENGINEERING:** **CHAPTER:3.1 INTRODUCTION:** Introduction to Railways -Classifications of Indian Railways -Rail Gauges - Types - Uniformity in gauges - Loading gauge-Construction gauge. **CHAPTER:3.2 RAILS:** General-Functions of rails -Requirements of an ideal rail - Types of rail sections - Length of rails -Welding of rails - Wear of rails - Coning of wheels - Hogged rails - Bending of rails – Creep of rails - Causes and prevention of creep. **CHAPTER:3.3 SLEEPERS AND BALLAST:** Functions of Sleepers - Types of sleepers - Requirements of sleepers - Materials for sleepers - Sleeper density – Ballast-Functions of Ballast – Requirements of ballast -Materials used as ballast. **CHAPTER:3.4 RAIL FASTENINGS AND PLATE LAYING:** Rail joints -Types –Rail fastenings -Fish plates -Fish bolts-Spikes – Chairs and Keys -Bearing plates -Blocks - Elastic fastenings – Anchors and anti-creepers - Plate laying- Methods of plate laying - PQRS method of relaying. **CHAPTER:3.5 MAINTENANCE OF TRACK:** Necessity - Maintenance of Track, Bridges and Rolling stock	15

IV	**RAILWAY ENGINEERING (Contd.)** **CHAPTER:4.1 STATIONS AND YARDS:** Definition of station -Purpose of railway station - Types of stations - Wayside, Junction and Terminal stations -Platforms- Passenger and Goods platforms - Definition of Yard -Types of yard - Passenger yard, Goods yard, Marshalling yard and Locomotive yards - Level crossings. **CHAPTER:4.2 STATION EQUIPMENTS:** General - Engine shed - Ash pits – Examination pits - Drop pits – Water columns - Triangles – Turn table - Traverse –Scotch Block – Buffer stops – Fouling marks - Derailing switch - Sand hump - Weigh bridges. **CHAPTER:4.3 POINTS AND CROSSINGS** Purpose – Some definitions – Turnouts – Right hand and left hand turnouts –Sleepers laid for points and crossings - Types of switches - Crossings - Types of crossings. **CHAPTER:4.4 SIGNALLING:** General – Objects of signalling - Types of signalling –Based on function and location – Special signals – Control of movement of trains –Different methods Following train system - Absolute block system – Automatic signalling - Pilot guard system - Centralized traffic control system. **CHAPTER:4.5** **INTERLOCKING:** Definition – Principles of interlocking - Methods of interlocking-Tappets and locks system –Key system - Route relay system - Improvements in interlocking and signalling. **CHAPTER:4.6** **RAPIDTRANSPORTSYSTEM:** General - Underground railways - Advantages - Tube railways - Its features.-	**14**
V	**CHAPTER:5.1** **INTRODUCTION:** Bridge: Definition- Components of bridge- IRC loadings- Selection of type of bridge- Scour- Afflux- Economic span- Waterway- Factors governing the ideal site for bridge- Alignmentof bridge -Factors to be considered in alignment. **CHAPTER:5.2 FOUNDATIONS:** Functions of foundation- Types of foundations-Selection of foundations- Control of ground water for foundation-Caisson foundation -Coffer dam–Types. **CHAPTER:5.3 CLASSIFICATION OF BRIDGES:** Classification according to IRC loadings, Materials, Bridge floor,	**14**

	Type of superstructure-Culverts and Cause ways- Classifications with sketches - Conditions to construct causeways. **CHAPTER:5.4 SUBSTRCTURE :** Abutments – types – piers – types – wing walls – types. **CHAPTER:5.5 SUPERSTRUCTURE** Types- Description-Simple bridge- Types according to bridge floor - Continuous bridge - Cantilever bridge - Balanced cantilever bridge- Arch bridge - Bow-string girder type bridge- Rigid frame bridge- Suspension bridge- Continuous steel bridges- Steel arched bridges. **CHAPTER:5.6** **BRIDGE BEARINGS:** Definition -Purpose-Importance of bearings – Types of bearings– Elastomer bearings-pot bearing	
Test &model exam	**7**

Text Books:

Sl.No.	Title	Author	Publisher
1	Highway Engineering	Rangwala	Charator publishing (Edition 2010)

Reference Books

Sl.No.	Title	Author	Publisher
1	Railway Engineering (Edition 2010)	Rangwala ,	Charator publishing
2	Bridge Engineering (Edition 2009)	Rangwala ,	Charator publishing
3	A Text Book Of Transportation Engineering (2008)	S.P.Chandola ,	S.Chand& company LTD.
4	Principles of Transportation & Highway Engineering	G.V.Rao ,	Tata McGraw-hill Publishing Company LTD.

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F 4207
Term   :   IV
Course Name   :   Hydraulics

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours/ Week	Hours/ Semester	Marks				
			Internal Assessment	Board Examination	Total	Duration	
HYDRAULICS	**6 Hrs.**	**96 Hrs.**	**25**	**100***	**100**	**3 Hrs.**	

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks

Topics and Allocation of Hours:

Unit	Topics	Hours
I	Introduction of measurement of Pressure Hydrostatic Pressure on Surfaces	20
II	Flow of fluids, Flow through Orifices and Mouthpieces, Flow through	20
III	Flow through Notches and Flow through weirs	16
IV	Flow through Open channels	15
V	Pumps	18
	Test & Model Exam	7
	Total	**96**

RATIONALE:

Subject of hydraulics is a science subject and helps in solving problems in the field of Aeronautical, Electronics, Electrical, Mechanical, Metallurgical Engineering subject. The subject deals with basic concepts and principles in hydrostatics, hydro- kinematics and hydrodynamics and their application in solving fluid flow problems.

OBJECTIVES:

On completion of the course, the students will be able to:

- Define the properties of fluids and their physical quantities.
- List the different types of pressures and various pressure measuring devices.
- Calculate hydrostatic forces on plane surfaces immersed in water.
- Understand types of forces, energy and application of Bernoulli's theorem.
- Know the different types of Orifices and Mouthpieces and to derive dischargeformulae and their practical applications.
- State the different losses of head of flowing liquids in pipes and their equations.
- Know the different types of Notches and Weirs, and deriving the discharge formulasand their Practical applications.
- Study the different types of Channels and their discharge formulas and to determinethe condition for maximum discharge.
- Learn the construction details, specifications and efficiencies of ReciprocatingPumps and Centrifugal Pumps

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F4207 -CO1	Ability to deduce the different types of pressure.	**A-4**
1F4207 -CO2	Ability to organize the flow of fluids and hydraulic co-efficient.	**A-6**
1F4207 -CO3	Ability to organize the flow of fluids through notches and weirs.	**A-4**
1F4207 -CO4	Ability to organize the flow of fluids through pipes and channels.	**A-6**
1F4207 -CO1	Ability to illustrate the construction details, specifications, discharge, power and efficiency of pumps.	**A-3**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**CHAPTER :1.1 INTRODUCTION** Hydraulics –Definition-Properties of fluids - Mass, force, weight, specific volume, specific gravity, specific weight, density, relative density, compressibility, viscosity, cohesion, adhesion, capillarity and surface tension-Dimensions and Units for area, volume, specific volume, velocity, acceleration, density, discharge, force, pressure and power.	**6**
	CHAPTER :1.2 MEASUREMENT OF PRESSURE Pressure of liquid at a point — Intensity of pressure - Pressure head of liquid – Conversion from intensity of pressure to pressure head and vice- versa - Formula and Simple problems - Types of pressures - Static pressure, Atmospheric pressure, Gauge pressure, Vacuum pressure and Absolute pressure-Simple problems - Measurement of pressure - Simple mercury barometer - Pressure measuring devices-Piezometer tube - Simple U-tube manometer - Differential manometer – Micrometer - Problems.	**9**
	CHAPTER :1.3 HYDROSTATIC PRESSURE ON SURFACES Pressure on plane surfaces - Horizontal, vertical and inclined surfaces-Total pressure-Centre of pressure - Depth of centre of pressure - Resultant pressure — Problems on Practical application - Sluice gates, Lock gates and Dams- Descriptions.	**5**
II	**CHAPTER :2.1 FLOW OF FLUIDS** Types of flow – Laminar and turbulent flow - Steady and unsteady flow –Uniform and Non-uniform flow - Equation for continuity of flow (law of conservation of mass)- Energy possessed by a fluid body - Potential energy and Potential Head –Pressure energy and Pressure Head - Kinetic Energy and Kinetic Head - Total Energy and Total Head –Bernoulli"s theorem — (No proof) – Problems on Practical applications of Bernoulli"s theorem- Venturimeter - Orificemeter (Derivation not necessary) - Simple problems.	**8**
	CHAPTER :2.2 FLOW THROUGH ORIFICES AND MOUTHPIECES Definitions- Types of orifices - Vena contracta and its significance – Hydraulic coefficients Cd, Cv and Cc - Formula - Simple problems - Large orifice — Definition — Discharge formula — Simple problems - Practical applications of orifices – Types of mouthpieces - External and internal mouthpieces - Discharge formula - Simple problems.	**6**
	CHAPTER :2.3 FLOW THROUGH PIPES Definition of pipe-Losses of head in pipes – Major losses - Minor losses - Sudden enlargement, sudden contraction, obstruction in pipes (no proof)- Simple problems – Energy / Head losses of flowing fluid due to friction - Darcy"s equation - Chezy"s equation (No derivation) —	**6**

		Problems - Transmission of power through pipes – Efficiency - Pipes in parallel connected to reservoir - Discharge formula - Simple problems.	
III		**CHAPTER :3.1 FLOW THROUGH NOTCHES** Definitions- Types of notches – Rectangular, Triangular and Trapezoidal notches – Derivation of equations for discharges - Simple problems - Comparison of V-Notch and Rectangular Notch.	**6**
		CHAPTER :3.2 FLOW THROUGH WEIRS Definitions - Classification of weirs - Discharge over a rectangular weir and trapezoidal weir – Derivation – Simple problems – End contractions of a weir – Franci"s and Bazin"s formula – Simple problems - Cippoletti weir – Problems - Narrow crested weir – Sharp crested weir with free over fall - Broad crested weir - Drowned or Submerged weirs - Suppressed weir - Stepped weir – Problems - Definition of terms - Crest of sill, Nappe or Vein, Free discharge - Velocity of approach –Spillways.	**10**
IV		**CHAPTER :4.1 FLOW THROUGH OPEN CHANNELS** Definition - Classification - Rectangular and Trapezoidal channels – Discharge – Chezy"s formula, Bazin"s formula and Manning"s formula - Hydraulic mean depth – Problems - Conditions of rectangular/trapezoidal sections - Specific energy, critical depth –Conditions of maximum discharge and maximum velocity - Problems - Flow in a venturiflume – Uniform flow in channels – Flow through a sluice gate – Types of channels – Typical cross- sections of irrigation canals - Methods of measurements of velocities – Channel losses - Lining of canals – Advantages of lining of canals - Types of lining- Cement concrete lining with sketches - Soil cement lining with sketches – LDPE lining.	**15**
V		**CHAPTER :5.1 PUMPS** Pumps – Definition – Difference between a pump and a turbine- Classification of pumps - Positive displacement pumps and roto- dynamic pressure pumps - Characteristics of modern pumps - Maximum recommended suction, lift and power consumed- Reciprocating pump - Construction detail and working principle - Types - Single acting and Double acting -Slip -Air vessels- Discharge and Efficiency- Problems - Centrifugal pump Advantages and disadvantages over a reciprocating pump - Layout - Construction details – Priming of centrifugal pump – Working of the pump – Classification – Functions of Foot valve, Delivery valve and Non- return valve – Fundamental equation of centrifugal pump - Characteristics of a centrifugal pump – Discharge, power and efficiency - Problems - Specifications of centrifugal pumps and their sections- Hand pump - Jet pump- Deep well pump - Plunger pumps - Piping system- Computation of power required for pumps, Other types of pumps (not for exam)- Selection and choice of pump.	**18**
	Test & Model Exam		**7 Hrs.**

Reference Books

SI.No.	Title	Author	Publisher
1	Hydraulics, Fluid Mechanics and Hydraulic Machines	Dr. Jagadish Lal	Metropolitan Book Company- New Delhi
2	Fluid Mechanics	P.N. Modi & S.M. Sethi	Standard Publishers – New Delhi
3	Hydraulics, Fluid Mechanics and Hydraulics Machines	S. Ramamirtham	Dhanpat Rai& Sons, New Delhi
4	Fluid Mechanics	K.L.Kumar	Eurasa Publshing House – New Delhi
5	Fluid Mechanics	R.K. Bansal	Lakshmi Publications
6	Fluid Mechanics	Prof. S. Nagarathinam	Khanna Publishers – New Delhi
7	Hydraulics, Fluid Mechanics and Hydraulics Machines	K.R. Arora	Standard Publishers & Distributors, New
8	Fluid Mechanics and Machinery	B C S Rao	Tata-McGraw-Hill Pvt. Ltd., New Delhi

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name   :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F4208
Term   :   IV
Course Name   :   HYDRAULICS LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				Duration
	Hours / Week	Hours / Semester	Marks				
			Internal Assessment	Board Examinations	Total		
HYDRAULICS LABORATORY	4	64	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

Subject of hydraulics lab is a practical subject which deals with the basic concepts and principles in hydrostatics, hydro-kinematics and hydrodynamics and their applications insolving fluid flow problems.

OBJECTIVES:
On completion of the course, the students will be able to:
- Understand parameters associated with fluid flow and hydrostatic pressure.
- Measure the fluid pressure using manometers
- Determine the co-efficient of discharges of Orifice, mouthpiece, orifice meter, venturimeter, notches etc.,
- Determine pipe friction factor

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F4208 -CO1	Ability to Experiment the Bernouli's Theorem , Venturi and orifice meter	**A-3**
1F4208 -CO2	Ability to Determine the co efficient of Discharge through orifice And with External cylindrical mouth piece	**A-3**
1F4208 -CO3	Ability to Test the friction factor	**E-5**
1F4208 -CO4	Ability to Determine the co efficient of discharge with rectangular and V notch	**A-3**
1F4208 -CO5	Ability to Draw the Reciprocating pump Centrifugal pump	**A-3**

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

DETAILED SYLLABUS
HYDRAULICS LABORATORY
Contents: Practical

List of Experiment	Hours

Flow of Fluids:
    Verification of Bernoulli"s theorem.
 Flow through Venturimeter – Determination of Co-efficient of Discharge.
 Flow through Orificemeter – Determination of Co-efficient of Discharge.
Flow through orifice:
   Determination of Co-efficient of Discharge by Time fall - Head method
   Determination of Co-efficient of Discharge by Constant head method.
Flow through external cylindrical mouth piece:
   Determination of Co-efficient of Discharge by Timing fall in head method
   Determination of Co-efficient of Discharge by Constant head method
Flow through pipes:
   Determination of friction factor for the given GI pipe / PVC pipe.
Flow through notch:
   Determination of Co-efficient of Discharge for Rectangular Notch / V-Notch
Pumps:
   Reciprocating pump – To draw characteristic curves and determine the efficiency
   Centrifugal pump – To draw characteristic curves and determine the efficiency
   Study of working principle of a pelton wheel.
	57

Test & Model Exam	**7 Hrs.**
Total	**64 Hrs.**

AUTONOMOUS EXAMINATION
SCHEME OF VALUATION

In the examination question has to be given either as a single question from Part A or two questions, one from Part B and another from Part-C.

ALLOCATION OF MARKS

S.No	Description	Marks
1	Procedure	10
2	Tabulation and Observation	35
3	Calculations	30
4	Sketch / Graph	15
5	Accuracy of result	5
6	Viva-Voce	5
	Total	**100**

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No.	List of Equipments required	Quantity required
1.	Bernoulli's theorem apparatus (closed circuit)	1 No.
2.	Venturimeter/Orificemeter apparatus (closed circuit) with all accessories	1 No.
3.	Pipe Friction apparatus (closed circuit) with all accessories	1 No.
4.	Orifice/Mouthpiece apparatus (closed circuit) with all accessories	1 No.
5.	Notch apparatus (closed circuit) with accessories	1 No.
6.	Reciprocating Pump test rig with accessories	1 No.
7.	Centrifugal Pump test rig	1 No.
8	Pelton wheel	1 No.

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F4303
Term : IV
Course Name : MATERIAL TESTING LAB-II

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				Duration
	Hours / Week	Hours / Semester	Marks				
			Internal Assessment	Board Examinations	Total		
MATERIAL TESTING LAB-II	4	64	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The understanding of the structural, physical and mechanical properties and behaviour of engineering materials is at the very core of engineering design. A command of this knowledge is essential for all civil engineers. This laboratory provides hands-on experience with the testing and evaluation of civil engineering materials, including sand, clay, fine aggregates, course aggregates and water.

OBJECTIVES:

On completion of the course, the students will be able to:
- Test the properties of fine aggregate and coarse aggregate.
- Test the properties of soil.
- Analyze the properties of water/waste water

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F4303 -CO1	Ability to Determine the voids ratio porosity, liquid limit , plastic limit, bulk density and specific gravity of Fine Aggregates	**A-3**
1F4303 -CO2	Ability to Determine the bulk density and specific gravity of coarse Aggregates Proctor's compaction test on soil. Direct shear test. Field Density of Soil by core cutter method / sand replacement method.	**A-3**
1F4303 -CO3	Ability to Test Attrition , Abrasion and Crushing value on Aggregate	**E-5**
1F4303-CO4	Ability to Test Aggregate impact value, Water absorption of coarse aggregate and Total solids present in the given sample of water.	**E-5**
1F4303-CO5	Ability to Determine the Total solids, settleable solids and Turbidity	**A-3**

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

DETAILED SYLLABUS
MATERIAL TESTING LABORATORY - II

Contents: Practical

Unit	Name of the Topics	Hours
PART A	Determination of Voids ratio and porosity of sand. Determination of liquid limit and plastic limit of the given soil. Determination of bulk density and specific gravity of Fine aggregates. Determination of bulk density and specific gravity of Coarse aggregates. Proctor's compaction test on soil. Direct shear test on sand. Field Density of Soil by core cutter method / sand replacement method.	**20 Hrs.**

PART B	Attrition test on Aggregate.	12 Hrs.
	Abrasion test on Aggregate.	
	Aggregate crushing value test.	
	Aggregate impact value test.	
	Determination of Water absorption of coarse aggregate.	
PART C	Determination of Total solids present in the given sample of water.	9 Hrs.
	Determination of Turbidity of water by "Jackson candle turbidity meter."	
	Determination of settleable solids present in the given sample of water/ waste waterby "Imhoff cone."	
	Determination of Chloride in the given sample water.	
	Test & Model Exam	**7 Hrs.**
	Total	**48 Hrs.**

AUTONOMOUS EXAMINATION
SCHEME OF VALUATION

In the examination question has to be given either as a single question from Part A or two questions, one from Part B and another from Part-C.

ALLOCATION OF MARKS

S.No	Description	Part - A Max.Marks (95)	Part - B Max.Marks (50)	Part - C Max.Marks (45)
1.	Procedure	10	5	5
2.	Tabulation and Observation	40	25	20
3.	Calculations	30	10	10
4.	Sketch / Graph	10	5	5
5.	Accuracy of result	5	5	5
	TOTAL	95	50	45
	VIVA VOCE	5	5	
	GRAND TOTAL	**100**	**100**	

LIST OF EQUIPMENTS(for a batch of 30 students):

S.No.	List of equipments required	Quantity Required
1.	Pycnometer	4 nos.
2.	Liquid limit device with all accessories	2 nos.
3.	Field density of soil apparatus (sand pouring cylinder) with complete set	2 nos.
4.	Proctor compaction mould with all accessories	2 nos.
5.	Direct shear machine with complete accessories	1 no.
6.	Devals attrition testing machine with complete	1 no.
7.	Dorry"s abrasion testing machine with complete	1 no.
8.	Aggregate impact testing machine with complete	1 no.
9.	Crushing strength apparatus	1 no.
10.	Jackson Candle Turbidity Meter	1 no.
11.	Imhoff Cone	1 no.

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F 4304
Term   :   IV
Course Name   :   CONSTRUCTION PRACTICE LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examination	Total	Duration
Construction Practice Laboratory	4 Hrs.	64 Hrs.	25	100*	100	3 Hrs.

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

       Diploma holders in Civil Engineering are supposed to supervise construction of buildings. To perform the above task, it is essential that students should have knowledge of various sub components of buildings like foundations, walls, roofs, stair cases, floors etc., and their constructional details. Therefore, the subject of Construction Practice is very important for Civil Engineering diploma holders.

OBJECTIVES:

On completion of the course, the students will be able to:

- Prepare center line plan and foundation plan for a building.
- Set out foundation in the field for spread footing and column footing for a building.
- Determine the Workability of concrete by Compacting factor, slump cone test andVee - Bee consistometer test.
- Cast Concrete cubes and to test for compressive strength.
- Determine the fineness Modulus of fine and coarse aggregate.
- Perform Shape test on coarse aggregate.
- Determine the bulking characteristics of the given sand.

- Perform Non-Destructive test on hardened concrete

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F4304 -CO1	Ability to understand the arrangements of bricks using English Bond in one brick thick/one and half brick at corner, Tee junction and pillars.	U-2
1F4304 -CO2	Ability to measure flooring,/brick work /colour washing.	E-5
1F4304 -CO3	Ability to estimate centre line dimension and setting out foundation plan in the field.	A-4
1F4304 -CO4	Ability to estimate centre line dimension and setting out foundation plan in the field.	A-4
1F4304 -CO5	Ability to understand the arrangements of bricks using English Bond in one brick thick/one and half brick at corner, Tee junction and pillars.	U-2

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

DETAILED SYLLABUS

CONSTRUCTION PRACTICE LABORATORY

Contents: Practical

Part A   **27 Hrs.**

- Identify various sizes of available coarse aggregates from sample of 10 kg in laboratory and prepare report (60,40, 20,10 mm).
- Identify the available construction materials in the laboratory on the basis of theirsources.
- Identify the grain distribution pattern in given sample of teak wood in the laboratory and draw the various patterns. (along and perpendicular to the grains).
- Identify various layers and types of soil in foundation pit by visiting at least 3 construction sites in different locations of city and prepare report consisting photographs and samples.
- Select first class, second class and third class bricks from the stake of bricks and prepare report on the basis of its properties.
- Measure dimension of 10 bricks and find average dimension and weight. Perform field tests - dropping, striking and scratching by nail and correlate the results obtained.
- Apply the relevant termite chemical on given damaged sample of timber.
- Apply two or more coats of selected paint on the prepared base of a given wall surface for the area of 1m x 1m using suitable brush/ rollers adopting

safe practices.

- Prepare mortar using cement and Sand/ Fly ash or Granite/marble polishing waste in the proportion 1:6 or 1:3.

Part B   **30 Hrs.**

- Prepare and develop a centre line plan, foundation Plan and set o spread footing in the field for the given line sketch of a building.
- Prepare and develop a centre line plan, foundation Plan and set out the layout of columns and footing in the field for the given line sketch of a building(Framed structure).
- Arrangement of bricks using English bond for one brick thick wall and one and half brick thick wall for right angled corner junction.
- Arrangement of bricks using English Bond for one brick thick wall, one and half brick thick wall for Tee junction.
- Arrangement of bricks using English bond for one brick thick, one and halfand two brick thick square pillars.
- Straightening, cutting, hooking and bending and arrangement of Steel reinforcement bars.

   a. Singly reinforce beam b. Lintel and Sunshade c. Column and footing

Test & Model Exam   **7 Hrs.**

AUTONOMOUS EXAMINATION
SCHEME OF EXAMINATION:

In the examination the students have to be given two experiments one from Part A andanother from Part-B.

DETAILED ALLOCATION OF MARKS

S.No	Description	Part – A	Part – B
1.	Procedure	5	5
2.	Tabulation and Observation	20	25
3.	Calculations	-	20
4.	Sketch / Graph	-	5
5.	Accuracy of result/ Report	10	5
	Viva Voce	5	
	Total	**100**	

LIST OF EQUIPMENTS (for a batch of 30 students):

Sl.No.	List of Equipments Required	Quantity Required
1.	Pegs, thread, cranking tools	As required
2.	Consumables like Bricks, aggregate, paints, Fly ash, polish, steel rods	As required

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F 4305
Term   :   IV
Course Name   :   SURVEYING PRACTICE-II

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
SURVEYING PRACTICE-I	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

The important functions of a civil technician include the jobs of detailed surveying, plotting of survey data, preparation of survey maps and setting out works. While framing the curriculum for the subject of surveying, stress has been given to the Development of the skill in each type of survey like Theodolite surveying, Tachometric Surveying and surveying using Total station that the Civil engineering diploma holder Will normally be called upon to perform.

OBJECTIVE:
- At the end of the course, students will have experiences:
- In handling surveying equipment.
- To do practical exercises in Theodolite surveying.
- To do Tachometric surveying.
- To do surveying using Total station

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F4305 -CO1	Ability to estimate the horizontal angle, distance between two points when their bases are accessible /inaccessible.	**A-4**
1F4305 -CO2	Ability to measure length, included angle, bearing to plot the traverse and elevation of an object when their bases are accessible /inaccessible.	**E-5**
1F4305 -CO3	Ability to determine constants, gradient and elevation of points by tacheometry.	**A-3**
1F4305 -CO4	Ability to measure distance and area to plot traverse/ area of a field by total station.	**E-5**
1F4305 -CO5	Ability to propose road/canal alignment by L.S & C.S, road curve setting by deflection angle, plotting and finding the area of the filed by total station.	**C-6**

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

DETAILED SYLLABUS

LIST OF EXPERIMENTS

PART A: THEODOLITE SURVEYING

1. Study of a Theodolite – Temporary adjustments Reading horizontal angles.
2. Measurement of horizontal angle by:
    i.   Reiteration method (not for Exam) ii. Repetition method (not for Exam)
3. Determination of distance between two points when their bases are accessible, using Theodolite – Measuring Horizontal angles by repetition method and distances from a Theodolite Station.
4. Determination of distance between two points when their bases are inaccessible, using Theodolite – Measuring Horizontal angles by reiteration method from a base line.
5. Measurements of vertical angles to different points.
6. Determination of Elevation of an object when the base is accessible.
7. Determination of Elevation of an object when the base is inaccessible by :
    a) Single plane method   b) Double plane method.

PART B: TACHEOMETRIC SURVEYING

8. Determination of constants of a tachometer.
9. Determination of distance and elevation of points by Stadia tachometry.
10. Determination of gradient between two points (with different elevations) by Stadia tachometry.
11. Determination of distance and elevation of points by Tangential tachometry.

PART C: TOTAL STATION 16 Hrs

12. Study of Total Station General Commands used – Instrument preparation and setting reading distances and angles.
13. Measurement of distances and co-ordinates of given points, using Totalstation.
14. Measurement of altitude of given elevated points, using Total Station.
15. Run closed traverse using Total Station and plotting the traverse.
16. Determination of area of a field / land / College Campus etc. using Total station.

Test & Model Exam 7 Hrs

SURVEY CAMP: (Outside the Campus) Duration: 7 days

The objective of the survey camp is to enable the students to get practical training in the field work. Groups of not more than six members in a group will carry out each exercise in Survey camp. The camp must involve work on a large area of not less than 30 acres outside the campus. At the end of the camp, each student shall have mapped and contoured the area. The camp record shall include all original field observations, calculations and plotting.

20 marks to be allotted for Survey file in the Board Examination for the works carried out by the students in survey camp:

i. L.S and C.S for a road / canal alignment

ii. Radial Tachometric contouring

iii. Contouring by block levels

iv. Curve setting by deflection angle

v. Theodolite / Tacheometric traverse (Balancing the traverse by Bowditch rule)

vi. Total Station (Closed Traverse) – Plotting & Finding the area of the given field.

AUTONOMOUS EXAMINATION

SCHEME OF EXAMINATION:

S.No	Description	Part – A/ B Max. Marks (45)	Part - C Max. Marks (30)
1.	Procedure	5	5
2.	Tabulation and Observation	20	10
3.	Calculations	10	5
4.	Sketch / Graph	5	5
5.	Accuracy of result	5	5
	Total	45	30
	Survey Camp	20	
	Viva Voce	5	
	GRAND TOTAL	**100**	

In the examination the students have to be given two experiments one from Part A orPart B and another from Part-C.

DETAILED ALLOCATION OF MARKS

LIST OF EQUIPMENTS (for a batch of 30 students):

1. Vernier Theodolite   -   6 nos
2. Total Station   -   3 nos

V TERM

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA CIVIL ENGINEERING IN SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name :   DIPLOMA IN CIVIL ENGINEERING
Course Code :   1F5306
Term :   V
Course Name :   STRUCTURAL ENGINEERING
TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Board Examinations	Total		
STRUCTURAL ENGINEERING	6	96	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Reinforced cement concrete structures	18
II	Design of T-beams and lintels for flexure by LSM Design of Continuous Beams for flexure and shear by LSM	17
III	Design of one way Slabs and Stair cases by LSM Design of two way Slabs by LSM	20
IV	Design of columns by LSM Design of Column Footings	16
V	Steel Structures	18
Test & Model Exam		7
Total		**96**

RATIONALE:

Being the basic engineering subject, this imparts basic knowledge and skill regarding properties of materials, concept of stresses and strains, bending moment and shear force diagrams, second moment of area, bending and shear stresses, slope and deflection and analysis of trusses. The above knowledge will be useful for designing simple structural components. This subject is very important to develop basic concepts and principles related to structural mechanics. This subject is much essential for the students to continue their further education.

OBJECTIVES:

At the end of this course, students will be able to

- Design of beam including shear.
- Design of one way slab and two way simply supported slab and continuous slab .
- Design of column and column footing &simple beam in steel structures and Design of compression and tension members in steel structures

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1E5306-CO1	Ability to design of R.C.C beams(Singly and doubly) for flexure by L.S.M.	**C-6**
1E5306-CO2	Ability to develop of R.C.C T-beams for flexure and shear for beams by L.S.M.	**C-6**
1E5306-CO3	Ability to propose of R.C.C one way slab, columns and column footings.	**C-6**
1E5306-CO4	Ability to design of steel structures for simple beams and welded connections.	**C-6**
1E5306-CO5	Ability to design of steel structures for tension and compression members.	**C-6**

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topic	Hours
I	**REINFORCED CEMENT CONCRETE STRUCTURES** **CHAPTER :1.1 INTRODUCTION TO WORKING STRESS AND LIMIT STATE METHOD** Reinforced Cement Concrete- Materials used in R.C.C and their basic requirements – Purpose of providing reinforcement – Different types and grades of cement and steel – Characteristic strength and grades of concrete – Behaviour of R.C members in bending-Modular ratio and Equivalent area of R.C.Sections – Different types of loads on structures as per IS: 875-1987 - Different methods of design. Working Stress Method-Assumptions made in the W.S.M- Singly reinforced rectangular sections – Strain and stress distribution due to bending – Actual and Critical neutral axes – Under / Over reinforced sections- Balanced sections – Lever arm – Moment of resistance of singly reinforced rectangular sections (No problems). Limit State Method – Concept –Advantages- Different limit states-Characteristic strength and design strength of materials – Characteristic loads and design loads - Partial safety factors for loads and material strength - Limit state of collapse in flexure – Assumptions – Stress Strain curves for concrete and steel – Stress block – Maximum strain in concrete – Limiting values of neutral axis of singly reinforced section for different grades of steel -Design stress in tension and compression steel– Moment of resistance of singly and doubly reinforced rectangular sections– Problems. **CHAPTER :1.2 DESIGN OF RECTANGULAR BEAMS FOR FLEXURE BY L.S.M** Design requirements-Effective spans of cantilever and simply supported beams – Breadth and depth requirements of beams – Control of deflection – Minimum depth requirement for stiffness – Minimum concrete cover to reinforcement steel for durability and fire resistance – Minimum and maximum areas/ spacing for main reinforcement and side face reinforcement as per IS 456 -2000 - Development Length-Anchorage values of bends and hooks - Curtailment of reinforcements-Design bending moments – Design of singly and doubly reinforced rectangular beams (Cantilevers and Simply supported beams carrying udl only)- Problems- Practice on using Design Aids, SP16 (Description only).	18
II	**CHAPTER :2.1 DESIGN OF T-BEAMS AND LINTELS FOR FLEXURE BY L.S.M**	17

	Cross sections of Tee and L-beams- Effective width of flange- Neutral Axis and M.R of Singly Reinforced T-Sections- Design of singly reinforced T-beams for flexure–Problems on Simply supported T- beams carrying udl only – Loads on Isolated Lintels over openings of masonry walls - Design B.M for isolated lintels carrying rectangular/triangular loads- Design of Lintel- Simple problems **CHAPTER :2.2 DESIGN OF CONTINUOUS BEAMS FOR FLEXURE AND SHEAR BY L.S.M** Methods of analysis of continuous beams- Effective Span- Arrangement of Loading for Critical Bending Moments- B.M coefficients specified by IS:456-200-Design of rectangular continuous beams (Singly and Doubly Reinforced) using B.M. coefficients (equal spans & u.d.l only) for sagging and hogging moments. Limit state of collapse in shear – Design shear strength of concrete – Design shear strengths of vertical / inclined stirrups and bent up bars –Principle of shear design **–** Critical sections for shear- S.F Coefficients specified by IS:456- 2000– Nominal shear stress –Minimum shear reinforcement- Design of vertical stirrups for rectangular beams using limit state method –Simple problems- Practice on use of Design Aids (Description only).	
III	**CHAPTER :3.1 DESIGN OF ONE WAY SLABS AND STAIRCASES BY L.S.M** Classification of Slabs – Effective spans – Loads (DL and IL) on floor/roof slabs and stairs (IS: 875-1987) – Strength and Stiffness requirements –Minimum and maximum permitted size, spacing and area of main and secondary reinforcements as per IS 456 - 2000- Cover requirement to reinforcements in slabs- Design of cantilever/simply supported one way slabs and sunshades by limit state method – Design of continuous slabs using B.M coefficients- Check for shear and stiffness – Curtailment of tension reinforcement –Anchoring of reinforcement– Practice in designing slabs using design aids (Description only). Types of stairs according to structural behaviour- Requirements of Stairs- Planning a staircase – Effective span of stairs – Effective breadth of flight slab- Distribution of loads on flights – Design of cantilever steps – Design of doglegged stairs spanning parallel to the flight - Planning of open well staircase. **CHAPTER :3.2 DESIGN OF TWO WAY SLABS BY L.S.M** Introduction –Effective spans –Thickness of slab for strength and stiffness requirements - Middle and Edge strips – B.M coefficients as per IS:456 – Design B.Ms for Simply supported, Restrained and Continuous slabs – Tension and Torsion reinforcement requirement– Design of two way slabs using B.M. coefficients – Curtailment of reinforcement –	20
IV	**CHAPTER :4.1 DESIGN OF COLUMNS BY L.S.M** Limit state of collapse in compression – Assumptions - Limiting strength	16

of short axially loaded compression members - Effective length of compression members – Slenderness limits for columns – Classification of columns -Minimum eccentricity for column loads – Longitudinal and Transverse reinforcement requirements as per I S 456-2000 – Cover requirement - Design of axially loaded short columns with lateral ties / helical reinforcement – Practice on use of Design Aids (Description only). **CHAPTER :4.2 DESIGN OF COLUMN FOOTINGS** Basic requirements of Footings-Types of R.C footings –Minimum depth below GL- Footings with uniform thickness and varying thickness (sloped footing) – Critical sections for BM, Transverse/Punching Shears – Minimum reinforcement, Distribution of reinforcement, Development length, Anchorage, Cover, Minimum edge thickness requirements as per IS 456- 2000 – Design of Isolated footing (square and rectangular) with uniform/ varying thickness by limit state method- For Examination : Problem either on (i) Designing Size of Footing and Area of tension steel for flexure only for the given Column load and SBC of soil, or on (ii) Checking the footing for Punching shear and Transverse shear only, for the given sizes and other required details of the footing.	
V	**STEEL STRUCTURES** **CHAPTER :5.1 DESIGN OF TENSION AND COMPRESSION MEMBERS BY L.S.M** General- Characteristic Actions, Partial Safety Factors for Loads, Design Actions- Ultimate Strength, Partial Safety Factors for Materials, Design Strengths of Materials - Rolled Steel Sections - Different forms of Tension members – Gross area, Net area and Net Effective sectional area of Tension members– Maximum permitted values of Effective Slenderness Ratio –Design Strength of single angle Tension members against Yielding of Gross section and Rupture of Critical section - Block Shear (Description only) - Design of ties using single angles and channel sections. Different forms of Compression members- Classification of Cross sections- Limiting Width to Thickness Ratio- Effective sectional area-End Conditions and Effective length of Compression members – Maximum permitted values of Slenderness ratio – Imperfection factor and Stress reduction factor– Design Strength of Compression members- Problems –– Design of single angle and double angle Struts – Design of steel columns using rolled steel sections (Symmetrical sections only) without cover plates. (Lacing and battens not included). **CHAPTER :5.2 DESIGN OF SIMPLE BEAMS AND WELDED CONNECTIONS BY L.S.M** Classification of Steel beams –Effective span- Design principles-Minimum thickness of Web-Design Strength in Bending/ Shear- Limiting deflection of beams - Lateral buckling of beams – Maximum permitted	**18**

Slenderness Ratio- Plastic Moment of Resistance and Plastic Section Modulus of Sections- Shape Factor — Design of laterally supported Simple beams using single / double rolled steel sections (symmetrical cross sections only) (Built-up beams not included).

Types of welds – Size, Effective area and Effective length of Fillet welds – Requirements of welds-Stresses in Welds –Design strength of fillet/ butt welds -– Lap and butt joints for angles only – Simple Problems - Procedure for design of welded connections for Plates and Angles (Theory only).

Text Books:

Sl.No.	Title	Author	Publisher
1.	Reinforced Concrete - (2009)	S. Unni Krishnan Pillai&Devadas,	Tata McGraw Hill Publishing Co. Ltd.

Reference Books

Sl.No.	Title	Author	Publisher
1.	RCC Theory and Design - (1972)	M.G.Shah& C.M. Kale,	Macmillan Publishers India Ltd.
2.	Design of Reinforced Structures - (2011)	P.C. Varghese	Prentice Hall of India
3.	Design of Reinforced Structures - (2011)	P.C. Varghese,	Prentice Hall of India
4.	Design of reinforced cement concrete structures	N.Krishna Raju	CBS Publishers & Distributors

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented to the students Admitted from the year 2020-2021 onwards)

Course Name	:	DIPLOMA IN CIVIL ENGINEERING
Subject Code	:	1F5307
Semester	:	V Semester
Subject Title	:	ENVIRONMENTAL ENGINEERING

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Board Examination	Total		
ENVIRONMENTAL ENGINERING	5 Hrs.	80 Hrs.	25	100*	100		3 Hrs.

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topics	Hrs
I	Water Supply Engineering: Introduction, Quantity of Water, Source of Water, Intakes and conveyance	15
II	Quality of Water, Primary treatment of water, Filtration of water, Disinfection of water and water softening.	15
III	Distribution system and preparation of water supply scheme or	15
IV	Sanitary Engineering: Collection and conveyance of sewage, Seaware appurtenances.	14
V	Primary Treatment of water, Secondary treatment of water, solid waste disposal, sludge waste disposal and preparation of sanitary scheme or	14
	Test & Model Exam	7
	Total	**80**

RATIONALE:

Diploma holders in Civil Engineering are expected to supervise construction of water supply and waste water treatment works. They are also responsible for waste disposal activities. This subject aims at imparting skills for preparing water supply and waste water engineering drawings to develop competencies for reading the drawings, and their execution in their field. In addition, Civil Engineering diploma holders must have the knowledge of different types of environmental aspects due to development activities so that they may help in maintaining the ecological balance and control pollution. They should also be aware of the environmental laws for effectively combating environmental pollution.

OBJECTIVES:

On completion of the course, the student will be able to:

- Know the procedure of estimating water requirements for a water supplyscheme.
- Select suitable sources of water supply and pipe materials.
- Determine the quality of water, testing procedures and standards fordrinking water.
- Understand the methods of purification of water.
- Understand the systems of distribution for a water supply scheme.
- Understand the basic facts of sanitary engineering, the methods ofcollection and conveyance of sewage.
- Understand the primary and secondary treatment of sewage and disposal.
- Know the methods of disposal of sludge and solid wastes.
- Identify the various types of pollution and their prevention.
- Create awareness about environmental impact assessment.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5307-CO1	Ability to evaluate Water Supply Engineering, Intakes and conveyance	**A-4**
1F5307-CO2	Ability to estimate. Primary treatment of water, Filtration of water,Disinfection of water and water softening.	**U-2**
1F5307-CO3	Ability to Illustrate Distribution system and preparation of water supply scheme orproject.	**A-2**
1F5307-CO4	Ability to Understand Collection and conveyance of sewage,Seaware appurtenances.	**U-2**
1F5307-CO5	Ability to Understand Treatment of water, Secondary treatment of water, solid waste disposal,	**U-2**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**PART I - WATER SUPPLY ENGINEERING** **CHAPTER:1.1 INTRODUCTION** Water Supply – Salient Features of a Water Supply Scheme –Flow Chart of a Water Supply Scheme- Agencies responsible for protected water supply.	**3**
	CHAPTER:1.2 QUANTITY OF WATER Water Supply - Need for Protected Water Supply - Objectives of Public Water Supply System Demand - Types of Demand - Per Capita Demand - Prediction of Population - Problems in Arithmetical Increase Method, Geometrical Increase Method, Incremental Increase Method.	**4**
	CHAPTER:1.3 SOURCES OF WATER Sources of Water – Surface Sources – Underground Water Sources- Selection of Source of Water.	**3**
	CHAPTER:1.4 INTAKES AND CONVEYANCE Intakes - Types of Intakes - Description of Intakes -Infiltration Galleries and Infiltration Wells in River Beds - Pipes for Conveyance of Water - Cast Iron, Steel, G.I., Cement Concrete, R.C.C., Hume and PVC Pipes - Pipe Joints - Laying and Testing of Pipe Lines.	**5**
II	**CHAPTER:2.1 QUALITY OF WATER** Impurities in Water - Testing of Water - Collection of Water Sample - Physical, Chemical, Bacteriological Tests - Standards of Drinking Water - Water Borne Diseases and their Causes.	**3**
	CHAPTER:2.2 PRIMARY TREATMENT OF WATER Object of Water Treatment — Flow Diagram of a Treatment Plant — Function of Units – Sedimentation – Purpose of Sedimentation – Types of Sedimentation Tank — Coagulation — Coagulants — Flocculation — Coagulation Process.	**5**
	CHAPTER:2.3 FILTRATION OF WATER Theory of Filtration – Classification of Filters – Slow Sand Filter – Rapid Sand Filter – Pressure Filter - Comparison between slow sand filter andrapid sand filter.	**3**
	CHAPTER:2.4 DISINFECTION OF WATER AND WATER SOFTENING Necessity of Disinfection – Methods of Disinfection – Chlorination –Action of Chlorine — Methods of Chlorine — Forms of Chlorination –Water Softening — Necessity of Water Softening — Hardness — Types of Hardness – Effects of Hardness – Removal of Hardness (names only) - Miscellaneous Water treatment (names only) — Mineral water — requirements – Treatment Process – Reverse of Osmosis (RO).	**4**

III	**CHAPTER:3.1 DISTRIBUTION SYSTEM** Distribution System - Methods of Distribution Gravity System, Pumping System, Combined System - Systems of Water Supply - Continuous and Intermittent Supply of Water -Layouts of Distribution - Dead End, Grid Iron, Radial and Circular Systems — Service Reservoirs - Types.	**7**
	CHAPTER:3.2 PREPARATION OF WATER SUPPLY SCHEME OR PROJECT Reconnaissance of Survey — Demand of Water — Source of Water —Preparation of Topographical Map – Layout Map of the Scheme – Mapand Drawing to be Prepared – Office Work – Project Report.	**8**
IV	**PART II – SANITARY ENGINEERING** **CHAPTER:4.1 COLLECTION AND CONVEYANCE OF SEWAGE** Sanitation Purpose Terms - Systems of Sanitation - Quantity of Sewage - Variation in Rate of Flow of Sewage -Estimation of strom water - problems - Minimum Size of Sewer — Shapes of Sewer (names only) - Materials used for Sewer - Joints in Sewer Line - Laying and Testing of Sewer Lines — Ventilation of Sewers - Cleaning of Sewers.	**7**
	CHAPTER:4.2 SEWER APPURTENANCES Sewer Appurtenances Manhole - Lamp Hole - Catch Basin - Street - Inlet - Grease and Oil Trap - Flushing Tanks Drainage Arrangements in Buildings - Sanitary Fittings - Sewage Pumps Necessity - Types ofSewage Pumps (names only).	**7**
V	**CHAPTER:5.1 PRIMARY TREATMENT OF SEWAGE:** Introduction – Flow diagram of primary treatment-screens-Grit chambers-skimming tank-Primary sedimentation tank.	**3**
	CHAPTER:5.2 SECONDARY TREATMENT OF SEWAGE: Introduction-Flow diagram of secondary treatment-Function of units of secondary treatment-secondary sedimentation tank-filters-types-Trickling filters-activated sludge process-septic tanks for isolated buildings-construction and working of septic tanks-soak pits-dispersion trenches.	**3**
	CHAPTER:5.3 ENVIRONMENTAL POLLUTION AND SOLID WASTE DISPOSAL: Environment –definition-water pollution-sources of water pollution-effects of water pollution-control of water pollution-soil pollution-sources of soil pollution-effects of soil pollution-Control of soil pollution-Noise pollution-Source of noise pollution-effects of noise pollution-control of noise pollution-air pollution-sources of air pollution – effects of air pollution on human beings, plants, animals, materials-air pollution-control equipment-control devices for particulate contaminants-environmental degradation-ozone layer depletion-solid waste disposal-Necessity-Method of solid waste disposal-dumping-sanitary landfill, composting-energy from waste-A study on construction and demolition waste.	**5**

	CHAPTER:5.4 ENVIRONMENTAL IMPACT ASSESSMENT: Environmental impact assessment (EIA)-Methodology of EIA-Organizing the job.-performing the assessment –preparation of environmental impact statement(EIS)-Review OF EIS-environmental risk assessment-limitation of EIA.	3

Text Books:

SI.No.	Title	Author	Publisher
1.	Environmental Engineering - (2003)	N.N.Basak,	Tata McGraw Hill Pub. Co., New Delhi

Reference Book:

SI.No.	Title	Author	Publisher
1.	Water Supply and Sanitary Engg.(Volume –I&II)- (2006)	Gurcharansingh,	Standard publishers and distributors, Delhi
2.	Principles of environmental science and engineering - (2010)	P.Venugopala Rao	PHI learning PVT Ltd, New Delhi

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY(Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F5308.1
Term : V
Course Name : REMOTE SENSING AND GEOINFORMATICS

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Board Examinations	Total		
REMOTE SENSING AND GEOINFORMATICS	5	80	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Fundamentals of Remote Sensing	15
II	Photogrammetry	15
III	Image Interpretation and Analysis	15
IV	Fundamentals of GIS	14
V	GIS - Data entry, Storage and Analysis	14
	Test & Model Exam	7
	Total	**80**

RATIONALE:

In civil engineering projects, RS and GIS techniques can become potential and Indispensable tools. Various civil engineering application areas include regional planning and site investigation, terrain mapping and analysis, water resources engineering, town planning and urban infrastructure development, transportation network analysis,landslide analysis, etc.

OBJECTIVES:

On completion of the course, the students will be able to:

- Understand the basic concepts of remote sensing.
- Know the applications of Geographic information systems in Civil Engineering.
- Identify the basic remote sensing concepts and its characteristics.
- Implement the photogrammetric concepts and fundamentals of Air photo.
- Interpretation Use various analysis and interpretation of GIS results

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5308.1-CO1	Ability to identify the fundamentals of remote sensing	**U-2**
1F5308.1-CO2	Ability to determine the earth view by the photogrammetric surveying	**A-3**
1F5308.1-CO3	Ability to analyze the image interpretation through photos	**A-4**
1F5308.1-CO4	Ability to summarize the components, features of GIS	**E-5**
1F5308.1-CO5	Ability to prepare maps for the interpretation the data	**C-6**

- **Legends:** R = Remember U= Understand; A= Apply and above levels (BTL-Bloom's revised taxonomy Level

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**CHAPTER:1 FUNDAMENTALS OF REMOTE SENSING** Basics of Remote Sensing: Definitions and its components – Energy Sources and Radiation principles – electromagnetic radiation (EMR) – spectrum – wavelength regions important to remote sensing – Atmospheric scattering, absorption – Atmospheric windows – spectral signature concepts – typical spectral reflective characteristics of water, Vegetation and soil. characteristic of real remote sensing system, platforms, orbit types, sensors, resolution concept satellite,-Pay load description of important Indian Earth Resources and Meteorological Satellites.	15
II	**CHAPTER:2 PHOTOGRAMMETRY** Geometric elements of a vertical photograph – Stereoscopic plotting	15

	instruments, Ortho photos, Flight planning	
III	**CHAPTER :3 IMAGE INTERPRETATION AND ANALYSIS** Fundamentals of Air-photo interpretation - Elements of image interpretation, concepts of digital image processing image Rectification and Restoration, Image enhancement, Image classification, Application of Remote sensing in Civil Engineering.	15
IV	**CHAPTER : 4 FUNDAMENTALS OF GIS** Basic Concepts of GIS – Basic spatial concepts –Coordinate Systems: Definitions - History of development of GIS - Components of GIS: Hardware, Software, Data, People and Methods – Proprietary and open source Software - Types of data – Spatial, Attribute data types of attributes – scales/ levels of measurements -Data Base Management Systems.	14
V	**CHAPTER :5 GIS - DATA ENTRY, STORAGE AND ANALYSIS** Data models - Vector and raster data – data compression – data input by digitization and scanning, data storage – attribute data analysis – integrated data analysis- mapping concept - development of map Overlay, overlay operation - Errors and quality control. Land Information System (LIS)– Various GIS applications in Civil Engineering-Regional Planning and Site investigations, Hydrology and Water Resources Engineering, Transportation network analysis - Highway Alignments.	14
	Test & Model Exam	7hrs

Reference Books

Sl.No	Title	Author	Publisher
1.	Geographic Information Systems	Lo & Yeung (2005),	Prentice of India
2.	Remote Sensing and Geographical information systems	Anji Reddy.M. (1998)	Hyderabad: BS Publications, 2008.
3.	Remote Sensing and image interpretation	Lillesand, T.M. & Kiefer R.W. (1998)	John Wiley & Sons, Newyork
4.	Principle of Geographical Information Systems for land resources assessment	Burrough P.A. (2000),	Clarendon Press, Oxford.
5.	Graphic Information Systems &Environmental Modeling	Clarke Parks & Crane (2005)	Prentice-Hall of India
6.	Elements of photogrammetric	Wolf Paul (1998)	McGraw Hill, New Delhi
7.	Basics	Shahab Fazal	New Age International Publications, Chennai

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F5308.2
Term   :   V
Course Name   :   **CONCRETE TECHNOLOGY**

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
CONCRETE TECHNOLOGY	5	80	25	100*	100	3 Hrs.

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hour

Unit	Topics	Hours
I	Concrete: Introduction, Cement, Aggregates and water	15
II	Admixtures , Mix Design for Concrete	15
III	Special Concrete, Pre-stressed Concrete	15
IV	Light Weight Concrete, Formwork	14
V	Cracks in Concrete Structure and their Prevention,	14
	Test & Model Exam	7
	Total	**80**

RATIONALE:

A diploma student in Civil Engineering requires to know more about the concrete, which is one of the most important construction materials. This subject aims to improve the knowledge in the mix design and special types of concrete, to have the exposure of cracksin concrete structure and repairing, etc

OBJECTIVES:

On completion of this course, the students will be able to:

- Materials used.
- Admixtures used in concrete.
- Mix design method.
- Special and prestressed concrete.
- Forms works.
- Cracks and maintenance of concrete.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5308.2 -CO1	Ability to explain the Properties of Concrete, Production of Concrete and their Types of Concrete.	A-4
1F5308.2 -CO1	Ability to summarize the admixtures and mix design of concrete.	U-2
1F5308.2 -CO1	Ability to describe the special type of concrete and its types and light weight concrete.	U-2
1F5308.2 -CO1	Ability to illustrate the prestressed concrete, form work and its applications.	U-2
1F5308.2 -CO1	Ability to explain the Cracks in Concrete Structure and their Prevention Joints, Repairs and Maintenance of Concrete	A-4

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**CHAPTER :1.1 CONCRETE** **Introduction** of Concrete Technology and Concrete – Ingredients of Concrete. **Cement:** Composition of Cement – Function of Cement Ingredients – Types of Cements (Names Only)- OPC cement-Grades of cement as per BIS:269-2015-- Physical requirements for OPC cement – Uses of Cement. **Aggregates:** Fine Aggregate – Natural sand, Crushed sand Manufactured sand(RCA and RA),and Mixed sand – Types of Sand based on the purpose of use – Types of sand based on the Grain size – Properties of good Sand. Coarse Aggregates ─ Functions	15

	— Properties — Requirements – Classification of Aggregates Extent of utilization of Manufactured Coarse and fine aggregates as per IS:383-2016-. **Water** – Functions – Water for Curing of Concrete. Properties of Concrete – Production of Concrete – Types of Concrete and its uses – Test on Concrete (Names only).	
II	**CHAPTER :2.1 ADMIXTURES** Definition – Functions of Admixtures – Classification of Admixtures: Accelerating admixtures — Retarding admixtures — Grouting admixtures – Air entraining admixtures – Pozzolanic or mineral admixtures Limits of addition of performance improvers as per BIS:269-2015- — Air entraining admixtures — Plasticizers — Super plasticizers.	7
	CHAPTER :2.2 Mix Design for Concrete Mix design – purpose of Mix design – object of Mix design – Factors affecting the choice of Mix design – variables in proportioning – Mix design methods – Mix design procedure I.S. Code method – Mix proportions for weigh batching and volume batching.	8
III	**CHAPTER :3.1 Special Concrete** Polymer concrete – Fiber reinforced concrete – Light weight concrete – Shot crete or guniting concrete (Applications and Advantages) **CHAPTER :3.2 Light Weight Concrete** Classification of light weight concrete – Characteristics of light weight concrete – Applications of light concrete - Advantages of light weight concrete. **CHAPTER :3.3 Self compacting concrete** Materials for SCC--Methods of preparation-List of test methods for Workability properties-Advantages	7 8
IV	**CHAPTER :4.1 Pre-stressed concrete** General principle of stressing — advantages of pre stressed — Concrete – Need for High strength steel and concrete- terminology – tendon – anchorage – pre tensioning-post tensioning – bonded pre stressed concrete – non bonded pre stressed concrete – methods of pre stressing – pretension method – post tension method – system of pre stressing – freyssinet system – Magnet blaton system – Lee-mc - call system – application of pre stressing elements – causes for losses in pre stress and remedial measures.	10
	CHAPTER :4.2 Formwork Requirements of formwork – materials used for formwork –cleaning and treatments of forms - points to be kept in mind before placing concrete in form work.	4

V	**5.1 Cracks in Concrete Structure and their Prevention** Cracks in concrete structures – assessment of cracks – types of cracking – preventive measures.	**6**
	5.2 Joints, Repairs and Maintenance of Concrete Types of joints – construction joints – contraction joints – expansion joints – isolation joints – methods of repairing concrete works.	**8**
	Test & Model Exam	**7hrs**

Reference Books:

Sl.No	Title	Author	Publisher
1.	Concrete Technology (Theory and Practice)	M.S.SHETTY	S.CHAND & Compan Pvt. Ltd. New Delhi.
2.	Concrete Technology	M L GAMBHIR	TATA McGraw-Hill Publishing Company Limited, New Delhi
3.	Concrete Technology	Vineet Kumar (Edited)	Khanna Publishers, New Delhi
4.	Concrete Technology	A.R.Santhakumar	Oxford University press
5.	Concrete Technology	A.M. Neville	Pearson Education

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F5308.3
Term   :   V
Course Name   :   GEOTECHNICAL ENGINEERING

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
GEOTECHNICAL ENGINEERING	5	80	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks

Topics and Allocation of Hours

UNIT	TOPIC	Hrs
I	Index properties and Hydraulic Properties of Soil	15
II	Classification and Strength of Soil, Stabilization of Soil and Sub-soil Sampling	15
III	Seepage Analysis and Seepage below Hydraulic Structures, Bearing Capacity and Settlement of foundations	15
IV	Foundations and Foundations in Expansive Soil	14
V	Machine Foundation and Foundations of Transmission Line Towers	14
	TOTAL	**80**

RATIONALE:

     Civil Engineering diploma engineers are required to supervise the construction of roads and pavements, dams, embankments, and other Civil Engineering structures. As such, theknowledge of basic soil engineering is a pre-requisite for these engineers for effective discharge of their duties. This necessitates the introduction of Soil Engineering

subject inthe curriculum for Diploma Course in Civil Engineering. The subject covers only such topics as will enable the diploma engineers to identify and classify the different types of soils, their selection and proper use in the field for various types of engineering structures. The emphasis will be more on teaching practical aspects rather than theoretical concepts.

OBJECTIVES:

On completion of the course, the students will be able to:

- Learn the Properties of Soil, Classification and Strength of soils.
- Describe the Sub-soil Sampling.
- Understand the Seepage analysis, Bearing Capacity of soil and Settlement of Foundations.
- Learn the types of Foundations, Pile foundations and Pile Groups.
- Understand the Foundations on Expansive soil and Machine Foundations.
- Know about the Foundations of Transmission Line Towers

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5308.3-CO1	Ability to evaluate the soil mechanics & Hydraulic properties of soil	**A-4**
1F5308.3-CO2	Ability to Illustrate the classification and strength of soil , stabilization of soil and sub soil sampling.	**A-3**
1F5308.3-CO3	Ability to Analyze the seepage and seepage below hydraulic structures , bearing capacity and settlement of foundations	**A-4**
1F5308.3-CO4	Ability to understand foundation and foundations in expansive of soil	**U-2**
1F5308.3-CO5	Ability to understand Machine foundation and tower foundations	**U-2**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**GEOTECHNICAL ENGINEERING:** **CHAPTER:1.1 Soil Mechanics and Index Properties** Introduction - Development of Soil Mechanics - Fields of application of Soil Mechanics - Soil formation - Cohesive and Cohesion less soil - Soil Properties -Three phase system - General, Index and Engineering properties - Detailed description - Atter Berg"s limits - Simple problems - Soil map of India.	10
	CHAPTER:1.2 Hydraulic Properties of Soil : Introduction - Permeability - Co-efficient of permeability - Darcy"s law - Factors affecting permeability - Permeability tests - Simple problems - Quick sand conditions.	5
II	**CLASSIFICATION AND STRENGTH OF SOIL, STABILIZATION OF SOIL AND SUB-SOIL SAMPLING** **CHAPTER: 2.1 Classification and Strength of Soil** Classification of soil-Introduction -Necessity-Systems of soil classification - Field identification of soil - Shear strength of soil - Introduction - Shear strength - Mohr"s stress circle - Mohr- Coulomb failure theory - Shear strength test - Unconfined compression test - Mohr"s circle for unconfined compression test-Compaction Consolidation- Consolidometer - Optimum moisture content - Proctor"s Compaction test - Methods of compaction - Degree of compaction - Field density of soil -Tests - Compaction and Consolidation - Comparison.	8
	CHAPTER: 2.2 Stabilization of Soil and Sub-Soil Sampling : Stabilization of soil - Introduction - Objects of stabilization - Methods ofstabilization - Soil exploration - Introduction - Objects of soil exploration -Methods of soil exploration - Direct , Semi-direct and Indirect methods -Spacing and depth of test borings - Boring log - Sounding and Penetration tests-Standard Penetration Test(SPT)-Geophysical methods - Sub-soil Sampling - Disturbed and Undisturbed samples - Types of samplers – Split spoon sampler - Thin-walled sampler - Chunk sampling.	7
III	**SEEPAGE ANALYSIS AND SEEPAGE BELOW HYDRAULIC STRUCTURES, BEARING CAPACITY AND SETTLEMENT OF FOUNDATIONS** **CHAPTER: 3.1 Seepage Analysis and Seepage Below Hydraulic Structures :** Seepage analysis - Introduction - Head , Gradient and Potential - Hydraulic gradient - Seepage pressure - Upward flow (Quick condition or Quick sand) - Types of flow lines - Types of flow	7

	(Definition only) - Two dimensional flow (Laplace equation) - Velocity potential -Properties of flow net - Uses of flow net - Seepage below Hydraulic structures - Introduction - Hydraulic gradient - Piping - Exit gradient - Khosla"s theory - Seepage flow nets below hydraulic structures.	8
	CHAPTER: 3.2 Bearing Capacity and Settlement of Foundations : Bearing capacity - Introduction - Terminology - Factors affecting bearing capacity of soils - Methods of determining bearing capacity - Types of failure in soil - General , Local and Punching shear failure - Analytical methods - Rankine"s analysis - Terzaghi"s analysis - Assumption and limitations - Effect of water table - Methods of improving bearing capacity of soil –Bearing capacity of different soil as per IS Settlement of foundation - Introduction - Causes and Effect of settlement – settlement values as per BIS provisions Plate load test - Simple problems.	
IV	**FOUNDATIONS AND FOUNDATIONS IN EXPANSIVE SOIL** **CHAPTER: 4. 1 Foundations :** Introduction - Definitions - Objectives - Requirements of foundation - Criteria for selection of type of foundation - Types of foundations - Shallow foundation types-isolated, combined ,raft Deep foundations - Types - Foundation at different levels - Foundation on made up grounds - Deep foundation - Introduction - Pile foundation - Uses of piles - Types of piles - Caisson foundation - Types - Selection of piles - Pile Driving - Capacity of piles - Pile load test - Floating foundation - Negative skin friction - Pile groups - Bearing capacity of pile groups - BIS provision for Settlement of pile group – Design of foundation using software (Description only)	8
	CHAPTER: 4.2 Foundations In Expansive Soil : Introduction - Identification of expansive soil - Free Swell Test - Differential free swell test - Indian expansive soil - Swell potential and Swelling pressure - Traditional Indian practice - Methods of foundation in expansive soils - Replacement of soils and "CNS" concept - Under reamed pile foundation - Remedial measures for cracked buildings.	6
V	**MACHINE FOUNDATION AND TOWER FOUNDATIONS (TRANSMISSION LINE)** **CHAPTER: 5.1 Machine Foundation :** Introduction - Soil dynamics - Free vibration and Forced vibration - Definitions -Natural frequency - Barkan"s method Pauw"s method - Types of machines and machine foundation - General requirements - Design of machine foundations - Reciprocating type - Centrifugal type - Impact type - design steps- Couzen theory - In-situ dynamic investigation of soil - Methods - IS code of practice - Design criteria -	9

	Isolation of foundation - Simple problems. **CHAPTER: 5.2 Foundations of Transmission Line Towers** Introduction - Necessity - Forces on Tower Foundations - General design criteria - Choice and type of foundations - Design procedures - Stability conditions – Description only	5

Reference Book:

Sl.No.	Title	Author	Publisher
1.	Soil Mechanics and Foundation Engineering	Dr.K.R.Arora	Standard pubulishers Distributers1705b Nai sarak,Delhi-110003
2.	Design Aids in Soil Mechanics and Foundation Engineering	Shenbaga R Kaniraj, IIT Delhi	TATA McGRAW-HILL , Publishing Company ltd. New Delhi
3.	Soil Mechanics and Foundation Engineering	V.N.S.Moorthy	Book World Enterprises
4.	Soil Mechanics and Foundation Engineering	B.C.Punmia	Laxmi Publications

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name   :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F5402
Term   :   V
Course Name   :   CIVIL ENGINEERING DRAWING AND CAD PRACTICAL – II

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
CIVIL ENGINEERING DRAWING AND CAD PRACTICAL	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 mark
RATIONALE:
   Computers play a very vital role in present day life, more so, in all the professional life of engineering. In order to enable the students to use the computers effectively in drafting, this course offers Computer Aided Drafting of various drawings in Public Health Engineering, Bridge Engineering and Structural Engineering.

OBJECTIVES:
On completion of the course, the students will be able to:
- Prepare Public Health Engineering drawings manually
- Know about RCC and Steel bridge structures and draw manually
- Draw the Structural Engineering drawings using CAD,

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5402-CO1	Ability to understand Rapid Sand Filter, Septic Tank with dispersion Trench / Soak pit, R.C.C square overhead tank supported by four columns.	**U-2**
1F5402-CO2	Ability to create Steel Foot over bridge across a highway, Two span Tee Beam Bridge with square returns	**U-2**
1F5402-CO3	Ability to create Structural drawings using CADD.	**A-4**
1F5402-CO4	Ability to create Structural drawings using CADD.	**C-6**
1F5402-CO5	Ability to create Structural drawings using CADD.	**C-6**

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

DETAILED SYLLABUS
LIST OF EXPERIMENTS

PREPARATION OF DRAWINGS MANUALLY (Part I and II) AND USING CAD SOFTWARE (Part III)

I. PUBLIC HEALTH ENGINEERIN 20 Hours

Draw plan and sectional views of the following:
- Rapid Sand Filter.
- Septic Tank with dispersion Trench / Soak pit.
- R.C.C square overhead tank supported by four columns

II. BRIDGE DRAWING 12 Hours

Draw plan and sectional views of the following:
- Steel Foot over bridge across a highway.
- Two span Tee Beam Bridge with square returns

III. STRUCTURAL ENGINEERING 57 Hours

Draw plan, cross section and longitudinal section
- Continuous one-way slab (with three equal spans).
- Simply supported two-way slab.
- Restrained two-way slab.
- Singly reinforced rectangular beam.
- Doubly reinforced Continuous beam (Rectangular beam with two spans).
- Tee Beams supporting continuous slab.
- Lintel and Sunshade.
- Dog-legged staircase.
- R.C.C. Column with square isolated footings.
-

AUTONOMOUS EXAMINATION

DETAILED ALLOCATION OF MARKS:

PART -& II	Manual Drawing	20Marks
	Section/Elevation	25 Marks
PART -& II	Plan/Elevation	25 Marks
	Plan/Cross section/Longitudinal section	25 Marks
	Viva voce	5 Marks
	Total	**100Marks**

Note:

- For all the drawings, detailed specifications shall be given. Designs are not to be included in the examinations. The drawings must include Layout plans, full plan, sections, etc., as applicable to each topic.

- For all the drawings, detailed specifications shall be given and students should draw in the drawing sheet based on the given specifications. The drawings to be drawn using computer and CAD Software.

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No.	List of the Equipments	Quantity Required
1.	Computers	30 Nos.
2.	Laser printer	3 Nos.
3.	CAD software	30 Users

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F5309
Term : V
Course Name : ENVIRONMENTAL ENGINEERING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
ENVIRONMENTAL ENGINEERING LABORATORY	3	48	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

Diploma holders in Civil Engineering are expected to supervise construction of water supply and waste water treatment works. They are also responsible for waste disposal activities. This subject aims at imparting practical skills for testing of raw water, waste water and to study pollution control equipments to develop competencies for execution in their field.

OBJECTIVES:

On completion of the course, the student will be able to:
- Determine the quality of water, testing procedures and standards fordrinking water.
- Understand the Cutting, threading and joining of G.I.Pipes / cutting andpasting of PVC pipes using solvents.
- Make suction and delivery pipe connections to a centrifugal pump (makingindents, drawing a neat sketch of the connection with details).

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5309 -CO1	Ability to Experiment the optimum coagulant value, Electrometric method, Dissolved oxygen	**A-4**
1F5309 -CO2	Ability to Determine suspended solids dissolved solids, Temporary and permanent hardness.	**A-3**
1F5309-CO3	Ability to make suction , delivery, cutting threading and joining of GI pipes	**A-4**
1F5309-CO4	Ability to Demonstrate pipe fitting and air pollution equipments	**E-5**
1F5309-CO5	Ability to prepare field report for water treatment and sewage treatment plant.	**U-2**

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

ENVIRONMENTAL ENGINEERING LABORATORY

Contents: Practical

Unit	Name of the Topics	Hours
PART A	Collection of water samples from sources and "Estimation of Sulphate content" in water sample. Determination of pH value by Electrometric method using pH meter/ Calorimetric method and comparison by paper method. Determine the optimum dose of coagulant in a given raw water sample by jar test. Determine the dissolved oxygen in the given sample of water. Determination of suspended solids and dissolved solids present in the given sample of water / waste water. Determination of "Temporary and permanent Hardness" present in the given sample of water by EDTA titration method. Estimation of chlorides in the given sample of water by silver Nitrate titration method. Prepare a report of a field visit to water treatment plant.	**18 Hrs.**

PART B	Study of pipe fitting used in water supply (with actual models displayed on board). Study of sanitary wares (with actual models displayed on board). Cutting, threading and joining of G.I.Pipes / cutting and pasting of PVC pipes using solvents. Making a bathroom connection from an existing water supply main (making indents, drawing a neat sketch of the connection with details). Making suction and delivery pipe connections to a centrifugal pump (making indents, drawing a neat sketch of the connection with details). Study of air pollution control equipments (Gravity settling chamber, Cyclone filter with models/devices). Prepare a report of a field visit to sewage treatment plant.	23 Hrs.
	Test & Model Exam		7 Hrs.
	Total		48 Hrs.

AUTONOMOUS EXAMINATION
SCHEME OF VALUATION

In the examination the students have to be given two experiments one from Part A and another from Part-B

ALLOCATION OF MARKS

S.No	Description	Part - A Max. Marks (50)	Part - B Max. Marks(45)
1.	Procedure	5	5
2.	Tabulation and Observation/ Execution	25	30
3.	Calculations	10	
4.	Sketch / Graph	5	5
5.	Accuracy of result/ Finish	5	5
	Viva Voce	5	
	Total	100	

LIST OF EQUIPMENTS(for a batch of 30 students):

S. No	Name of the equipment	Numbers required
1.	pH meter	2 nos
2.	Spectrophotometer	1 no.

3.	Magnetic stirrer	1 no.
4.	Magnetic stirring device	1 set
5.	Turbidmeter	1 no.
6.	Dissolved oxygen meter	1 no.
7.	Drying oven	1 no.
8.	Analytical balance	1 no
9.	Dessicator	1 no.
10.	Dish tongs	1 no.
11.	Evaporating dish	1 no.
12.	Filter membrane	1 no.
13.	Vacuum pump	1 no.
14.	Crucible	1 no.
15.	Whattman filter paper	Required no.
16.	Wash bottle	2 nos.
17.	Pipette, Burette, Funnel, Conical flask, Beaker,	As required

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name   :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F5310.1
Term   :   V
Course Name   :   ADVANCED SURVEYING AND BASIC GIS PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
ADVANCED SURVEYING AND BASIC GIS PRACTICAL	3	48	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

This is an applied subject in Civil Engineering for learning Advanced Surveying and Basic GIS Practical. Diploma holders in Civil Engineering are expected to survey the construction features and this course aims to teach about Surveying using Remote Sensing and GIS applications.

OBJECTIVES:
- On the Completion of the course the students will be able to:
- Acquire practical knowledge in the use of Arc GIS and Arc Map.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5310.1 -CO1	Ability to demonstrate remote sensing and ARC GIS.	**A-3**
1F5310.1-CO2	Ability to create an image using ARC GIS.	**C-6**
1F5310.1 -CO3	Ability to editorialize the shape of the files in ARC Map	**E-5**
1F5310.1-CO4	Ability to prepare the data, buffering, clipping and adding fields to a shape files	**A-3**
1F5310.1 -CO5	Ability to discover a campus map using Arc GIS software	**A-3**

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

DETAILED SYLLABUS

Remote Sensing Exercises:		
1.	Introduction to Remote Sensing and GIS and creating a map using tools	5
2.	Introduction to ARC GIS Desktop.	5
3.	Geo referencing an image using ARC GIS.	5
4.	Creating and editing Shape files in ARC MAP.	5
5.	Editing in ARC MAP.	5
6.	Adding fields to a Shape file.	4
7.	Querying the data.	4
8.	Buffering and Clipping.	4
9.	Case study of creation of campus map using Arc GIS software	4
	Test & Model Exam	**7**
	Total	**48**

AUTONOMOUS EXAMINATION
SCHEME OF VALUATION
ALLOCATION OF MARKS

DETAILED ALLOCATION OF MARKS

S.No	Description	Max.Marks(100)
1.	Procedure	10
2.	Tabulation and Observation	40
3.	Calculations	25
4.	Sketch / Graph	10

5.	Accuracy of result	10
	Viva Voce	5
	Total	**100**

LIST OF EQUIPMENTS (for a batch of 30 students):

S. no	Name of the equipment	Numbers required
1.	Arc GIS software	No of users as per requirement
2.	Arc Map Software	No of users as per requirement

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code   : 1F5310.2
Term   : V
Course Name   : CONCRETE TECHNOLOGY PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
CONCRETE TECHNOLOGY PRACTICAL	**3 Hrs.**	**48 Hrs.**	**25**	**100***	**100**	**3 Hrs.**

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks

RATIONALE:

Diploma holders in Civil Engineering are supposed to supervise the construction of buildings. To perform the above task, it is essential that students should have knowledge of various sub components of buildings like foundations, walls, roofs, stair cases, floors etc., and their constructional details. Therefore, the subject of concrete technology practical is very important for Civil Engineering diploma holders

OBJECTIVES:

On completion of the course, the student will be able to:
- Find the fineness setting time of cement.
- Know the shape tests and fineness for modulus coarse aggregate.
- Determine the bulking characteristics of sand.
- Determine the workability of concrete using slumpcone, compaction factor andVee Bee consistometer tests.
- Know the arrangement of steel reinforcement for concrete elements.
- Study the workability properties of self compacting concrete.

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5310.2 - CO1	Ability to Determination of the fineness of cement by sieve analysis. Initial and final setting time of cement and normal consistency of cement by Vicat's Apparatus.	**A-3**
1F5310.2- CO2	Ability to calculate Shape Test for coarse aggregate – Flakiness Index test. –Elongation Index test.Shape Test for coarse aggregate – Angularity number test.	**C-6**
1F5310.2- CO3	Ability to Determine the building characteristics of given sand sample. Workability of concrete by slump cone test and compaction factor test.	**C-6**
1F5310.2 -CO4	Ability to Determination of Fineness Modulus of fine aggregate and Fineness Modulus of coarse aggregate sample by conducting sieve analysis.	**A-3**
1F5310.2- CO5	Ability to create Cutting, hooking, cranking and arrangement of reinforcement and Study of workability of self-compacting concrete.	**C-6**

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

DETAILED SYLLABUS
CONCRETE TECHNOLOGY PRACTICAL

Contents: Practical   Total: 48 Hrs.
LIST OF EXPERIMENTS
PART - A   **20hours**

1. Determination of the fineness of cement by Blains Permeability Apparatus or by sieveanalysis.
2. Initial and final setting time of cement with Vicat's Apparatus.
3. Determination of normal consistency of cement by Vicat's Apparatus.
4. Shape Test for coarse aggregate – Flakiness Index test.
5. Shape Test for coarse aggregate –Elongation Index test.
6. Shape Test for coarse aggregate – Angularity number test.
7. Determine the building characteristics of given sand sample.

PART - B   **21 Hours**

8. Determination of workability of concrete by slump cone test.
9. Determination of workability of concrete by compaction factor test.
10. Casting of concrete cube and compression test on concrete cube.
11. Determination of Fineness Modulus of fine aggregate sample and plot a particlesize distribution curve and also find the effective size and uniformity co-efficient.
12. Determination of Fineness Modulus of coarse aggregate sample by conducting sieveanalysis.
13. Vee- Bee Consistometer Test on concrete test.
14. Study of workability of self compacting concrete
15. Cutting, hooking, cranking and arrangement of reinforcement for:
A) singly reinforce Beam
B Lintel and sunshadec Column and footing

Test & Model Exam   **7 Hours**

SCHEME OF EXAMINATION:
DETAILED ALLOCATION OF MARKS

S.No	Description	PART A (35 MARKS)	PART B (60 MARKS)
1.	Procedure	5	10
2.	Tabulation and Observation	15	25
3.	Calculations	5	15
4.	Sketch / Graph	5	5
5.	Accuracy of result	5	5
	Viva Voce	5	
	Total		**100**

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No..	List of the Equipments	Quantity Required
1.	Slump cone apparatus	2 no.
2.	Compaction factor apparatus	1 no.
3.	Concrete cube mould 150*150*150 3sets	3 sets(9 no)
4.	Concrete cube mould 100*100*100 3sets	3 sets (9 no)
5.	Sieve test for fine aggregate made of brace 200mm dia complete set.	2 sets
6.	Sieve test for coarse aggregate made of brass 200mm dia complete set	2 sets
7.	Concrete mixing tray	2 no.
8.	Vee Bee Consistometer	1 no.
9	Weigh balance-digital up to 10kg capacity with 1gm accuracy battery backup with 8 hours	1no.
10.	Apparatus to find Flakiness index, Elongation index and Angularity number for Coarse Aggregate	1 no. each
11	Blaine Permeability apparatus	1 no.
12	Sieve No 9	2 nos.
13	Vicats apparatus	2 sets

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code   : 1F5310.3
Term   : V
Course Name   : GEOTECHNICAL ENGINEERING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
GEOTECHNICAL ENGINEERING LABORATORY	3	48	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

This subject is introduced to know the practical important of Geotechnical Engineering; the students studying this course will gain the knowledge in practical aspects which is directly linked to the construction of structures on different soil.

OBJECTIVES:

After completion of the course the students will be able to:
* Understand and determine physical and index properties of soil.
* Estimate the permeability and shear strength of soil.
* Compute optimum moisture content values for maximum dry density of soil throughvarious tests.
* Know the procedure for performing CBR test.
* Learn various compaction methods for soil stabilization.
* Study the SPT at construction site.

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5310.3 -CO1	Ability to Identify rocks from the given specimen	**A-4**
1F5310.3 -CO2	Ability to Determine water content, shrinkage limit, grain size.	**A-3**
1F5310.3 -CO3	Ability to Test strength Dilatancy, toughness, permeability, shear strength.	**A-4**
1F5310.3 -CO4	Ability to Determine the consolidation properties and un confined compressive strength.	**A-3**
1F5310.3-CO5	Ability to Demonstrate the CBR value and standard penetration.	**A-3**

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

DETAILED SYLLABUS

GEO TECHNICAL ENGINEERING LABORATORY - I

Contents: Practical

Sl. No.	List of Experiments	Hours
1	Identification of rocks from the given specimen.	
2	Determine water content of given soil sample by oven drying method as per IS: 2720(Part-II).	
3	Determine Shrinkage limit of given soil sample as per IS 2720 (Part- V).	
4	Determine grain size distribution of given soil sample by mechanical sieve analysis asper IS 2720 (Part- IV).	
5	Use different types of soil to identify and classify soil by conducting field tests-ThroughVisual inspection, Dry strength test, Dilatancy test and Toughness test.	
6	Determine coefficient of permeability by constant head test as per IS 2720 (Part- XVII).	41
7	Determine coefficient of permeability by falling head test as per IS 2720 (Part- XVII)	
8	Determine shear strength of soil by triaxial shear test as per IS 2720 (Part- XIII).	
9	Determine shear strength of soil by vane shear test as per IS 2720 (Part-XXX).	
10	Determine the consolidation properties of given soil sample.	

11	Find the unconfined compressive strength of given clay sample.	
12	Study of CBR value on the field as per IS2720 (Part – XVI).	
13	Study on Standard Penetration Test to find SBC of soil.	

AUTONOMOUS EXAMINATION
SCHEME OF VALUATION

S.No	Description	Max.Marks (100)
1.	Procedure	10
2.	Tabulation and Observation	40
3.	Calculations	25
4.	Sketch / Graph	10
5.	Accuracy of result	10
	Viva Voce	5
	Total	**100**

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No	Description	Number required
1.	Glass cup, oven, Desiccator, Weighing balance and other accessories	1 set
2.	Hot air oven	1 no.
3.	Shear testing machine	1 no.
4.	Triaxial testing machine	1 no.
5.	Permeameter mould, compacting equipment. Drainage bade, cap, graduated glass jar, stop watch	1 set
6.	Vane shear test apparatus	1 no.
7.	Unconfined compressive strength apparatus	1 no.

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code   : 1F5501
Term   : V
Course Name   : ENTREPRENEURSHIP AND STARTUPS

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
ENTREPRENEURSHIP AND STARTUPS	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topics	Hours
I	Entrepreneurship – Introduction and Process	12
II	Business Idea and Banking	12
III	Start ups, E-cell and Success Stories	12
IV	Pricing and Cost Analysis	10
V	Business Plan Preparation	11
Test & Model Exam		7
Total		**64**

RATIONALE:

Development of a diploma curriculum is a dynamic process responsive to the society and reflecting the needs and aspiration of its learners. Fast changing society deserves changes in educational curriculum particularly to establish relevance to emerging socio-economic environments; to ensure equity of opportunity and participation and finally promoting concern for excellence. In this context the course

on entrepreneurship and start ups aims at instilling and stimulating human urge for excellence by realizing individual potential for generating and putting to use the inputs, relevant to social prosperity and thereby ensure good means of living for every individual, provides jobs and develop Indian economy.

OBJECTIVES:

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

- Excite the students about entrepreneurship.
- Acquire Entrepreneurial spirit and resourcefulness.
- Understand the concept and process of entrepreneurship.
- Acquire entrepreneurial quality, competency and motivation.
- Learn the process and skills of creation and management of Entrepreneurial venture.
- Familiarize with various uses of human resource for earning dignified means of living.
- Know its contribution in and role in the growth and development of individual and the nation.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F5501-CO1	Ability to understand Entrepreneurship – Introduction and Process	**U-2**
1F5501-CO2	Ability to develop Business Idea and Banking	**U-2**
1F5501-CO3	Ability to analyse Start ups, E-cell and Success Stories	**A-4**
1F5501-CO4	Ability to create Pricing and Cost Analysis	**C-6**
1F5501-CO5	Ability to create Business Plan Preparation	**C-6**

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

DETAILED SYLLABUS

Contents: Practical

Unit	Name of the Topics	Hours
I	**CHAPTER:1.1Entrepreneurship – Introduction and Process** Concept, Functions and Importance- Myths about entrepreneurship- Pros and Cons of Entrepreneurship- Process of Entrepreneurship- Benefits of Entrepreneur - Competencies and characteristics- Ethical Entrepreneurship - Entrepreneurial Values and Attitudes- Motivation-Creativity - Innovation-Entrepreneurs - as problem solvers- Mindset of an employee and an entrepreneur - Business Failure — causes and remedies-Role of Networking in entrepreneurship	**12**
II	**CHAPTER:2.1 Business Idea and Banking** Types of Business: Manufacturing, Trading and Services- Stakeholders: sellers, vendors and consumers and Competitors E- commerce Business Models-Types of Resources - Human, Capital and Entrepreneurial tools and resources-Selection and utilization of human resources and professionals, etc.-Goals of Business; Goal Setting-Patent, copyright and Intellectual property rights-Negotiations - Importance and methods-Customer Relations and Vendor Management-Size and capital based classification of business enterprises-Various sources of Information-Role of financial institutions-Role of Government policy-Role of Lead banks in construction industry-Entrepreneurial support systems-Incentive schemes for state government-Incentive schemes for Central governments	**12**
III	**CHAPTER:3.1Start ups, E-cell and Success Stories** Concept of Incubation centre"s- Visit and report of DIC , financial institutions and other relevance institutions-Success stories of Indian and global business legends-Field Visit to MSME"s-Study visit to Incubation centers and start ups- Learn to earn-Startup and its stages-Role of Technology — E-commerce and Social Media- Role of E-Cell-E-Cell to Entrepreneurship	**12**
	CHAPTER : 4.1 Human Resource Management Meaning of manpower planning-Recruitment and Selection procedure - Payment of wages – factors determining the wage Methods of payment of wages – Time rate and Piece rate - Labour Turnover – definition, its causes, impact and remedy THE BOCW ACT– The Building and Other Construction Workers(Regulation of Employment and Condition of Services) Act, 1996.-The Building and Other Construction Workers (Regulation of Employment and Condition of Services) Central Rules, 1998	

IV	**CHAPTER:4.2 Industrial Legislation** : Need of Industrial legislation-Indian Factories Act — 1948 — Definition of Factory, main provisions regarding health, Safety and Welfare of Workers-Industrial Dispute Act – 1947 – Definition of Industrial dispute, Machineries for settlement of Industrial dispute in India **CHAPTER:4.3 Micro and Small Enterprises** Definition of Micro & Small enterprises-Meaning and characteristics of Micro and Small enterprise-Scope of SSI with reference to self-Employment-Procedure to start SSI – idea generation, SWOT analysis-Selection of site for factories.	10	
V	**Preparation of Project Reports for:** **CHAPTER:5.1 Project Identification And Formulation Report:** **Introduction:** Collection of Data. -Compilation of Data. - Analysis and Assimilation of Data.- Product Selection -Report Finalisation and Report Writing. **CHAPTER:5.2 Project Profile/Pre-Feasibility Report :**Introduction of the product - Market.- Man Power (Personnel Required).- Manufacturing Process- Plant and Machinery. **Cost of Project:** Means of Finance- Cost of Production- Annual Turnover- Profit - Profit on Investment. **CHAPTER: 5.3 Techno-Economical Feasibility Report (Tefr).** Introduction on product - Market Prospects and Marketing- Location - Manufacturing Programme and Annual Turnover -Manufacturing Process -Cost of Project- Means of Finance -Requirement of Raw materials, Consumables, Utilities and Working Capital - Organisational Structure, Management and Man Power-Project Implementation Schedule - Profitability and Cash Flow. **CHAPTER:5.4 Market Survey Report For Construction Materials:** Data Collection & Processing through Primary & Secondary Sources-Questionnaire - method, e-mail, by post, by phone -Present Status - Growth of the Industry- Import and Export -Present market Demand – Forecast - Future Prospect/Scope -Market Segmentation.	11	
	Test & Model Exam	**7 Hrs.**	

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code   : 1F007
Term   : V
Course Name   : CONCURRENT CARRIER DEVELOPMENT

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions	
	Hours / Week	Hours / Semester
CONCURRENT CARRIER DEVELOPMENT	5	80

Topics and Allocation of Hours:

UNIT	TOPICS
I	National Integration and Awareness
II	Social Awareness and Community Development
III	Health and Hygiene
IV	Environmental awareness and Conservation
V	Traffic Control Organization

Objectives:

1. To promote harmony and the spirit of common brotherhood amongst all the people of the country. To safe guard public property and abjure violence.
2. To develop the idea of ability and better thinking to work for the betterment of community.
3. To prevent illness and have positive health attitude, correct and complete knowledge of health is necessary.
4. To develop a world population that is aware of, and concerned about, the environmental and its associated problems
5. To provide for the safe, rapid, comfortable efficient, convenient, and environmentally compatible movement of people, goods, and services.

CO	Details	BTL
1F0007-CO1	Students to know the responsibility to see that injustice, inequality, oppression; exploitation, corruption, misuse of public money etc. are done away with. Students play a vital role in the society. They are the guardians of freedom, Justice, equality, ethics and social equilibrium.	**U-2**
1F0007-CO2	To understand social and ethical norms for behavior, and to recognize family, school, and community resources and supports.	**U-2**
1F0007-CO3	Students have the knowledge or skills to develop good personal hygiene habitson their own.	**A-4**
1F0007-CO4	To understand the fragility of our environment and the importance of itsprotection.	**C-6**
1F0007-CO5	The students will get a vast understanding on various traffic enforcementsrules and regulations.	**C-6**

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the topic	Hrs
I	**CHAPTER 1:** **National Integration and Awareness:** Introduction – Importance of National Integration – Essence of national integration : Cultural Integration, Economic Integration, Political Integration, Religious Integration, Social Integration- Necessity of National Integration : Maintenance of peace and harmony, Growth and development of the nation, Law and Order, Culture and religious development, dignity and self respect, welfare and wellbeing of the people-Role of NCC in nation Building.	
II	**CHAPTER 2:** **Social Awareness and Community Development:** Need of social awareness – Types of Social Awareness : Empathy, Organizational awareness- Service – How to build Social Awareness – Aims of Social Awareness – Different Social Awareness Programmes – Aims of Community development – Different community awareness programmes	
III	**CHAPTER 3:** **Health and Hygiene:** Introduction to the structure of the body – Personal hygiene - Food hygiene –water supply and its purification – Sanitisation – Waste Product/Refuse – Types of waste product – Sources of refuse – Collection an removal of refuse – Preventable diseases – Classification of disease – Preventive measures Yoga –Definition and meaning of Yoga-Principles of Yoga-	

	Asana – Definition, Types, Benefits - Effect of various yogic practices on Respiratory and Circulatory system-Method of performing various asanas –Padmasana, Siddhasana, Gyan Muthra, Suryanamaskar. Physical and Mental heath – Elements of good health – Objectives and scopes of health education – Characteristics of healthy mind, Measures to secure mental health	
IV	**CHAPTER 4:** **Environmental awareness and Conservation:** Introduction- Human activities and the environment – Depletion and deterioration – Deforestation – Forest and wild life – Water Resources – Global Warming – Depletion of Ozone layer – Role of the NCC cadets towards the environment – Ecology – Definition and components Conservation of environment and ecology – Resource depletion – Resource pollution – Environmental damage – Environment, life and ecology – Conservation measures – Methods of managements and conservation of natural resources.	
V	**CHAPTER 5:** **Traffic Control Organization:** Understanding Road Safety – Importance or road safety: Major causes of road accident – Role of Education sector in road safety – Role of general Community in road safety – Road Safety tips – Safety Devices – Safe and Responsible driving : Getting ready to drive before driving, Physical and mental alertness, Know your vehicle, Know your blind spots, Fasten Your seat belt, Turn on head lights at night and in poor light conditions – Driving License	

ASSESSMENT:

This is a compulsory credit course. The assessment is to provide a fair state of development of the student, so participation in classroom discussions, etc. will be used in evaluation.

- Final marks = 25% of Assignment mark + 50% of Online exam mark (proctored) + 25 % of External exam (unproctored).
- Unproctored means candidate will be taking the exam from college.
- The overall pass percentage is 4

Reference :

1. Cadet's Hand Book.
2. Public Health And Hygiene, Dr.Sudhar R.Wagh.
3. Question Answers Of Environment And Road Safety Awareness KindleEdition By Brijesh Pathak (Author) .
4. Environment And Road By Naresh Kumar (Author).
5. Traffic Safety And Environment: Conflict Or Integration Author Links OpenOverlay Panelburkhard E.Horn(Professor)A. Hh.Jansson.

VI TERM

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F6311
Term   :   VI
Course Name   :   CONSTRUCTION MANAGEMENT

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours/ Week	Hours/ Semester	Marks				Duration
			Internal Assessment	Board Examination	Total		
CONSTRUCTION MANAGEMENT	6 Hrs.	96 Hrs.	25	100*	100		3 Hrs.

*Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topics	Hours
I	Construction sector in India Feasibility study, planning of CivilEngineering Project and Contract Management	18
II	Construction Organisation and their Superintendence, Departmentalprocedure and Accounting	18
III	Scheduling and Time Management Resource Management	18
IV	Quality Management and Safety, Construction Disputes and their Settlement, Construction Labour and Legislation Ethics in Engineering	18
V	Entrepreneurship, Information Management and Computers andFinancial Management	17
	Test & Model Exam	7
	Total	**96**

RATIONALE:

This is an applied engineering subject. The subject aims at imparting basic knowledge about construction planning and management, site organisation, construction labour, control of work progress, inspection and quality control, accidents and safety and heavy construction equipment.

A good percentage of diploma engineers start working as small contractors. They require the knowledge of contractorship, tendering and preparation of specifications for various types of jobs. Also diploma holders adopt valuers as their profession. To promote entrepreneurship amongst these engineers, knowledge and associated skills in the above field becomes essential. Hence this subject is of great importance to diploma engineers.

OBJECTIVES:

On completion of the course, the students will be able to:

- Describe the Role of government and construction agencies in the field of housing.
- Describe the organization set up of PWD.
- Mention the construction activity and fixing the construction agency.
- Describe the aspects of inspection and quality control methods.
- Describe the banking system.
- Carryout the Feasibility study of a project.
- Understand the process of Planning for civil engineering projects.
- Explain the significance of CPM and PERT Techniques.
- Understand the types of contract system.
- Study the organization chart of a construction company.
- Understand the concepts and requirement of Entrepreneurship.
- Perform the Computation of Net present value.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F6311 -CO1	Ability to summarize the construction sector in India, planning for civil engineering project and contract management.	**U-2**
1F6311 -CO2	Ability to explain construction organization, departmental procedure and accounting.	**A-3**
1F6311 -CO3	Ability to analyze the scheduling, time management and resource management.	**A-4**
1F6311 -CO4	Ability to describe the quality management, construction disputes, human factors and labor legislation in construction.	**U-2**
1F6311 -CO5	Ability to describe the information management, computers and construction economics.	**U-2**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the topic	Hrs
I	**CHAPTER:1.1** **CONSTRUCTION SECTOR IN INDIA** Construction Management – Definition – Need-Scope-Objectives and functions – Role of government and private construction agencies – Types of construction sectors – Public and private functions of construction Management in national development – Construction Practice – the owner, consultant and contractor – Duties and Responsibilities – Various stages of a construction project.	5
	CHAPTER:1.2 **FEASIBILITY STUDY** Study of necessity of project – Technical feasibility, Financial Feasibility, Ecological feasibility, Resource feasibility, Recovery from the project, Economic Analysis – Building Economics – Preliminary studies – Analysis – Valuation.	
	CHAPTER:1.3 **PLANNING OF CIVIL ENGINEERING PROJECT** Objectives of planning – Public Project – Preliminary planning – Design Factors – Site utilization – Reconnaissance survey – Preliminary survey – Analysis and plotting of data – Estimate :Preliminary and detailed estimate – project report – Land acquisition – Administrative approval – Technical sanction – Budget provision – Private project- Advantages of planning to client and engineer – limitations – Stages of planning by owner and contractor	4
	CHAPTER:1.4 **CONTRACT MANAGEMENT** Types of contracts – Contract documents – Contractual obligations – Specifications – Tender Notice – Types – Tender Documents – Earnest money deposit (EMD) and Security Deposits (SD) – Scrutiny and acceptance of a tender – Contract agreement – Contractual changes and termination of contract – Work order – Execution of agreement – Sub Contract – Rights and duties of sub-contractor.	5
II	**CHAPTER : 2.1 CONSTRUCTION ORGANISATIONS AND THEIRSUPERINTENDENCE** Forms of business organizations - sole proprietorship — Partnership - Joint stock company,- Co-operative society,- and State enterprises- Advantages and Disadvantages -delegation of responsibility, personnel requirements and division of works — Decentralization - Construction supervision and Superintendence – Requirements and Responsibilities of Executives of the project — Qualities of Efficient construction Manager -	10

	Pay rolls and Records - Purchase and delivery of construction materials and equipments – Percentage completion report - Insurance record - Project office requirement - Organization chart of a small / medium / large construction company (broad outline only). **CHAPTER : 2.2 DEPARTMENTAL PROCEDURE AND ACCOUNTING** Organization of P.W.D. - Responsibilities of officers - Accounting procedure (administrative sanctions, technical sanctions, payment of bills) – Imprest and Temporary accounts – Cash book - Works register - Accounting for consumable materials - Record for tools and plants — Importance of M-book and its entries – Work charged establishment — Nominal muster roll (N.M.R) – Daily labour reports (D.L.R)	8
III	**CHAPTER : 3.1 SCHEDULING AND TIME MANAGEMENT** Scheduling — Definition — Preparation of Schedule — uses and advantages – Classification of Schedules – Methods of scheduling – Bar chart – Job layout – Work breakdown chart(WBC) – Network for projects management — Activity — Event — Dummies — Basic assumptions in creating a network – Rules for developing networks – Fulckerson"s rule for numbering the events - Critical Path Method Critical and Subcritical paths – Critical and Non critical activities/ events – Significance of critical path – Simple Problems - PERT – Timeestimate — EST, EFT, LST, LFT - Earliest expected time — Latest allowable occurrence time –Floats - Slack. Standard deviation - Variance — Simple problems.	10
	CHAPTER : 3.2 RESOURCE MANAGEMENT Definition – Need for resource management – Optimum utilization of resources- finance, materials, machinery, human resources - Resource planning – Resource levelling and its objectives – Construction planning – Stages – Operations – Schedule –Crashing – Need for crashing an activity – Methods and tips for crashing – Time Vs Cost optimization curve – Cost slope and its significance in crashing – simple problem on resource levelling (not for examination)-labour management in construction-Time-cost –quality.	8
IV	**CHAPTER : 4.1 QUALITY MANAGEMENT AND SAFETY:** Importance of quality – Elements of quality – Quality Assurances Techniques (Inspection, Testing, sampling) - Importance of safety – Causes of accidents – Role of various parties (Designer/Employer worker) in safety management – Benefits – Approaches to improve safety in construction.	6
	CHAPTER : 4.2 CONSTRUCTION DISPUTES AND THEIR SETTLEMENT: Introduction – Development of disputes – Categories of disputes – Modes of settlements – Arbitration.	3
	CHAPTER : 4.3 CONSTRUCTION LABOUR AND LEGISLATION : Need for legislation – Payment of wages Act – Factories Act – Contract labour (Regulation and abolition)Act – Employees Provident (EPF) Act.	4

	CHAPTER : 4.3 ETHICS IN ENGINEERING: Human Values – Definition of Ethics – Engineering ethics – Engineering as a profession – Qualities of professional – Professional institutions – Code of ethics – Major ethical issues - Ethical judgment – Engineering and management decision – Value based ethics.	**5**
V	**ENTREPRENEURSHIP** Definition – Role and Significance – Risks and Rewards – Concepts of Entrepreneurship — Profile and requirement of entrepreneur - Programmes existing in India – SISI, DIC, TANSIDCO – Funding and technical assistance to Entrepreneurship- NIDCO,ICICI,IDBI,IFCI,SFC.	**5**
	CHAPTER : 5.2 INFORMATION MANAGEMENT AND COMPUTERS Introduction – Definition of MIS – Out lines of MIS – Use of computers in construction industry – Requirements of MIS – A data base approach – Definition –Benefits - A data base approach to contractor"s account and its advantage – Basic concepts of estimation – Project management and operations simulation packages – Construction automation and Robotics.	**6**
	CHAPTER : 5.3 FINANCIAL MANAGEMENT Elements of cash flow – Time value of money – Interest rate of capital – Present value computation - NPV method – IRR method – simple problems - Global banking culture - Types of banks –Activities of Banks – Corporate finance – Personal, retail and rural banking – Treasury management-Cost Analysis-Direct Cost –Indirect Cost-total cost.	**6**

Reference Books

SI.No.	Title	Author	Publisher
1	Construction Management	Sanga Reddy. S	Kumaran Publications, Coimbatore
2	Construction Management and Planning	Sengupta.B, &H.Guha	Tata McGraw Hill Publishing Company Ltd.,
3	Construction Engineering & Management	Seetharaman. S	Umesh Publications, NaiSarak, New Delhi
4	Computer Applications in Construction	Boyd.C. & Paulson Jr	Tata McGraw Hill Publishing company
5	Construction of Structures and Management of Works	Rangwala.S.C	CharotarPublishing House, Anand 388 001, 2000
6	Project Planning and control with PERT and CPM	B C Punmia	Laxmi Publications

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F6209
Term : VI
Course Name : ESTIMATION, COSTING AND VALUATION

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examinations	Total	
ESTIMATION, COSTING AND VALUATION	6	96	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Introduction, Approximate Estimates, Measurements and Material Requirement and Specification & report writing	18
II	Preparation of Data and Rate Analysis	15
III	Areas and Volumes, Embankments and Cuttings	15
IV	Stages of Detailed Estimates ,Detailed Estimate	26
V	Valuation and Rent Calculation	15
	Test & Model Exam	7
	Total	**96**

RATIONALE:

Diploma holders in Civil Engineering are supposed to prepare material estimates and cost estimates for various Civil Engineering works namely; buildings, irrigation works, public health works and roads etc. In addition, they must have basic knowledge regarding analysis of rates and contracting principles of valuation. Therefore, this subject has great importance for diploma holders in Civil Engineering.

OBJECTIVES:

On completion of the course, the students will be able to:

- Learn the procedure for estimating and costing of Civil Engineering works.
- To write specifications for various materials and for different items of works.
- Write Technical reports on the proposed projects.
- Perform rate analysis for various items of works using Standard data & Schedule of Rates.
- Prepare detailed estimate of quantities of various Items of works.
- Calculate the value of a building/ property; to fix rent for a building adopting suitable method.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F6209-CO1	Ability to estimate the different types of building by approximate methods.	**U-2**
1F6209-CO2	Ability to analyze the rates for different item of works in the building.	**A-4**
1F6209-CO3	Ability to illustrate the area and volumes of irregular figures by various rules and determine the volume of embankments of roads and tank bunds.	**U-2**
1F6209-CO4	Ability to estimate the different types of residential and commercial buildings.	**E-5**
1F6209-CO5	Ability to analyze the value and rent of buildings	**A-4**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**CHAPTER: 1.1 INTRODUCTION:** Estimation – Definition of Estimate – Approximate estimate – Detailed estimate - Revised estimate – Supplementary estimate – Sub estimate – Annual maintenance estimate – Repair estimate – Complete estimate.	3
	CHAPTER: 1.2 APPROXIMATE ESTIMATES: Approximate estimates – Types – Plinth area method – Cubical content method – Service unit method – Typical bay method – Simple problems on preliminary estimate of a building project.	3
	CHAPTER: 1.3 MEASUREMENTS & MATERIAL REQUIREMENT: Units of measurements for works and materials – Degree of accuracy in measurements - Deduction for openings in masonry, plastering and white washing area – Painting co- efficient – out turn of works working out of materials requirements – cement, sand, bricks, aggregates etc based on thumb rules for different works.	5
	CHAPTER: 1.4 SPECIFICATION & REPORT WRITING: Specification – Necessity – Types of specifications – Essential requirements of specifications – Specifications for various items of works – steps involved in standard specification – Report writing – Points to be considered while writing a report – writing typical reports for works such as i. Buildings – Residential / Hospital / School ii. Laying a village road iii. Construction of a bridge iv. Water supply system for a village.	7
II	**CHAPTER: 2.1 PREPARATION OF DATA** Data – Theory – Main and sub data – Observed data – lead statement - Schedule of rates – Standard data book – Sundries – Lump sum provision – Preparation of data using standard data and schedule of rates:	5
	CHAPTER: 2.2 RATE ANALYSIS: Brick and stone masonry – Lime concrete and cement concrete – Flooring works and weathering course – R.C. works for slab, sunshade, beam and column – Partition wall – Form works for beams and slabs – Road works, WBM and surface dressing – White washing and painting works – A.C. sheet roofing – Apron and revetment works in canals – Wall plastering – Ceiling plastering – Pointing – Plumbing and sanitary works in buildings.	10

III	**CHAPTER: 3.1.AREAS AND VOLUMES** Areas of regular and irregular sections- Computation of Areas of Irregular figures- End Ordinate rule, Mid Ordinate rule, Average Ordinate rule, Trapezoidal rule, Simpson's rule- Problems- Volumes of regular and irregular solids- Computation of Volumes of Irregular solids- End Area rule, Mid Area rule, Average Area or Mean Area rule, Trapezoidal rule, Simpson's or Prismoidal rule.	6
	CHAPTER: 3.2.EMBANKMENTS AND CUTTINGS Areas of cross sections of embankments of roads, tank bunds etc – Level Section and Two level Section-Areas of cross sections of cuttings of canals, drains etc- Level Section and Two level Section-Determination of Volume of Earth work in Embankment / Cutting with level sections of varying heights/depths or with two level sections of uniform height/ depth.	9
IV	**CHAPTER: 4STAGESOFDETAILEDESTIMATE**: Taking off Quantities –Systems – Trade system – Group system – Advantages of group system – Methods – Long wall and Short wall method – Centre line method – Preparation of data – Abstract estimate – Lump sum provision and contingencies – Quantity surveyor – Duties – Essential Qualities. PreparedetailedestimateusingTradesystemandTakeoffquantitiesforallitem sofworksinthe following types of structures: • A small residential building with two / three rooms with RCC roof. • Two Storied building (framed structure)with RCC roof. • Industrial buildings with AC/GI sheet roof with steel trusses. • Community Hall with columns and T-beams. • Septic tanks with dispersion trench/ soak pit. • Rain water harvesting-Shallow recharge well. • R.C.C slab culvert. • Water Bound Macadam Road	26
V	**CHAPTER: 5.1 VALUATION** Purpose of valuation – Types – Book value – Market value – Salvage value – Scrap value – Depreciation – Obsolescence – Sinking fund – Land valuation – Mortage & Lease – Problems on valuation – Annuity – Definition & types only.	10
	CHAPTER: 5.2 RENT CALCULATION Fixation of rent – Outgoing – Gross & Net income – Years" Purchase – Capital cost – Standard rent – Market rent – Economical rent – Problems on rent calculation.	5
	Test & Model Exam	7hrs

Reference Books

Sl.No.	Title	Author	Publisher
1	Estimating & Costing	Rangawala	Charotor Publishing
2	Quantity Surveying & Valuation	N.A.Shaw	Khanna Publishers
3	Estimating & Costing	L.N.Dutta	& Sons
4	Method of measurement of building works and Civil Engineering works	Indian Standard	Indian Standard Code of Practice IS: 1200.

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME

(To be implemented to the students admitted from the year 2020-2021 onwards)

Course Name   :   DIPLOMA IN CIVIL ENGINEERING

Subject Code   :   1F6312.1

Semester   :   VI Semester

Subject Title   :   SUSTAINABLE AND GREEN BUILDING
TECHNOLOGY

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Board Examinations	Total		
SUSTAINABLE AND GREEN BUILDING TECHNOLOGY	5	80	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

Unit	Topics	Hours
I	Introduction to Green Building and Design Features	15
II	Energy Audit and Environmental Impact Assessment (EIA)	15
III	Energy and Energy conservation	15
IV	Principles and planning of Green building	14
V	Rating System	14
	Test & Model Exam	7
	Total	**80**

RATIONALE:

On learning Sustainable and Green Building Materials, the students will be able to Identify various requirements for green building, use different steps in environmental impact assessment, relate the construction of green building with prevailing energy conservation policy and regulations, supervise the construction of green building construction using green materials and focus on criteria related to particular rating system for assessment of particular Green building.

OBJECTIVES:

After the completion of this course, the students will be able to:

- Know various aspects of green buildings.
- Use different steps involved in measuring environmental impact assessment.
- Relate the construction of green building with prevailing energy conservation policy and regulations.
- Know and identify different green building construction materials.
- Learn different rating systems and their criteria

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F6312.1-CO1	Ability to evaluate Green Building and Design Features	**A-4**
1F6312.1-CO2	Ability to estimate Energy Audit and Environmental Impact Assessment (EIA)	**U-2**
1F6312.1 -CO3	Ability to Illustrate Energy and Energy conservation	**A-2**
1F6312.1 -CO4	Ability to Understand Principles and planning of Green building	**U-2**
1F6312.1 -CO5	Ability to Evaluate Rating System	**A-4**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**CHAPTER:1INTRODUCTION TO GREEN BUILDING AND DESIGN FEATURES** Definition of Green Building, Benefits of Green Building, Components/ features of Green Building, Site selection, Energy Efficiency, Water efficiency, Material Efficiency, Indoor Air Quality. Site selection strategies, Landscaping, building form, orientation, building envelope and fenestration, material and construction techniques, roofs, walls, fenestration and shaded finishes, advanced passive heating and cooling techniques, waste reduction during construction.	**15**
II	**ENERGY AUDIT AND ENVIRONMENTAL IMPACT ASSESSMENT (EIA)** **CHAPTER:2.1 Energy Audit**: Meaning, Necessity, Procedures, Types, Energy Management Programs. **CHAPTER:2.2 Environmental Impact Assessment (EIA):** Introduction, EIA regulations, Steps in environmental impact assessment process, Benefits of EIA, Limitations of EIA, and Environmental clearance for civil engineering projects.	**7** **8**
III	**CHAPTER:3ENERGY AND ENERGY CONSERVATION** Renewable Energy Resources: Solar Energy, Wind Energy, Ocean Energy, Hydro Energy, Biomass Energy. Non-renewable Energy Resources: Coal, Petroleum, Natural Gas, Nuclear Energy, Chemical Sources of Energy, Fuel Cells, Hydrogen, Biofuels.Energy conservation: Introduction, Specific objectives, present scenario, Need of energy conservation, LEED India Rating System and Energy Efficiency. Energy-saving houses, Green House, Passive house, Passive house construction, Low-energy house, Zero-energy house, Energy consulting, Energy efficiency:	**15**

	CHAPTER:4 Principles and planning of Green building	
IV	Features: Salient features of Green Building, Environmental design (ED) strategies for building construction. Process: Improvement in environmental quality in civil structure Materials: Green building materials and products- Bamboo, Rice husk ash concrete, plastic bricks, Bagasse particle board, Insulated concrete forms. reuse of waste material-Plastic, rubber, Newspaper wood, Nontoxic paint, Green roofing. Housing modernization and management (building and construction safety, energy efficiency in housing, Property Refurbishment / Upgrade / Modernization / Renovation - Modular kitchens, bathrooms,	14
V	CHAPTER:5 RATING SYSTEM Introduction to (LEED) criteria, Indian Green Building council (IGBC) Green rating, Green Rating for Integrated Habitat Assessment. (GRIHA) criteria Heating Ventilation Air Conditioning (HVAC) unit in green Building Functions of Government organization working for Energy conservation and Audit(ECA) - National Productivity council(NPC) Ministry of New and Renewable *Energy* (MNRE) Bureau of Energy efficiency (BEE) - BER (Building Energy Rating) - Certificates — Plumbing and Electrical to heating efficiency	14
	Test & Model Exam	**7 Hrs.**

Reference Books

Sl.No.	Title	Author	Publisher
1.	Sustainable construction: Green Building design and Delivery	Kibert, C.J.,	John Wiley Hobouken, New Jersey
2.	Non-conventional Energy Resources	Chauhan, D S Sreevasthava, 176	P a g e S K.,	New Age International Publishers, New Delhi.
3.	Energy Technology	O.P. Gupta	Khanna Publishing House, New Delhi
4.	Alternative Building Materials and Technologies	Jagadeesh, K S, Reddy Venkatta Rama & Nanjunda Rao, K S	New Age International Publishers, Delhi.
5	Handbook of Green Building Design and Construction	Sam Kubba	Butterworth-Heinemann.

SESHASAYEE INSTITUTE OF TECHNOLOGY(Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : 1F6312.2 -DIPLOMA IN CIVIL ENGINEERING
Course Code : 1F6312.2
Term : VI
Course Name : URBAN PLANNING AND DEVELOPMENT

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Board Examinations	Total		
URBAN PLANNING AND DEVELOPMENT	5	80	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	Town planning Principles, Surveys and Zoning	15
II	Housing and Slums	15
III	Public Buildings, Parks, Play Grounds, Master Plan and Re-planning Existing Towns	15
IV	Urban Roads and Traffic Management	14
V	Building Bye-Laws and Miscellaneous Topics	14
	Test & Model Exam	7
	Total	**80**

RATIONALE:

Considerable employment opportunities are available in urban sector. This subject aims at imparting knowledge and skill in the Town Planning and surveys, urban roads and Traffic management, Master plan and Building bye laws which can be promoted for upgrading standards of life in urban areas.

OBJECTIVES:

On completion of the course, the students will be able to:

- Understand the principle of Town Planning and surveys.
- Know the requirements of housing and slum clearance.
- Learn the requirement of Public buildings, parks and play grounds.
- Understand the requirements and types of Urban roads and Traffic management.
- Know the Importance of housing and slum clearance programmes.
- Prepare Master plan and for Re-planning of existing Towns.
- Learn the Building bye laws and other miscellaneous topics.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F6312.2-CO-1	Ability to understand the principles of town planning, surveys and zoning.	**A-2**
1F6312.2-CO2	Ability to illustrate the Housing and slums.	**A-3**
1F6312.2-CO3	Ability to structure the Public building parks, playgrounds and existing town	**C-5**
1F6312.2-CO4	Ability to Develop the Urban Roads and traffic management.	**A-3**
1F6312.2-CO5	Ability to understand Building bye-laws and Transportation planning.	**A-2**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**CHAPTER:1.1 TOWN PLANNING PRINCIPLES** General - Evolution of planning - Objects of town planning –Economic justification for town planning - Principles of Town planning - Necessity of town planning - Origin of towns – Growth of towns – Stages in town development - Personality of town -Distribution of land - Forms of planning - Site for an ideal town - Requirements of new towns - Planning of a modern town - Powers required for enforcement of Town planning scheme - Cost of Town planning -Present position of Town Planning in India.	7
	CHAPTER:1.2 SURVEYS General – Necessity - Collection of Data - Types of surveys for planning a new town - Uses of surveys.	3
	CHAPTER:1.3 ZONING Meaning of the term - Uses of land, objects and Principles of Zoning - Advantages of Zoning - Importance of Zoning – Aspects of Zoning – Transition Zone – Economy of Zoning – Special Economic Zone (SEZ) - Zoning powers - Maps for Zoning.	5
II	**CHAPTER:2.1 HOUSING** General - Importance of housing - Demand for houses - Building site - Requirements of residential buildings -Classification of residential buildings - Design of residential areas - Rural Housing - Agencies for housing -Investment in housing - HUDCO – CIDCO - Housing problems in India.	7
	CHAPTER:2.2 SLUMS General - Causes of slums - Characteristics of slums - Effects of slums - Slum clearance - Problems in removing slums - Improvement Works Open plot scheme - Slum clearance and rehousing - Prevention of slum formation - Resources for slum clearance programmes - The Indian slums.	8
III	**CHAPTER:3.1 PUBLIC BUILDINGS** General – Suitable Location of Public Buildings – Classification of Public Buildings - Principles of design of public buildings – Town centres - Grouping of public buildings – Requirements of Public buildings – Green House– Civic aesthetics.	3
	CHAPTER:3.2 PARKS AND PLAY GROUNDS General – Types of recreation - Necessity of open spaces - Location of urban green spaces - Classification of parks – Park systems - Park design – Finance for parks – Parkways – Playgrounds - Space standards - Landscape architecture.	4

	CHAPTER:3.3 MASTER PLAN General – Objects – Necessity - Factors to be considered - Data to be collected - Drawings to be prepared - Features of master plan - Planning standards – Report – Stages of preparation – Method of Execution - Conclusion.	4
	CHAPTER:3.4 RE-PLANNING EXISTING TOWNS General - Objects of re-planning – Analyzing the defects of existing towns - Data to be collected –difficulties in Master Planning existing towns /cities - Urban renewal projects- merging of suburban areas– Decentralization - Satellite Towns – Smart cities- definition and features- Surface drains – Refuses of Towns – Refuse disposal methods.	4
IV	**CHAPTER:4.1 URBAN ROADS** General - Objects - Requirements of good city road – Factors to be considered – Classification of urban roads – Types of street systems - Through and By-pass roads – Outer and inner ring roads - Expressways – Freeways – Precincts - Road aesthetics.	6
	CHAPTER:4.2 TRAFFIC MANAGEMENT General - Object – Traffic survey - Traffic congestion – Traffic control - Traffic diversion - Road junction –Parking - Traffic capacity of road - One way traffic - Road traffic problems – Use of islands and flyovers at crossings – causes of road accidents - Traffic signal – Advantages and disadvantages of Automatic Light signals – Road sign – Road marking - Name boards of streets- Direction boards - Street lighting in a town – Traffic problem of existing towns.	8
V	**CHAPTER:5.1 BUILDING BYE -LAWS** General - Objects of bye-laws - Importance of bye-laws - Function of local authority - Responsibility of owner - Applicability of bye- laws - Set-backs to buildings – Necessity of setbacks - Light plane – Plot coverage - Floor space index- Maximum Height of buildings - Off-street parking – Fire protection - Minimum width of streets and plot sizes – Some other terms - Principles underlying in framing building bye- laws – Building bye-laws for residential area of a typical town planning scheme – Building bye-laws for other types of buildings -Development control rules - General rules of metropolitan Area - CMDA rules.	7
	CHAPTER:5.2 MISCELLANEOUS TOPICS Airports – Location - size - Noise control - Parts of an airports - Betterment and compensation – City blocks –Conurbations - Cul- de-sac streets - Focal point - Green belt - Public utility services - Rapid transit – Remote sensing application – Urban planning using remote sensing – Site suitability analysis Location of Bus Terminus, Whole sale markets, Exhibition Centres etc., – Location for water/sewage treatment plants, location for waste disposal etc.,– Transportation planning.	7

Reference Book:

Sl.No.	Title	Author	Publisher
1.	Town planning	S.C.Rangwala	Charotar publisher (2011) , publisher
2.	Town planning	K.S.Rangwala and P.S.Rangwala	Charotar Publishing House,15th Edition,1999.
3.	Remote sensing methods and application	Michael Hord R.	John Wiley and Sons, NewYork, 1986.
4.	Urban and regional planning	KA. Ramegowda	University of Mysore

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F 6312.3
Term   :   VI
Course Name   :   WATER RESOURCES ENGINEERING

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
WATER RESOURCES MANAGEMENT	5 Hrs.	80 Hrs.	25	100*	100	3 Hrs.

*Examinations will be conducted for 100 marks and it will be reduced to 75 Marks.

Topics and Allocation of Hours

Unit	Topics	Hours
I	Introduction and Hydrology	15
II	Ground Water and Management of Ground Water	15
III	Rivers and River Training Works, Storage Works	15
IV	Distribution Works and Management of Canal Irrigation	14
V	Water Shed Management and Water Harvesting and Recycling	14
	Test & Model Exam	7
	Total	**80**

RATIONALE:

Diploma holders in civil engineering have to supervise the construction, repair and maintenance of canals, head works, river training works, cross drainage works, regulatory and other works. Some of the diploma holders are also engaged for preventing water logging and irrigation by tube wells. This subject imparts knowledge regarding hydrology, flow irrigation — storage and distribution system, constructional features of head works, river training works, cross drainage works, causes and prevention of water logging and construction of tube wells.

OBJECTIVES:

On completion of the course, the students will be able to:

- Understand water resource potential in India and need for water resourcemanagement.
- Understand the components of hydrological cycle and hydrograph.
- Understand the occurrence of ground water and ground water exploration methods.
- Understand the ground water basin management concept.
- Learn the classification of rivers and river training works.
- Know the different types of storage works and dam structures.
- Understand the distribution system of canals and management of canal irrigation.
- Understand the concept of water shed management including GIS approach.
- Learn the types of detention basins and reclamation of water logged lands.
-

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F6312.3 -CO1	Ability to explain the hydrology	**A-4**
1F6312.3 -CO2	Ability to summarize the ground water and ground water management.	**U-2**
1F6312.3 -CO3	Ability to describe the types of rivers, river training works and storage works.	**U-2**
1F6312.3 -CO4	Ability to illustrate the distribution works and canal irrigation management.	**U-2**
1F6312.3 -CO5	Ability to explain water shed management and water harvesting and recycling.	**A-4**

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

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**CHAPTER:1.1 INTRODUCTION** Water resources — world water inventory - Importance of water resources - Necessity for conservation and development of water resources — water resources of India - water resources management - purpose - factors involved in water resources management.	7
	CHAPTER:1.2 HYDROLOGY Introduction — Definition - Application of Hydrology in engineering - Hydrological cycle - Precipitation — forms of Precipitation - measurements of rain fall - Rain gauge - types of rain gauges - rain gauge network — mean rainfall over a drainage basin — methods - Radar and Satellite Measurements of rainfall - runoff - Estimation of runoff - losses — Hydrograph — Unit Hydrograph – uses	8
II	**CHAPTER:2.1 GROUND WATER** Ground water resources- zones of Ground water-Aquifer - types-terms used –porosity, permeability, yield, specific yield, specific retention, coefficient of storage, specific capacity — Darcy"s law- measurement of yield of well -pumping test- recuperation test- ground water exploration –geo physical methods -Electrical resistivity method — seismic resistivity method- logs.	8
	CHAPTER:2.2 MANAGEMENT OF GROUND WATER Concept of basin management - Ground water basin investigations - data collection and field work -mining yield - perennial yield - salt balance - basin management by conjunctive use - artificial recharge of Ground water - recharge methods.	7
III	**CHAPTER:3.1 RIVERS AND RIVER TRAINING WORKS** Classification of river - Major rivers in India and Tamil Nadu -Inter linking of rivers in India and its importance – flood - flood forecasting - flood control in India. River training - objectives of river training - classification of river training - methods of river training — levees - guide banks — spurs — types - artificial cut-offs — launching apron - pitching of banks - pitched islands - miscellaneous methods.	7

	CHAPTER:3.2 STORAGE WORKS	**8**
	Surface storage - purpose of surface storage – tanks – types - tank weirs – tank outlet – reservoirs – types - storage capacity of reservoir -methods of determination of storage capacity of reservoir – reservoirlosses – dams - classification of dams - selection of dam site - Earth dams – types - methods of construction- causes of failure of earth dam - remedial measures – spillway - types - spillway crest gates- types — sluiceway - types.	
IV	**CHAPTER:4.1 DISTRIBUTION WORKS** Irrigation Canal - Typical cross section of canal - components of canal section - classification of canal -alignment of canal - canal head works types - components of diversion head works - cross drainage works types - canal losses - lining of canal – necessity - types of lining.	**7**
	CHAPTER:4.2 MANAGEMENT OF CANAL IRRIGATION Canal irrigation system - Need for canal irrigation management - objectives of canal irrigation management - methods of improvingcanal irrigation management - cropping pattern - need for crop rotation - crop water requirement - water delivery system - irrigation scheduling - frequency of irrigation - optimum use of irrigation water - irrigation efficiencies - conservation of water on the field - farmer"s participation - irrigation manager-criteria for good canal irrigation management-channel capacity-canal lining-operation and maintenance of canal irrigation system.	**7**
V	**CHAPTER:5.1 WATER SHED MANAGEMENT** Water shed - classification of water sheds - integrated approach for water shed management - role of remote sensing and GIS in water shed management - soil and water conservation — Necessity - soil erosion — causes - effects — remedial measures against erosion - contour bunding - strip cropping - bench terracing — check dams - vegetated water way — afforestation - crop residue - land drainage - surface drains - sub surface drains.	**8**
	CHAPTER:5.2 WATER HARVESTING AND RECYCLING water harvesting - runoff collection - onsite detention basin - ponds - types - Seepage control – methods -evaporation control - Recycling of harvested water - waste water recharge for reuse — methods - water logging-remedial measures-soil reclamation-treatment and recycling of waste water for vegetation.	**6**
	Test & Model exam	**7 Hrs.**

Reference Books :

Sl.No.	Title	Author	Publisher
1.	Hydrology and water resources engineering	Santhosh Kumar Garg	khannapublishers, Delhi
2.	Irrigation and Water Resources Engineering	G.L.Asawa	New ageinternational(p) ltd.,publishers, New Delhi.
3.	Ground water Hydrology	David Keith Todd	John wiley &sons,Singapore
4.	Irrigation water management	Dilip Kumar Majumdar	Principles and Practice, PHI Pvt.Ltd.NewDelhi-1
5.	Irrigation and water powerEngineering	Madan Mohan Das&Mimi Das Saikia	PHI learning pvt. Ltd., NewDelhi-1
6.	Engineering hydrology	K.Subramanya	Tata McGraw-Hill publishing company ltd.,New Delhi

SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS
F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name   :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F6403
Term   :   V
Course Name   :   COMPUTER APPLICATIONS IN CIVIL ENGINEERING
PRACTICE

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Board Examinations	Total		
COMPUTER APPLICATIONS IN CIVIL ENGINEERING PRACTICE	4	64	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

Computers play a very vital role in present day life, more so, in all the professional life of engineering. In order to enable the students use the computers effectively in problem solving, this course offers various engineering applications of computers in civil engineering.

OBJECTIVES:

On completion of the course, the students will be able to:
- Know about CAD commands.
- Understand building components.
- Draw building drawing using CAD software.
- Prepare approval drawing for submission to authority

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F6403-CO1	Ability to Prepare the Estimate sheet with given data (provide all the measurement details) and calculate the quantity using formula bar in MS Excel.	**U-2**
1F6403-CO2	Ability to Calculate Area and Elongation using Formula bar MS Excel.	**U-2**
1F6403-CO3	Ability to Generation of detailed drawings for given specification and Preparation of Bar Bending schedule using STAAD.Pro Software.	**A-4**
1F6403-CO4	Ability to develop the CPM / PERT Network for the proposed simple building project using MS Project Software	**C-6**
1F6403-CO5	Ability Develop Aerial map of given area using AUTOCAD MAP 3D Software.	**C-6**

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

EXERCISE:
1. Prepare the Estimate sheet with given data (provide all the measurement details)and calculate the quantity using formula bar.
2. Prepare the Abstract sheet for the given data and calculate Amount and TotalAmount using Formula bar (Use separate column for rates and units)
3. Design and Analysis problems
4. Calculate Area and Elongation using Formula bar
5. Calculate Effective depth„d" and Area of Steel „Ast "using Formula Bar for given dimension of Masonry/R.C.C Dam ie. top width, bottom width, height of Dam , height of water, Specific weight of masonry/R.C.C. , Sp.wt of Water etc,. Find thebase pressure and check the stability of the dam
6. Finding centre of gravity; IZZ and IYY of I, L,T and channel sections
7. Preparation of Bar Bending schedule for a Continuous one way slab (with three equal spans) STAAD.Pro Software.
8. Preparation of Bar Bending schedule for a Simply supported two-way slab STAAD.Pro Software.
9. Preparation of Bar Bending schedule for a Restrained two - way slab STAAD.Pro Software.

10. Preparation of Bar Bending schedule for a Dog-legged staircase STAAD.Pro Software.
11. Preparation of Bar Bending schedule for a R.C.C Column with square isolated footing STAAD.Pro Software.
12. Prepare the analysis of RCC structures using STAAD.Pro Software.
13. Prepare the design of RCC structures using STAAD.Pro Software.

AUTONOMOUS EXAMINATION
SCHEME OF EXAMINATION:

In the examination the students have to be given two experiments one fromPart A and another from Part-B.

DETAILED ALLOCATION OF MARKS

S.No	Description	Part - A Max.Marks(40)	Part - B Max.Marks (55)
1.	Procedure	5	5
2	Tabulation and Observation	15	25
3	Calculations	10	15
4	Sketch / Graph	5	5
5	Accuracy of result	5	5
	Viva Voce	5	
	Total	**100**	

LIST OF EQUIPMENTS (for a batch of 30 students):

S.No.	List of the Equipments	Quantity Required
1.	Computers	30 Nos.
2.	Suitable Software for Electronic Spread Sheet	30 Users
3.	Suitable RCC Detailing Software	30 Users
4.	Suitable Structural Analysis Software	30 Users
5.	Suitable Project Management Software	30 Users
6.	Suitable GIS Software	30 Users

ANNEXURE- II
SESHASAYEE INSTITUTE OF TECHNOLOGY (Autonomous), TRICHY-10
1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name   :   DIPLOMA IN CIVIL ENGINEERING
Course Code   :   1F6313.1
Term   :   VI
Course Name   :   ESTIMATION AND COSTING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hours / Week	Hours / Semester	Marks				Duration
			Internal Assessment	Board Examinations	Total		
ESTIMATION AND COSTING LABORATORY	4	64	25	100*	100		3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:
        Estimation and Costing Lab deals with the procedure for estimating and costing of Civil Engineering works and to perform rate analysis for different items associated with construction projects.

OBJECTIVES:
After completing this course, students will be able to:
- Select modes of measurements for different items of works.
- Prepare detailed estimate of a civil engineering works.
- Use relevant software for estimating the quantities and cost of items of works.
- Justify rate for given items of work using rate analysis techniques

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F6313.1 - CO1	Ability to prepare the detailed estimate for given material, labour wages, hire charges of tools & equipments	**A-3**
1F6313.1-CO2	Ability to measure the actual measurements of a given structure	**E-5**
1F6313.1 -CO3	Ability to calculate a detailed quantities for different items of a given building.	**A-3**
1F6313.1 -CO4	Ability to estimate the all engineering works.	**U-2**
1F6313.1-CO5	Ability to schedule the bar bending for the structural elements.	**A-3**

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

DETAILED SYLLABUS

- Prepare the list of items to be executed with units for detailed estimate of a given structure from the given drawing.
- Prepare a report on market rates for given material, labour wages, hire charges of tools & equipments required to construct the given structure as mentioned in at Serial number 1 above.
- Recording in Measurement Book (MB) for any four items.
- Prepare bill of quantities of given item from actual measurements. (any four items).
- Prepare approximate estimate for the given engineering works.
- Calculate the quantity of items of work from the given set of drawings using standard measurement sheet for load bearing residential structure using description of item from (1BHK Building with staircase).
- Prepare detailed estimate from the given set of drawings using "standard measurement and abstract format" for RCC framed structure using description of item (G+1 Building).
- Calculate the reinforcement quantities from the given set of drawings for a room size of 3 m x 4m with bar bending schedule.
- Prepare detailed estimate of bitumen road of one kilometer length from the given drawing.
- Prepare detailed estimate of small Septic tank from the given set of drawings.
- Prepare bar bending schedule for the given singly reinforced and doubly reinforced beams.
- Prepare bar bending schedule for the given continuous beam.
- Prepare bar bending schedule for the given one way slab.
- Prepare bar bending schedule for the given two way slab.
- Prepare bar bending schedule for the given square column and square footing

Test & Model Exam 7 Hrs

AUTONOMOUS EXAMINATION
SCHEME OF VALUATION
ALLOCATION OF MARKS

DETAILED ALLOCATION OF MARKS

S.No	Description	Marks
1.	Tabulation and Observation	50
2.	Calculations	35
3.	Accuracy of result	10
4.	Viva-Voce	5
	Total	**100**

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F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code   : 1F6313.2
Term   : VI
Course Name   : HIGHWAY ENGINEERING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
			Marks			
	Hours / Week	Hours / Semester	Internal Assessment	Board Examinations	Total	Duration
HIGHWAY ENGINEERING LABORATORY	4	64	25	100*	100	3 Hrs.

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks.

RATIONALE:

In this course, the students learn about testing of aggregates, bitumen and preparing areport about roadwork's.

OBJECTIVES:
After the completion of this course, the students will be able to:
- Identify the types of roads as per IRC recommendations.
- Understand the geometrical design features of different highways.
- Perform different tests on road materials.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F6313.2 -CO1	Ability to sketch the standard cross sections of Expressways, Freeways, NH/SH, MDR/ODR	A-3
1F6313.2 -CO2	Ability to Test the Flakiness and elongation index and angularity of aggregates.	E-5
1F6313.2 -CO3	Ability to Experiment softening point, penetration and Ductility of bitumen.	A-4
1F6313.2 -CO4	Ability to Demonstrate the dense of bituminous macadam design and prepare the report	U-2
1F6313.2 -CO5	Ability to Examine the constructed road visual inspection , Hill road and also the drainage condition	A-3

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

DETAILED SYLLABUS
Contents: Practical

	Name of the Topics	Hrs
	• Draw the sketches showing standard cross sections of Expressways, Freeways, NH/SH, MDR/ODR. • Flakiness and Elongation Index of aggregates. • Angularity Number of aggregates. • Los Angeles Abrasion test. • Softening point test of bitumen. • Penetration test of bitumen. • Ductility test of Bitumen. • Study of dense Bituminous macadam design Visit the constructed road for visual inspection to identify defects and suggest remedial measures. • Prepare the photographic report containing details for exercise No.9 Visit the hill road constructed site to understand its components. • Prepare the photographic report containing details for exercise No.11 Visit the road of any one type (flexible or rigid) to know the drainage condition.	18
	Test & Model Exam	7 Hrs.
	Total	48 Hrs.

SCHEME OF VALUATION
ALLOCATION OF MARKS

S.No	Description	Marks
1.	Procedure	15
2.	Tabulation and Observation	40
3.	Calculations	30
4.	Accuracy of result	10
5.	Viva-Voce	5
	Total	**100**

LIST OF EQUIPMENTS(for a batch of 30 students):

S. NO.	LIST OF EQUIPMENTS	QUANTITY REQUIRED
1.	Sieve test for coarse aggregate made of brace 200mm dia complete set	2 sets
2.	Length gauge and Thickness gauge	2 Nos.
3.	Los Angeles Abrasion testing equipment	1 no.
4.	Viscometer	1 no.
5.	Ductility testing machine, briquette mould, water bath	1 No.
6.	Flash and Fire point apparatus	1 set
7.	Bitumen Penetro meter	1 No.
8.	Weigh balance-digital upto 10kg capacity with 1gm accuracy battery backup	1No

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F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Programme Name : DIPLOMA IN CIVIL ENGINEERING
Course Code   : 1F 6313.3
Term   : VI
Course Name   : WATER RESOURCES ENGINEERING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination				
	Hour/ Week	Hours/ Semester	Marks				Duration
			Internal Assessment	Board Examination	Total		
WATER RESOURCES ENGINEERING LABORATORY	4 Hrs.	64 Hrs.	25	100*	100	3 Hrs.	

* Examinations will be conducted for 100 marks and it will be reduced to 75 marks

RATIONALE:
        Diploma holders in civil engineering have to supervise the construction, repair and maintenance of canals, head works, river training works, cross drainage works, regulatory and other works. Some of the diploma holders are also engaged for preventing water logging and irrigation by tube wells. This subject imparts knowledge regarding hydrology, flow irrigation — storage and distribution system, constructional features of head works, river training works, cross drainage works, causes and prevention of water logging and construction of tube wells.

OBJECTIVES:
The following are the objectives of this course:
- To learn estimation of hydrological parameters.
- To understand water demand of crops and provisions to meet the same.
- To know planning of reservoirs and dams.
- To design irrigation projects, canals and other diversion works.

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1F6313.3 -CO1	Ability to Calculate average rainfall for the given area using arithmetic mean method, isohyetal, Theissen polygon method.	**A-3**
1F6313.3 –CO2	Ability to Estimate crop water requirement for the given data. Estimate capacity of the canal for the given data.	**A-4**
1F6313.3 –CO3	Ability to Calculate reservoir capacity from the given data. Calculate control levels for the given data for a given reservoir. Draw a labeled sketch of the given masonry/earthen dam section.	**A-3**
1F6313.3 –CO4	Ability to Prepare a presentation on the technical details of any one micro or minor irrigation scheme and Prepare a model of any irrigation structure using suitable material.	**C-6**
1F6313.3 –CO5	Ability to Draw a labeled sketch of the given diversion head works and Cross Drainage works. Design a canal section for the given conditions with estimation of the quantity of material required for lining.	**A-3**

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

DETAILED SYLLABUS

WATER RESOURCES ENGINEERING LABORATORY

Contents: Practical

Exercise	List of Experiments	Hrs
1	Calculate average rainfall for the given area using arithmetic mean method.	
2	Calculate average rainfall for the given area using isohyetal, Theissen polygon method.	
3	Delineation of contributory area for the given outlet from the given topo-sheet.	
4	Estimate crop water requirement for the given data.	

5	Estimate capacity of the canal for the given data.	
6	Calculate reservoir capacity from the given data.	
7	Calculate control levels for the given data for a given reservoir.	
8	Draw a labeled sketch of the given masonry/earthen dam section.	
9	Draw the theoretical and practical profile of the given gravity dam section	
10	Prepare a presentation on the technical details of any one micro or minor irrigationscheme.	57
11	Prepare a model of any irrigation structure using suitable material	
12	Prepare a maintenance report for any major/minor irrigation project site in the vicinityof your area, based on field visit.	
13	Prepare summary of the technical details of any existing water resource project inthe vicinity of your area.	
14	Draw a labeled sketch of the given diversion head works and Cross Drainage works.	
15	Design a canal section for the given conditions with estimation of the quantity ofmaterial required for lining.	
	Test & Model Exam	**7hrs**

DETAILLED ALLOCATION OF MARKS

S.No	Description	Marks
1.	Tabulation and Observation/ Procedure	35
2.	Calculations	45
3.	Accuracy of result	15
4.	Viva-Voce	5
	Total	**100**

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1: DIPLOMA IN CIVIL ENGINEERING SYLLABUS

F-SCHEME
(To be implemented for the students admitted from the year 2020-21 onwards)

Course Name	:	DIPLOMA IN CIVIL ENGINEERING
Subject Code	:	1F6404
Semester	:	VI Semester
Subject Title	:	**PROJECT WORK AND INTERNSHIP**

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Subject	Instructions		Examination			Duration
	Hours / Week	Hours / Semester	Marks			
			Internal Assessment	Board Examination	Total	
PROJECT WORK AND INTERNSHIP	6 Hrs.	96 Hrs.	25	100*	100	3 Hrs.

*   Examinations will be conducted for 100 marks and it will be reduced to 75 marks. Minimum marks for Pass is 50 out of which minimum 50 marks should be obtained out of100 marks in the Board Examination alone.

RATIONALE:

The students of all the Diploma Courses have to do a Project Work as part of the Curriculum and in partial fulfillment for the award of Diploma by the State Board of Technical Education and Training, Tamil Nadu. In order to encourage students to do worthwhile and innovative projects, every year prizes are awarded for the best three projects i.e. institution wise, region wise and state wise.

As far as possible, the students should be given live project problems with a view to:

- Develop understanding regarding the size and scale of operations and nature of field work in which students are going to play their role after completing the courses of study.
- Develop understanding of subject based knowledge given in the classroom in the context of its application at work places.
- Develop first and experience and confidence amongst the students to enable them to use and apply polytechnic/institute based knowledge and skills to solve practical problems of the world of work.
- Develop special skills and abilities like interpersonal skills, communication skills, attitudes and values

OBJECTIVES:

The objective of the project work is to enable the students to work in convenient groups of not more than six members in a group on a project involving theoretical and experimental studies related to Civil Engineering. Every Project Work shall have a Guide who is a member of the faculty of Civil Engineering of the college. The hours allotted for this course shall be utilized by the students to receive directions from the Guide, on library reading, laboratory work, computer analysis or field work and also to present in periodical seminars the progress made in the project. Each student shall finally produce a comprehensive report covering background information, literature Survey, problem statement, Project work details and conclusions.

This experience of project work shall help the student in expanding his / her knowledge base and also provide opportunity to utilise the creative ability and inference capability.

- Implement the theoretical and practical knowledge gained through the curriculum into an application suitable for a real practical working environment preferably in an industrial environment
- Get exposure on industrial environment and its work ethics.
- Understand what entrepreneurship is and how to become an entrepreneur.
- Learn and understand the gap between the technological knowledge acquired through curriculum and the actual industrial need and to compensate it by acquiring additional knowledge as required.
- Carry out cooperative learning through synchronous guided discussions within the class in key dates, asynchronous document sharing and discussions, as well as to prepare collaborative edition of the final project report.
- Understand the facts and importance of environmental management.
- Understand and gain knowledge about disaster management

Course Outcome

On successful completion of the course, the students will be able to attain below Course Outcome (CO):

CO	Details	BTL
1E6404-CO1	Ability to propose planning a project topic, necessity and description	**C-6**
1E6404-CO2	Ability to analyze the external loads, capacity.	**A-4**
1E6404-CO3	Ability to design the structures, discuss the results.	**C-6**

1E6404-CO4	Ability to estimate the quantity / cost of materials and labour, result Discussion, conclusion, inference and scope of the project.	E-5
1E6404-CO5	Ability to summarize the entrepreneurship and disaster management.	E-5

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

WORKS INVOLVED IN PROJECT WORK:

Collection of Data from various Journals and Civil Engineering Magazines about the list of Projects given below- Select a suitable project based on the data collected and available resources in your locality -Surveyed Site Plan — Site particulars — Preparation of Architectural Drawings – soil type in the location – Specification for materials & construction procedure - Structural design — Preparation of Detailed Estimate, Data as per Current schedule of Rates - Abstract Estimate – Structural Drawings – Preparation of Report about the project.

IMPORTANT DOCUMENTS TO BE REFERRED FOR THE ABOVE ACTIVITIES:

S.No	Activity	Reference
1.	Preparation of Architectural Drawings	Building Regulations of Locality National Building Code of India, etc
2.	Structural design, Concrete Reinforcement, Steel etc.	Relevant IS code for Masonry, Structures IS 456 for Reinforced Cement Concrete Hand book on Concrete Reinforcement and Detailing (SP-34)
3.	Specification of material and work procedure as per State Govt. Highways, Central Govt. Railways, etc	Construction procedure by organization, viz. PWD Construction procedure by organizationviz. CPWD Specification by Architect etc.,

The Project work must be reviewed twice in the same semester. The project work is approved during the V semester by the properly constituted committee with guidelines.

a) INTERNAL ASSESSMENT:

The internal assessment should be calculated based on the review of the progress of thework done by the student periodically as follows:

Details of assessment	Period of assessment	Max.Marks
First Review	6th Week	10
Second Review	12th week	10
Attendance	Entire semester	5
Total		**25**

b)   EVALUATION FOR BOARD EXAMINATION:

Details of Mark allocation	Max. Marks
Demonstration/Presentation	25
Report	25
Viva Voce	30
Internship report	20
Total	**100***

*Examination will be conducted for 100 marks and will be converted to 75 marks.

c)   Internship Report:

The internship training for a period of two weeks shall be undergone by every candidate at the end of IV / V semester during vacation. The certificate shall be produced along with the internship report for evaluation. The evaluation of internship training shall be done along with final year "Project Work & Internship" for 20 marks. The internship shall be undertaken in any industry / Government or Private certified agencies which are in social sector / Govt. Skill Centres / Institutions / Schemes.

A neatly prepared PROJECT REPORT as per the format has to be submitted by individual student during the Project Work & Internship Board examination.

LIST OF SUGGESTED PROJECTS

COMPARATIVE STUDY
- Conventional and Composite concrete mixtures Light weight construction materialsPrefabricated and R.C.C. Structures
- Cost and construction procedures for steel and R.C.C. Structures.
- Cost and Construction procedures for Prestressed and R.C.C. Structures

ADMIXTURES

Economy of using fly ash in concrete

MIX DESIGN

Comparative study of mix design by different methods

STUDY OF SPECIAL TYPES OF CONCRETE IN CONSTRUCTION BY EXPERIMENTS

- Bamboo as a reinforcing material.
- Baggage ash concrete.
- Fly ash concrete.
- Concrete with Natural vegetative materials.
- Concrete using Plastic waste.
- Concrete using Steel slag.
- Concrete using factory wastes.
- Self Compacting concrete, Fabre reinforced concrete, Ferro cements products.

PAPER PROJECTS

- Residential Houses, Primary Health center, School Buildings, Guest House.
- Panchayat Union Office Building, Bank Building.
- Post Office Building, College Building, Hospital Building, Hotel Building, Hostel Building, Factory Building, Auditorium, Shopping Centre, Community Hall, Theatre.
- Market Building, Multistoried Car park, Rural Bus Stand , Stadium.
- Swimming Pool.
- Over head tank for a village, New village road with culvert, Small Bridge.
- Plate Girder Bridge.
- Septic Tank for a Colony.
- Other Civil Engineering related structures

ENVIRONMENTAL MANAGEMENT PROJECTS

- Treatment of Wastewater and recirculation for a Colony.
- Solid waste management in a Colony.
- Hydrological data Collection for a river basin/water shed Industrial effluent Collectionand analysis .

MISCELLANEOUS

- Rain water Harvesting system for buildings.
- Rain water Harvesting system for a small colony.
- Low cost Housing techniques.
- Rehabilitation of structures

FORMAT FOR PREPARATION OF PROJECT REPORT

1. ARRANGEMENT OF CONTENTS:

The sequence in which the project report material should be arranged and bound should beas follows:

1. Cover Page & Title Page.
2. Bonafide Certificate.
3. Abstract.

4. Table of Contents.
5. List of Tables.
6. List of Figures.
7. List of Symbols, Abbreviations and Nomenclature.
8. Chapters.
9. Appendices.
10. References

The table and figures shall be introduced in the appropriate places.

2. PAGE DIMENSION AND BINDING SPECIFICATIONS:

The dimension of the project report should be in A4 size. The project report should be bound using flexible cover of the thick white art paper. The cover should be **printed in black letters** and the text for printing should be identical.

3. PREPARATION OF FORMAT:

Cover Page & Title Page – A specimen copy of the Cover page & Title page of theproject report are given in **Appendix 1.**

Bonafide Certificate – The Bonafide Certificate shall be in double line spacing using Font Style Times New Roman and Font Size 14, as per the format in **Appendix 2.**

The certificate shall carry the guide's signature and shall be followed by the guide's name, academic designation (not any other responsibilities of administrative nature), department and full address of the institution where the supervisor has guided the student. The term **'GUIDE'** must be typed in capital letters between the guide's name and academic designation.

Abstract – Abstract should be one page synopsis of the project report typed double line spacing, Font Style Times New Roman and Font Size 14.

Table of Contents – The table of contents should list all material following it as well as any material which precedes it. The title page and Bonafide Certificate will not find a place among the items listed in the Table of Contents but the page numbers of which are in lower case Roman letters. One and a half spacing should be adopted for typing the matter under this head. A specimen copy of the Table of Contents of the project report is given in **Appendix 3.**

List of Tables – The list should use exactly the same captions as they appear abovethe tables in the text. One and a half spacing should be adopted for typing the matter under this head.

List of Figures – The list should use exactly the same captions as they appear below the figures in the text. One and a half spacing should be adopted for typing thematter under this head.

List of Symbols, Abbreviations and Nomenclature — One and a half spacing should be adopted or typing the matter under this head. Standard symbols, abbreviations etc. should be used.

Chapters – The chapters may be broadly divided into 3 parts

- Introductory chapter.
- Chapters developing the main theme of the project work such as

Objectives:

- Collection of data and required survey work.
- Management and construction procedure.
- Resources scheduling and networking.
- Design details.
- Required drawing set.
- Utility to society if any and Conclusion

The main text will be divided into several chapters and each chapter may be further dividedinto several divisions and sub-divisions.

Each chapter should be given an appropriate title.

Tables and figures in a chapter should be placed in the immediate vicinity of thereference where they are cited.

Footnotes should be used sparingly. They should be typed single space and placeddirectly underneath in the very same page, which refers to the material they annotate.

Appendices – Appendices are provided to give supplementary information, which is included in the main text may serve as a distraction and cloud the central theme.

- Appendices should be numbered using Arabic numerals, e.g. Appendix 1,Appendix 2, etc.
- Appendices, Tables and References appearing in appendices should be numbered and referred to at appropriate places just as in the case of chapters.
- Appendices shall carry the title of the work reported and the same title shall be made in the contents page also.

List of References –The listing of references should be typed 4 spaces below the heading "REFERENCES" in alphabetical order in single spacing left — justified. The reference material should be listed in the alphabetical order of the first author. The name of the author/authors should be immediately followed by the year and other details.

A typical illustrative list given below relates to the citation example quoted above.

Reference:

- Code of practice for plain and reinforced concrete (fourth edition), IS456:2000, Bureauof India Standard, New Delhi.
- Neville, A. M., Concrete Technology, Fourth edition, Pearson Education, New Delhi.
- Handbook on concrete mixes (based on Indian Standards), SP: 23- 1988, Bureau ofIndian Standards, New Delhi, India

Table and figures :

By the word Table, is meant tabulated numerical data in the body of the project report as well as in the appendices. All other non- verbal materials used in the body of the project work and appendices such as charts, graphs, maps, photographs and diagrams may be designated as figures.

Typing Instructions:

The impression on the typed copies should be black in colour. One and a half spacing should be used for typing the general text. The general text shall be typed in the Font style „Times New Roman" and Font size 12

MODEL QUESTION PAPER

SESHAAYEE INSTITUTE OF TECHNOLOGY,

TRICHY -10.(Autonomous)

Model Question Paper
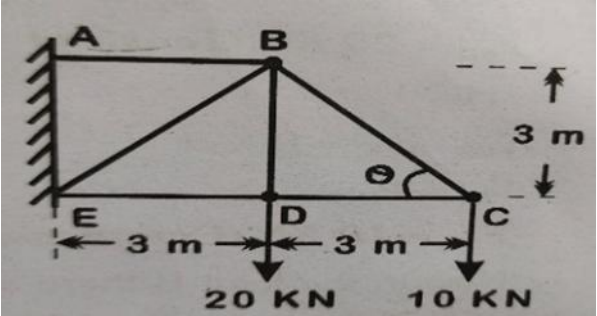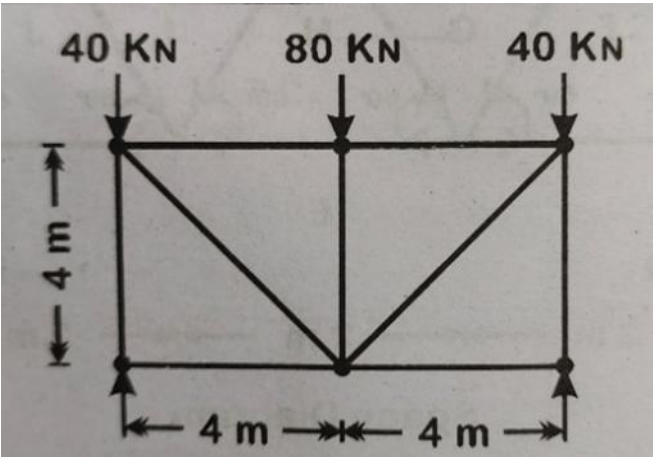
F – Scheme

Term:III Civil Engineering   Time: 3 Hours

Course: 1F3201-Mecahanics of Solids   Max. Mark: 100

PART-A (10 X 3 = 30 marks)	Bloom`s Level
Answer any TEN from the following	
1	Describe composite section.	L1(R)
2	Write the formula for calculating stresses in terms of modular ratio.	L3(A)
3	Discuss about elongation and contraction.	L2(U)
4	Explain Bending moment	L2(U)
5	Draw a neat sketch of single overhanging beam.	L3(A)
6	Classify the types of reaction.	L4(A)
7	Explain Polar Modulus.	L2(U)
8	Write the notation and unit of radius of gyration?	L3(A)
9	Explain about Centre of Gravity.	L2(U)
10	Explain Flexural Rigidity	L2(U)
11	Write down the strength equation.	L3(A)
12	Describe Bending stress distribution.	L1(R)
13	Describe truss.	L1(R)
14	Distinguish between perfect frame and imperfect frame.	L4(A)
15	Explain the method of joints in the analysis of trusses.	L2(U)

PART - B	Bloom`s Level
Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	

16	A	**(i)** Calculate the change in diameter in a short mild steel column when carries a compressive load at 800KN .The original diameter is 80mm. $E=2x105N/mm^2$, 1/m=0.3 **(7)** (ii) The diameter of a circular bar under an axial tensile load reduced from 80mm to 79.95mm. Calculate the axial load if the young's modulus of elasticity of a material is $2x10^5 N/mm^2$ and the poisson's ratio 0.3 **(7)**	L4(A)
		(or)	
	B	A square R.C.C column of 250mm size is reinforced with 4 numbersof 20mm dia steel bars. The permissible compressive stress in concrete is $4N/mm^2$. Modular ratio of steel and concrete is 18.Determine the maximum allowable load on the column. **(14)**	L3(A)
17	A	A cantilever beam 4 m long is loaded with UDL of 10KN/m for the full length of the beam, in addition to two point loads of 10KN at the free end and 15 KN at 2m from the fixed end .Draw SFD and BMD. **(14)**	L3(A)
		(or)	
	B	A cantilever of length 2m carries udl 3KN/m over the entire length, together with a point load of 10KN at the free end . Draw SFD and BMD. Calculate the Magnitude of max bending moment. **(14)**	L4(A)
18	A	**(i)** Find the centroid of the channel section 100 x 50 x 15 mm . **(7)** **(ii)** Find the centroid of the T-Section of size 10cm X 15cm x 3cm. **(7)**	L3(A)
		(or)	
	B	A built up section is formed by two T section 600 x 250 with two cover plates 500mm x 10mm are arranged as shown in figure . Find the M.I of the section about the centroidal axis properties of I section. $A= 18500mm^2$: $Ixx = 115600 x 104 mm^4$ $Iyy=5298 x 10^4 mm^4$. **(14)**	L3(A)
19	A	A timber beam of Rectangular section has to support UDL of 20KN over span of 3.6 m. If the depth of the beam is twice the width of the beam and max stress is not to exceed $70N/mm^2$ .Calculate the dimensions of the beam of B and also the gradient between the lines AB. **(14)**	L4(A)
		(or)	
	B	(i) A hollow circular shaft has outside dia as D and inside dia D/2 .If the shaft has to transmit 150KW at 150rpm with a max shear stress of 42 N/mm^2. Calculate the outer and inner diameter. . **(7)**	L5(E)

		(ii) A hollow circular shaft of 150mm outer diameter and 120mm inner diameter has the torque resisting capacity of 30KNm .Calculate the capacity of a solid shaft same cross sectional area. . **(7)**		
20	**A**	Determine the forces in all the members of the truss and indicate their nature**.** **(14)**		**L5(E)**
		(or)		
	B	Determine the magnitude and nature of forces in the members of the truss given by graphically. **(14)**		**L4(A)**

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY,

TRICHY -10.(Autonomous)

Model Question PaperF
– Scheme

Term:III Civil Engineering Time: 3 Hours

Course: 1F3202-Construction Materials and Max. Mark: 100
Construction practice

	PART-A (10 X 3 = 30 marks) Answer any TEN from the following	Bloom`s Level
1	What are the uses of stone?	L1(R)
2	What are the compositions of good brick earth?	L1(R)
3	Write a short note about storage of cement.	L3(A)
4	What are the uses of concrete?	L1(R)
5	What are the characteristics of plastics?	L3(A)
6	Explain the objectives of timber.	L2(U)
7	What are the advantages of framed structures?	L1(R)
8	What are the requirements of good partition wall?	L1(R)
9	What are the causes of dampness?	L3(A)
10	Write the purpose of ventilators.	L3(A)
11	Explain the location of stair?	L2(U)
12	Write the uses of thermal resistant.	L3(A)
13	Write the objectives of plastering?	L3(A)
14	How to prepare the surfaces of color washing.	L1(R)
15	Define scaffolding, scoring and under pinning.	L1(R)

		PART - B Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)		Bloom`s Level
16	A	Explain briefly about the physical properties of a material	(14)	L5(E)
		(or)		
	B	i) What are the classification of lime and explain it. ii) What are the functions of cement ingredients?	(7) (7)	L1(R)
17	A	Define paint. Explain the different types of paint.	(14)	L1(R)
		(or)		
	B	i) What are the defects in timber seasoning of timber? ii) Define roof coverings and objectives of roof cove ring	(7) (7)	L1(R)
18	A	i) What are the requirements of a good foundation? ii) Write short notes about load bearing structure.	(7) (7)	L1(R)
		(or)		
	B	Define grouting and explain the methods of grouting	(14)	L1(R)
19	A	Define ventilator and explain the types ventilator.	(14)	L1(R)
		(or)		
	B	What is roof and explain the types of roof	(14)	L1(R)
20	A	i) What are the defects of plastering? ii) Write the application of white wash.	(7) (7)	L3(A)
		(or)		
	B	Define anti termite treatment and explain the methods.	(14)	L4(A)

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)
Model Question Paper
F – Scheme

Term:III Civil Engineering   **Time: 3 Hours**

Course: 1F3203-Surveying   **Max. Mark: 100**

	PART-A (10 X 3 = 30 marks) **Answer any TEN from the following**	**Bloom`s Level**
1	Define true meridian and magnetic meridian.	**L1(R)**
2	Sketch a neat diagram of arrows and Ranging rod.	**L3(A)**
3	Convert WCB to RB problems (i) 156˚ 40` (ii) 289˚ 30`	**L3(A)**
4	What are the types of bench mark?	**L1(R)**
5	Sketch a neat diagram of arrows and Ranging rod.	**L3(A)**
6	Convert WCB to RB problems (i) 156˚ 40` (ii) 289˚ 30`	**L2(U)**
7	What are the types of bench mark?	**L1(R)**
8	Define datum and reduced level.	**L1(R)**
9	Write a check for height of collimation and rise & fall method.	**L3(A)**
10	What is meant by face left and face right?	**L1(R)**
11	Sketch a neat diagram of Repetition method and Reiteration method.	**L3(A)**
12	Define sounding and hydrographic surveying	**L1(R)**
13	What are the systems of tacheometer?	**L1(R)**
14	Define contour and contour gradient.	**L1(R)**
15	What are the uses of contour map?	**L1(R)**

PART - B	Bloom`s Level
Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	

16	A	(i) What are the classifications of surveying? (4) (ii) What is ranging? Describe any one method of direct ranging. (10)	L1(R)
		(or)	
	B	(i) Draw Prismatic compass with a neat sketch. (4) (ii) The bearing of the sides of a closed compass traverse ABCDA are given below Workout included angles and apply usual check. (10)	L3(A)

Line	Fore Bearing	Back Bearing
AB	N45° 30'E	S45° 30'W
BC	S60° 00'E	N60° 00'W
CD	S10° 30'W	N10° 30'E
DA	N75° 45'W	S75° 45'E

17	A	(i) Explain about Dumpy level with neat sketches . (7) (ii) Explain any seven terms used in levelling. (7)	L4(A)
		(or)	
	B	The following consecutive readings were taken with a dumpy level And a 4m levelling staff on continuously sloping ground at a common interval of 30m on A 0.585, 0.936, 1.953, 2.846, 3.644, 3.938, 0.962, 1.035, 1.689, 2.534, 3.844, 0.956, 1.579, and 3.016 on B. The elevation of A was 520.450, make up a level book and apply the usual checks (14)	L5(U)
18	A	(i) Explain about Transit theodolite with neat sketches . (10) (ii) Describe about Repetition method. (4)	L4(A)
		(or)	
	B	(i)What are the uses of hydrographic surveying? (4) (ii) Explain any three instruments needed for sounding. (10)	L3(A)
19	A	The following observation were made using a tachometer filled with analytic lens, the multiplying constant being 100.Determine the RL of	L5(U)

Staff station	WCB	Vertical angle	Staff intercept	Center hair readings	Remarks
A	40°35'	-4°30'	2.175	1.965	RL of A
B	220°35'	-05°12'	1.985	1.865	350.750m

		A and RL of B and also the gradient between the lines AB. (14)	
		(or)	
	B	(i)Explain about charctertics of Contour (10) (ii) Describe about interpolation of contour. (4)	L4(A)

20	A	i) Explain the component parts of total station. (7) ii) Explain the applications of total station. (7)	L4(A)
		(or)	
	B	i)Explain the applications of GPS receiver. (7) ii) Explain the fundamental importance of GPS. (7)	L4(A)

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	**Remember**
Level 2	**Understand**
Level 3	**Applying**
Level 4	**Analyzing**
Level 5	**Evaluating**
Level 6	**Create**

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)
Model Question Paper
F – Scheme

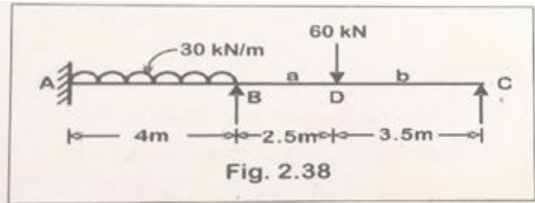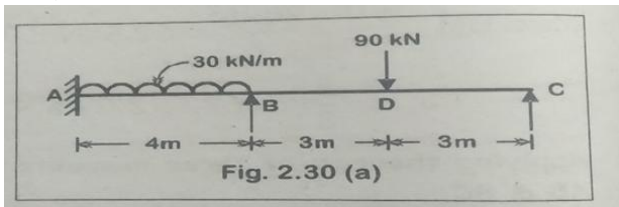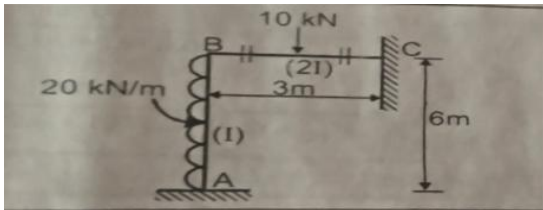**Term:IV Civil Engineering**   **Time: 3 Hours**

Course: 1F4301 THEORY OF STRUCTURES   **Max. Mark: 100**

	PART-A (10 X 3 = 30 marks) Answer any TEN from the following	oom`s Level
1	Classify the methods for analysing statically indeterminate structure	L2(U)
2	Differentiate Determinate and Indeterminate structure.	L4(A)
3	Explain sagging and hogging of beam.	L2(U)
4	What are the advantages of fixed beam over simply supported beam?	L1(R)
5	State clapeyron's theorem.	L1(R)
6	Draw the BMD, fixed BMD and final BMD for continuous beam with simply supported end.	L3(A)
7	What do you understand by the term of Relative stiffness?	L1(R)
8	Classification of sway frames.	L2(U)
9	Sketch the multi bay single storey portal frame.	L3(A)
10	Compare long column and short column.	L2(U)
11	Define the term equivalent length.	L1(R)
12	Explain core or kern of a circular and rectangular section.	L2(U)
13	Distinguish between Dams and Retaining wall.	L2(U)
14	Describe Active and passive earth pressure.	L2(U)
15	Write down the formula for max and min stress for rectangular section and explain it.	L3(A)

PART – B	Bloom`s
Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	Level

16		A	A rectangular beam of size 300mm; 400mm and 6m span is simply supports at its end. it carries a central point load of 20KN. if E= 150KN/mm2. calculate the maximum slope and deflection.	L3(A)
		(OR)	
		B	A propped cantilever of length of length 8m is carrying a point load of 40KN at a distance of 5m from the fixed end. Determine the prop reaction and draw SFD and BMD.	L3(A)

17		A	Determine the support moments for the beam shown in the figure by clapeyron's theorem of three moments. Draw the BMD. Fig. 2.38	L3(A)
		(OR)	
		B	Analyse the continuous beam as shown below by the use of clapeyron's theorem of three moments. Draw the bending moment diagram. Fig. 2.30 (a)	L4(A)

18		A	Analyse the frame with the help of moment distribution method and draw the BMD.	L4(A)
		(OR)	
		B	A propped cantilever of span 5m is subjected to an udl of 20KN/m throughout the span. Determine the fixing moment by moment area method	L3(A)

19	A	A square chimney of 20m height is constructed with 500mm thick wall in with an external dimension is 2.5m x 2.5m . The horizontal intensity of wind pressure $1.5KN/m^2$ and the specific weight of masonry is $22KN/m^3$. Calculate the maximum and minimum stress intensities at the base of the chimney.	L4(A)
		(OR)	
	B	An ISJB 150 is used as a pin ended column of 1.8m length. Calculate the safe load on the column using a factor of safety of 3. The properties of ISJB 150 are A= $901mm^2$, Ixx = 3.22 x 106 mm^4 and Iyy = 9.2 x 104 mm^4 .Take E= 2.1 x 105 N/m^2.	L4(A)
20	A	A Trapezoidal Masonry dam 4 m high 1m , wide at the top has vertical water face and retains water to its top level , Determine the bottom width required to avoid tension in the section of the dam . Density of masonry and water are $20KN/m^3$ and $9.81KN/m^3$ respectively	L3(A)
		(OR)	
	B	A trapezoidal Retaining wall of 5.5m high and 1 m wide at the top . It retains earth level with the top of wall. Calculate the minimum bottom width necessary so that no tension is induced at the base. The specific weight of masonry is $22KN/m^3$. specific weight of earth is $18KN/m^3$, It's angle of Repose soil is 30°	L4(A)

(KNOWLEDGE LEVELS)

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY,

TRICHY -10.(Autonomous)
Model Question Paper
F– Scheme

Term:IV Civil Engineering   Time: 3 Hours

Course: 1F4207-Hydraulics   Max. Mark: 100

PART-A (10 X 3 = 30 marks) Answer any TEN from the following	Bloom`s Level
1 Define: Total pressure and Centre of pressure	**L1(R)**
2 Write units and dimensions for density and specific volume	**L3(A)**
3 State different types of orifices.	**L1(R)**
4 State Bernoulli's theorem.	**L1(R)**
5 What is meant by loss of head in pipes?	**L1(R)**
6 State the practical applications of orifice.	**L1(R)**
7 What are the different types of Notches?	**L1(R)**
8 What is a spill way and state its purpose in the dam?	**L1(R)**
9 Compare V notch and Rectangular notch.	**L2(U)**
10 Define the terms : Wetted perimeter and Hydraulic mean depth	**L1(R)**
11 What are the types of channels?	**L1(R))**
12 List the advantages of lining of canals.	**L1(R)**
13 Write a short note on Jet pump	**L3(A)**
14 State the specifications of a Centrifugal pump.	**L1(R)**
15 State the functions of Foot valve and delivery valve.	**L1(R)**

		PART - B Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	Bloom`s Level
16	A	.i) A capillary tube of diameter 2.7×10^{-3}m is dipped in water. The surface tension at the contact surface is 73.5×10^{-3}N/m. If the angle of contact is 25°, determine the capillary rise. (7) ii) The pressure of water at a point in a pipe line is 5N/m^2. What is the corresponding pressure head in terms of water? What is the corresponding pressure head in terms of kerosene of specific gravity 0.8. (7)	L3(A)
		(or)	
	B	A rectangular plate 2m x 3m is immersed vertically in water such that the top 2m is parallel one to and at a depth of 1m below the free water surface. Compute the total pressure on side of the plate and depth of centre of pressure. (14)	L3(A)
17	A	i)A horizontal pipe line of 100mm diameter discharges under a pressure of 343.4×10^3Pa. The mean velocity is 1.2 m/s. Determine, a) pressure head b) velocity head and c) total head. (7) ii) A jet issuing from an orifice of 30mm diameter under a head of 2m falls 1m vertically in a horizontal distance of 2.75m from the vena contracta. The actual discharge is 100 litres in 37 seconds. Calculate a. coefficient of discharge, b. coefficient of velocity and c. coefficient of contraction. (7)	L3(A)
		(or)	

	B	Water flows through a 150mm diameter and 50m long pipe with a velocity of 3m/s. calculate the loss of head by using
		    i)Darcy"s formula, taking friction factor as 0.02.
		    ii)Chezy"s formula, taking Chezy"s constant as 60. (14)
			L3(A)

18	A	A trapezoidal notch is 1.5m wide at the top and 0.7m at the bed. The height is 0.4m. Determine the discharge through the notch when the head of water is 0.30m. Take Cd as 0.62 (14)	L3(A)
		(or)	
	B	i)A weir, 10m long is divided into 4 bays by vertical posts, each 300mm wide. Determine the discharge if the head of water over the weir is 1m. Take Cd as 0.60. (7) ii) Determine the discharge over a sharp crested weir of length 20m under a constant head of 0.10m. Take Cd as 0.60 (7)	L3(A)
	A	i) Calculate the hydraulic mean depth for a rectangular channel having a bottom width of 2 m, and depth of flow 1.75m. (7) ii)Design an economical rectangular channel to carry 90m3/s with a bed fall of 1 in 1500. In the Chezy"s formula C=50 (7)	L6(C)
		(or)	

19	B	A rectangular channel has an economical section. The maximum discharge through the channel is 75 m^3/s. The bed fall is 1 in 1600. Compute the dimensions of the channel. Take C = 50. (14)	L3(A)
	A	A single acting reciprocating pump has a piston diameter of 300mm and stroke of 200mm. The speed of the pump is 30 r.p.m. and it delivers 6.5 lps. Calculate the Cd and %Slip. (14)	L3(A)
		(or)	
	B	(i)Explain the different types of heads for a centrifugal pump? (7) (ii)A centrifugal pump, installed in a well for irrigation, pumps 2400 litres of water per minute to a height of 25m through 120m long and 150mm diameter pipe. The overall efficiency of the pump is 60%. Taking friction factor as 0.04, calculate the power required to drive the pump (7)	L3(A)

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)
Model Question Paper
F – Scheme

Term: IV Civil Engineering   **Time: 3 Hours**

Course: 1F4302- Transportation Engineering   **Max. Mark: 100**

	PART-A (10 X 3 = 30 marks) **Answer any TEN from the following**	**Bloom's Level**
1	Define demand.	L1(R)
2	Define Pipe Corrosion	L1(R)
3	Define Garbage.	L1(R)
4	Define Chlorination.	L1(R)
5	What are the shapes of Sewers?	L1(R)
6	Write any two types of Filters.	L3(A)
7	What are the Classifications of Solid Waste?	L1(R)
8	Define Acid Rain.	L1(R)
9	Write any three Physical &Chemical Parameters.	L3(A)
10	Define Infiltration Gallery & Infiltration Well?	L1(R)
11	Define Water Softening. Write any Three Methods of Water Softening	L1(R)
12	Explain about Lamp Hole with neat Sketch.	L3(A)
13	What is meant by Oxidation Pond?	L1(R)
14	What is the necessity of disposal of solid waste?	L1(R)
15	Explain about Green House Effect.	L3(A)

		PART-B (5x14 =70 marks) Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	Bloom's Level
16	**A**	Explain briefly the different types of sight distance with neat sketches. (14)	**L2(U)**
		(OR)	
	B	Explain the different types of Road gradient. (14)	**L3(A)**
17	**A**	Explain in detail about the laying of Water Bound Macadam Road with neat sketch. (14)	**L4(A)**
		(OR)	
	B	I. What are the factors affecting Highway Alignment. (7) II. What are the advantages and disadvantages of Bituminous Roads? (7)	**L2(U)**
18	**A**	Explain the PQRS method of relaying with neat sketch. (14)	**L3(A)**
		(OR)	
	B	(i) Justify the importance of having uniformity in gauges (7) (ii) What are the requirements of an ideal ballast? (7)	**L3(A)**
19	**A**	How railway stations are classified according to functions? Explain them in detail. (14)	**L4(A)**
		(OR)	
	B	(i) What are the principles of Interlocking?. (7) (ii) Explain with sketch the functions of derailing switch (7)	**L3(A)**
20	**A**	Explain with a neat sketch of balanced cantilever bridge (14)	**L3(A)**
		(OR)	
	B	(i) What are the factors to be considered in bridge alignment? (7) (ii) What are the various types of Abutment? (7)	**L4(A)**

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)
Model Question Paper
F – Scheme

Term:V Civil Engineering   Time: 3 Hours

Course: 1F5306-Structural Engineering   Max. Mark: 100

	PART-A (10 X 3 = 30 marks) Answer any TEN from the following	Bloom`s Level
1	Define the terms: characteristic strength and design strength.	L1(R)
2	Explain the use of partial safety factors in the limit state method of design.	L1(R)
3	What are the different grades of steel used for reinforced concrete structures?	L1(R)
4	Explain how the effective width of flange is determined for T and L- beams.	L2(U)
5	What are the advantages and disadvantages of inclined stirrups over vertical stirrups	L2(U)
6	Explain how the effective span is calculated in continuous beams.	L1(R)
7	List out any two requirements of stairs	L1(R)
8	Specify the I.S. code provisions regarding one way slabs(a) minimum area of main reinforcement, (b) maximum size and spacing of main reinforcement bars,	L1(R)
9	What is meant by curtailment of tension reinforcement?	L1(R)
10	What is meant by slenderness ratio of a column?	L1(R)
11	What are the basic requirements of a column footing?	L3(A)
12	What is meant by punching shear?	L1(R)
13	List out the advantages and dis advantages of welded connections	L2(U)
14	What is meant by stress reduction factor?	L1(R)
15	Define gross area and net area of tension member	L1(R)

PART - B	Bloom`s Level
Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	

16	**A**	A singly reinforced beam of size 230 mm x 600 mm effective size is reinforced with three numbers of 20 mm diameter bars in the tension zone. Determine the moment of resistance of the section at the limit state of colla Use M20 grade concrete and fe415 steel	L5(E)
		(or)	
	B	sign a doubly reinforced rectangular simply supported beam at its both ends to carry a live load of 30kN/m and dead load of 18kN/m over a clear span of 6.2 metre. The width and overall depth of beam are kept as 360 mm and 600 mm respectively. Assume 25mm clear cover.Use M20 concrete and Fe250 steel.	L6(C)
17	**A**	Design a RC lintel for an opening of 1.5 m width on masonry wall of 230mm width using M15 concrete and mild steel. The height of wall above the opening is 1.8m.Assume a bearing of 200 mm on either side.	L6(C)
		(or)	
	B	A RC beam has an effective size of 250 mm x 550 mm.It is subjected to a total working load including self-weight of 30 kN/m on a span of 6m. It is provided with 4 numbers of 22 mm dia bars in tension at support. Design the shear reinforcement M20 concrete is used. Adopt fe250 Steel	L6(C)
18	**A**	Design a simply supported RCC slab to cover a room of 3mx 8m with wall thickness of 300mm.Assume M20 concrete and Fe415 steel are used and the total load including self-weight of slab is 5.5 kN/m^2 .Design for depth and main reinforcement only	L6(C)
		(or)	
	B	The vertical height between the successive floors of a multi story residential building is 3 m. The clear size of the stair case room is 2.1 m x 4.25 m plan a dog – legged stair case for the building and show the arrangement with a neat sketch	L6(C)
19	**A**	A RC column 250 mmx 250 mm size has 4 mild steel bars of 16 mm diameter, one at each corner.The effective length of the column is 2.75m.The concrete is of M20 grade Determine the strength of column at limit state of collapse.	L5(E)
		(or)	
	B	An isolated footing of uniform thickness has to be provided for a square column of 400 mmx400 mm size carries characteristic load of 1200kN.The safe bearing capacity of soil is 150 kN/m^2.Design the footing for flexure only.(check for shear and bearing is not necessary) use M20 grade concrete and mild steel reinforcement.	L6(C)
20	**A**	Design a single angle tension member to carry a tensile force of 250 kN due to dead load and live load.The angle is to be connected to a gusset plate through one of its leg by fillet weld fy= 250 N/mm2 ,fu=410 N/mm2	L6(C)

		.Connection need not be designed	
		(or)	
	B	Design a steel column using symmetrical section to carry an axial load of 1000kN.The column is 3.6m long and fixed at both ends.Take fy=250 Mpa.	**L6(C)**

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.
(Autonomous)
Model Question Paper
F – Scheme

Term: V Civil Engineering   **Time: 3 Hours**

Course: 1F5307- Environmental Engineering   **Max. Mark: 100**

	PART-A (10 X 3 = 30 marks) Answer any TEN from the following	Bloom's Level
1	Define demand.	L1(R)
2	Define Pipe Corrosion	L1(R)
3	Define Garbage.	L1(R)
4	Define Chlorination.	L1(R)
5	What are the shapes of Sewers?	L1(R)
6	Write any two types of Filters.	L3(A)
7	What are the Classifications of Solid Waste?	L1(R)
8	Define Acid Rain.	L1(R)
9	Write any three Physical &Chemical Parameters.	L3(U)
10	Define Infiltration Gallery & Infiltration Well?	L1(R)
11	Define Water Softening. Write any Three Methods of Water Softening	L1(R)
12	Explain about Lamp Hole with neat Sketch.	L3(A)
13	What is meant by Oxidation Pond?	L1(R)
14	What is the necessity of disposal of solid waste?	L1(R)
15	Explain about Green House Effect.	L3(A)

		PART-B (5x14 =70 marks) Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	Bloom's Level
16	A	Explain briefly about the Construction & working Principles of Rapid Sand Filter with neat Sketch.sketches. (14)	L2(U)
		(OR)	
	B	I. Define Intake. What are the types of Intake? (7) II. Explain with neat sketch Canal Intake. (7)	L3(A)
17	A	Compare Slow sand filter with Rapid sand filter.. (14)	L-4(A)
		(OR)	
	B	Explain briefly about the methods of water distribution system with neat sketch. (14)	L2(U)
18	A	Define Ventilation of sewer & state its necessity. Explain the various methods of ventilation of sewers. (14)	L-3(A)
		(OR)	
	B	Write short notes on (i) Street Inlet (ii) Grease & Oil trap (iii)Flushing Tank. (14)	L3(A)
19	A	Explain the construction and working of septic tanks with Suitable methods of disposal of effluent (14)	L4(A)
		(OR)	
	B	Explain briefly about Solid waste disposal (14)	L3(A)
20	A	Write short notes on sources of soil pollution (14)	L3(A)
		(OR)	
	B	Draw the flow chart of methodology of EIA and explain it. (14)	L4(A)

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)
Model Question Paper
F – Scheme

Term: V Civil Engineering   **Time: 3 Hours**

Course: 1F5308.1 Remote Sensing and Geoinformatics   **Max. Mark: 100**

	PART-A (10 X 3 = 30 marks) Answer any TEN from the following	Bloom`s Level
1	What are the types of orbit?	L1(R)
2	Describe EMR.	L2(U)
3	What are the components of remote sensing?	L1(R)
4	What are the Stereoscopic plotting instruments?	L1(R)
5	Explain vertical photograph.	L2(U)
6	Describe Flight planning.	L2(U)
7	What is meant by photo interpretation?	L1(R)
8	What is image classification?	L1(R)
9	What are the applications of remote sensing?	L1(R)
10	Write short notes on DBMS.	L3(A)
11	Describe hardware.	L2(U)
12	What are the types of data?	L1(R)
13	Define raster data and vector data.	L1(R)
14	Write short notes on mapping concepts.	L3(A)
15	What is meant by hydrology?	L1(R)

		PART - B Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)		Bloom`s Level
16	**A**	i) Explain about principles of Radiation. (7) ii) Explain characteristic of real remote sensing system (7)		**L3(A)**
		(or)		
	B	i) Describe about typical spectral reflective characteristics of water. (7) ii) Explain about the electromagnetic radiation. (7)		**L2(U)**
17	**A**	i) Explain Geometric elements of a vertical photograph. (10) ii) Explain any onr Stereoscopic plotting instruments. (4)		**L3(A)**
		(or)		
	B	i) Describe about the Ortho photos. (4) ii) Explain about Flight planning (10)		**L2(U)**
18	**A**	i) Explain about the concepts of digital image processing image Rectification (7) ii) Explain about the Elements of image interpretation. (7)		**L4(A)**
		(or)		
	B	i) What are the Elements of image interpretation? (7) ii) Explain about the Image enhancement. (7)		**L2(U)**
19	**A**	i) Explain about the History of development of GIS (7) ii) Explain about the components of GIS. (7)		**L4(A)**
		(or)		
	B	i) What are the types of attributes? (4) ii) Explain about the Basic Concepts of GIS. (10)		**L1 (R)**
20	**A**	i) Explain the data input by digitization and scanning. (7) ii) What are the Errors and quality control in GIS? (7)		**L2(U)**
		(or)		
	B	i) Explain the Land Information System. (7) ii) Explain the Various GIS applications in Civil Engineering. (7)		**L3(A)**

**BLOOM'STAXONOMY (KNOWLEDGE
LEVELS)**

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)
Model Question Paper
F – Scheme

Term:V Civil Engineering   **Time: 3 Hours**
Course: -1F5308.2 Concrete Technology   **Max. Mark: 100**

	PART-A (10 X 3 = 30 marks) Answer any TEN from the following	Bloom`s Level
1	What are the compositions of cement?	L1(R)
2	What are the types of sand based on grain size?	L1(R)
3	Specify the various tests on fresh concrete.	L1(R)
4	What is super plasticizer?	L1(R)
5	What is Mix design?	L1(R)
6	What are the functions of admixtures?	L1(R)
7	What is polymer concrete?	L1(R)
8	What is Guniting?	L1(R)
9	What is light weight concrete?	L1(R)
10	What are the advantages of prestressed concrete?	L1(R)
11	What is tendon?	L1(R)
12	Name the materials used for form work.	L1(R)
13	What are the types of crack in concrete?	L1(R)
14	What are the types of joints in concrete?	L1(R)
15	What are the methods of repairing concrete works?	L1(R)

		PART - B Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	Bloom`s Level
16	A	Briefly explain the following (i)Properties of concrete (ii)Production of concrete	L2(U)
		(or)	
	B	Write the classification of coarse aggregate?Explain the properties of coase aggregate	L2(U)
17	A	Explain the following (i)Retarders (II)Accelerators (iii)Air entraining admixtures	L2(U)
		(or)	
	B	Describe the mix design procedure by I.S. Code method.	L2(U)
18	A	Explain the following (i)Polymer concrete (ii) Fibre reinforced concrete	L2(U)
		(or)	
	B	Explain the Characteristics of light weight concrete and various applications of light concrete.	L2(U)
19	A	What are the methods of prestressing? Explain any two of them	L2(U)
		(or)	
	B	What are the Requirements of formwork?Explain	L1 (R)
20	A	Explain in detail the various joints in concrete.	L2(U)
		(or)	
	B	Describe assessment of cracks and its preventive measures	L2(U)

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)
Model Question Paper
F – Scheme

Term: V Civil Engineering   **Time: 3 Hours**
Course: 1F5308.3 GEOTECHNICAL ENGINEERING   **Max. Mark: 100**

	PART-A (10 X 3 = 30 marks) Answer any TEN from the following	oom`s Level
1	What are the factors affecting permeability?	L1(R)
2	Differentiate unit weight and density of soil.	L4(A)
3	Define Degree of saturation.	L1(R)
4	State Mohr"s Columb failure theory.	L1(R)
5	Name the systems of soil classification.	L1(R)
6	What are the types of samples and samplers?	L1(R)
7	Write any three properties of flow net.	L1(R)
8	What are the types of failure in a soil?	L1(R)
9	Define bearing capacity of soil. Write the formula to find bearing capacity.	L1(R)
10	Explain about under reamed pile foundation with neat sketch.	L2(U)
11	Explain free swell test.	L2(U)
12	Write the uses of pile foundation.	L3(A)
13	Define soil dynamic.	L1(R)
14	What is machine foundation?	L1(R)
15	Write any three necessity of tower foundation.	L3(A)

		PART – B Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	Bloom`s Level
16	A	i.) Explain : Liquidity index and Plasticity index. (7) ii.) Explain the liquid limit test on soil with neat sketch. (7)	L3(A)
		(OR)	
	B	Explain how the plastic limit of soil is determined in the laboratory. (7) Explain in detail the factors affecting the permeability of soil. (7)	L4(A)
17	A	Compare compaction and consolidation of soil. (7)	
		Explain with neat sketch the standard Proctor"s compaction test to determine the density of soil. (7)	L2(U)
		(OR)	
	B	Write short notes on disturbed and undisturbed soil samples. (7) Explain with neat sketch any one type of geophysical method of soil exploration. (7)	L3(A)
18	A	i.) State the different properties of flow nets. (7)	L1(R)
		ii.) Explain how the uplift pressure and exit gradient are calculated by using Khosla"s theory. (7)	L4(A)
		(OR)	
	B	i.) What are the factors affecting the bearing capacity of soil? (7) ii.) What are the assumptions and limitations of Terzaghi"s analysis on bearing capacity of soil? (7)	L1(R)
19	A	i.) Explain with neat sketch the negative skin friction (7) ii) Explain how the pile load test is carried out to determine the bearing capacity of piles. (7)	L4(A)
		(OR)	
	B	i.) Explain how the expansive soils are identified. (7) ii.) Explain with neat sketch about the under reamed pile foundation. (7)	L3(A)
20	A	i.) What are the general requirements for machine foundations? (7)	L1(R)
		ii.) Briefly describe the resonance method and wave velocity method for dynamic investigation of soil at the site. (7)	L4(A)
		(OR)	

	B	i.) Give the necessary information required for the design and construction of transmission line tower foundation. (7)	L6(C)
		ii.) Explain how is the safety of a tower foundation checked against Uplift and overturning. (7)	L3(A)

(KNOWLEDGE LEVELS)

Levels	Category
Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)
Model Question Paper
F – Scheme

Term: VI Civil Engineering   **Time: 3 Hours**

Course: 1F6311 Construct Management   **Max. Mark: 100**

	PART-A (10 X 3 = 30 marks) Answer any TEN from the following	Bloom`s Level
1	What are the objectives of construction management?	L1(R)
2	Define land acquisitions and technical sanction.	L1(R)
3	Write a short note about tender notice.	L3(A)
4	What are the advantages of sole proprietorship?	L1(R)
5	What is decentralization?	L1(R)
6	Write the importance's of M.Book?	L3(A)
7	What are the uses of scheduling?	L1(R)
8	What are the networks for projects management?	L1(R)
9	What are the methods of crashing?	L1(R)
10	Describe the importances of quality.	L2(U)
11	What are the modes of settlements?	L1(R)
12	Write about the payment of wages act.	L3(A)
13	What is the significance of entrepreneurship?	L1(R)
14	What are the uses of computer in construction industry?	L1(R)
15	What are the elements of cash flow?	L1(R)

PART - B Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)			Bloom`s Level
16	**A**	What are the duties and responsibilities of a chief engineer (14)	**L1(R)**
		(or)	
	B	(i) Define contract and explain the types of contract. (7) (ii) Explain the earnest money deposit. (7)	**L3(A)**
17	**A**	What are the forms of business organization and explain it briefly. (14)	**L1(R)**
		(or)	
	B	Explain the accounting procedure for administrative sanction and technical sanction (14)	**L4(A)**
18	**A**	Define scheduling and what are the methods of scheduling? (14)	**L1(R)**
		(or)	
	B	Explain about the labour management in construction. (14)	**L3(A)**
19	**A**	Define accident and explain the causes of accident. (14)	**L4(A)**
		(or)	
	B	(i)Write about the employment provident fund. (7) (ii)Write about the engineering ethics (7)	**L1 (R)**
20	**A**	Explain briefly about the construction automation and robotics (14)	**L1(R)**
		(or)	
	B	Define bank and explain the types of bank. (14)	**L3(A)**

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	**Remember**
Level 2	**Understand**
Level 3	**Applying**
Level 4	**Analyzing**
Level 5	**Evaluating**
Level 6	**Create**

SESHASAYEE INSTITUTE OF TECHNOLOGY (AUTONOMOUS) ,
TRICHY – 620 010
MODEL QUESTION PAPER

PROGRAMM : CIVIL   YEAR/TERM:III/VI
TIME   : 3 HOURS   MAX.MARKS:75
COURSE CODE & NAME**:** 1F6209- ESTIMATION, COSTING AND VALUATION

	PART-A (10 X 3 = 30 marks) Answer any TEN from the following	Bloom`s Level
1	Define painting coefficient.	L1(R)
2.	Define out turn of work.	L1(R)
3.	Define:Specification	L1(R)
4.	What do you mean by observed data?	L1(R)
5.	What is meant by standard data book?	L1(R)
6.	Define:Lumpsum provisions	L1(R)
7.	What is regular and irregular areas?	L1(R)
8.	Define an Embankment	L1(R)
9.	What are two level sections?	L1(R)
10.	What are the duties of a Quantity surveyor?	L1(R)
11.	What is group system?	L1(R)
12.	Differentiate centre line method from individual wall method	L4(A)
13.	Define:Depreciation	L1(R)
14.	What is Fair rent?	L1(R)
15.	Define the term "salvage value"	L1(R)
	PART-B **Answer all questions choosing either (a) or (b) from each questions** **5x14=70**	
16	(a). Write a standard specification for brick work in cm1:5 **(OR)**	L3(A)
	(b) Write the technical report for construction of a school building	
17.	(a) **Analyse and find out the rate for surface dressing one coat with the given details-Rate per m^2** *Material requirement-100 m^2* Bitumen -2 Kg/ m^2 of surface area Stone chipping(12mm) -1.6 m^3/100 m^2 *Labour and Machinery requirement* Mazdoor I -0.5/100 m^2 Mazdoor II -6.67/100 m^2 Sprayer -0.1 No./100 m^2 Roller -0.1 day/100 m^2 Tar sprayer -0.1 day/100 m^2	L4(A)

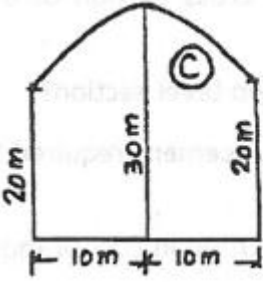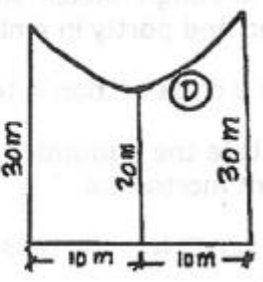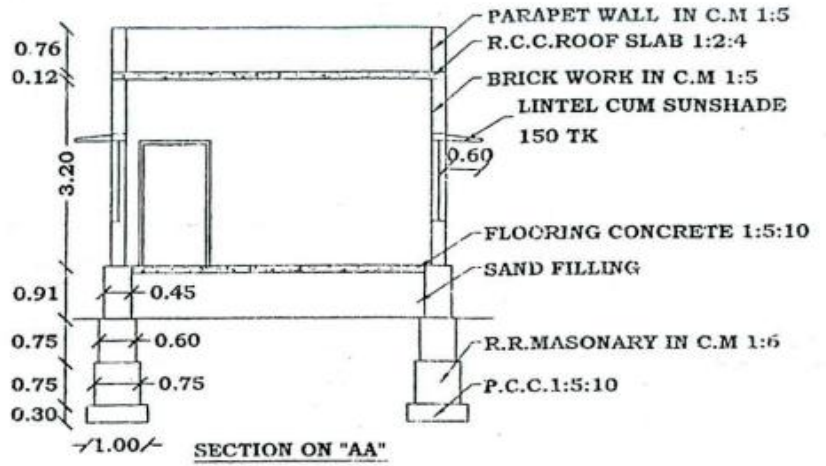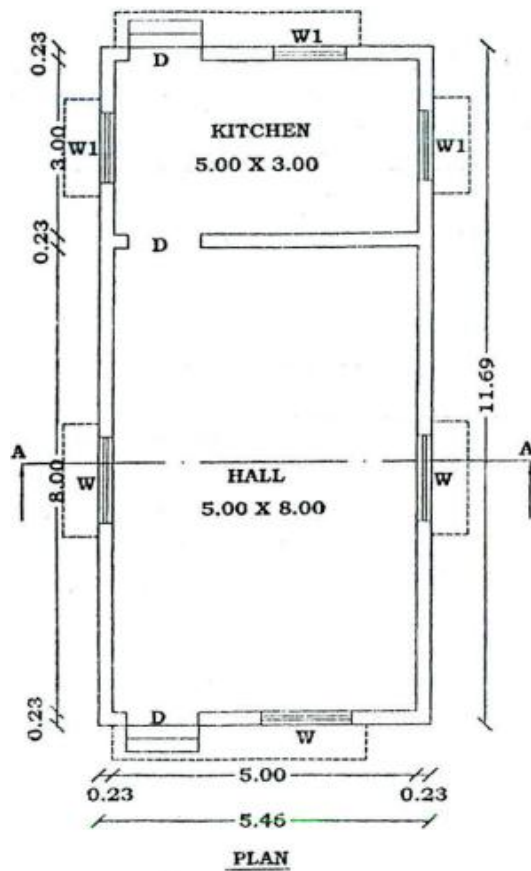|			
	Cost of materials and labour Bitumen emulsion -Rs.44/Kg Stone chipping 12mm –Rs.1200/ m^3 Hire charges for roller –Rs.1800/day Cost of brushes,broom,etc-LS-Rs.240 Mazdoor I –Rs.700/each/day Mazdoor II –Rs.500/each/day Sprayer -Rs.550/each/day Overhead charges -10% of the total cost **(OR)**	
	(b) **Analyse and determine the rate for providing and fixing a stainless steel wash basin 405x305 mm with single 15mm cp brass pillar tap- 1 No.** *Materials and labour required-1 No.* Salem stainless steel AISI- 304 round Wash basin 405mm x305mm -1 NO. 15mm CP brass pillar tap -1 no. 32mm dia C.P brass washer -1 no. MS brackets -1 pair Lead,Gasket,cement,sand,etc-LS-Rs.250 Fitter I class -0.3 no. Mason I class -0.3 no Mazdoor I class -0.6 no Add 10% for over head expenses and contractor's profit *Cost of materials and labour* Salem stainless steel AISI 304 Round wash basin 405mm x355 mm -Rs.1900 each 15mm CP brass pillar tap -Rs.450 each 32mm dia brass washer -Rs.110 each MS brackets –Rs.95/pair Fitter I class -Rs.650 each Mason I class –Rs.700 each Mazdoor I class –Rs.450 each	
18	(a)Compute the area of the two figures C and D given below by (i)Average ordinate rule (ii)Trazoidal rule (iii)Simpson's rule	L3(A)

(OR)

(b)A waste water dispersion trench has been excavated in a level ground for a depth of 2.0m.The size of trench is 6m x12m at bottom.The side slopes of the trench are 1:1 on all the four sides.calculate the volume of earth work by (i)Prismoidal rule (ii)Average area rule.

19	(a)Take out the quantities of the following works for a small residential building given in Fig:A using trade system (i)RR masonry with CM 1:6 for footings and basement.((5) (ii)Earth work work excavation for foundation(5) (iii)RCC roof slab (4) **(OR)**	L5(E)
	(b)Take out the quantities of the following works for a RCC slab culvert given in Fig:B using trade system (i)Earth excavation in foundations(5) (ii)Brick work in cm1:4(5) (iii)RCC 1:2:4 for slab(4)	
20	(a) A owner occupied property is required to be valued for the wealth tax purpose on land and buildings.The following particulars are available.Find the present value of the property. Value of the land Rs.5,50,000 Cost of building Rs.15,00,000 Age of the building 40 years Estimated cost of repairs Rs.60,000 Depreciation to be allowed 0.8% per annum **(OR)**	L3(A)
	(b) Calculate the fair rent for a building to be used for residential purposes from the following data Cost of building at the present market rate Rs.4,50,000 Age of the building 20 years Materials used RCC and teak wood Area of the plot : 200m^2 Cost of land Rs.1500/ m^2 Sanitary, water supply amenities and electrical fittings Rs.50, 000	

FIG:A(RESIDENTIAL BUILDING)

KITCHEN
5.00 X 3.00

HALL
5.00 X 8.00

W1
D
0.23
3.00
W1
0.23
11.69
A — A
8.00
W
W
0.23
D
W
5.00
0.23
0.23
5.46

PLAN

SECTION ON "AA"

0.76
0.12
3.20
0.91
0.45
0.75
0.60
0.75
0.75
0.30
1.00

PARAPET WALL IN C.M 1:5
R.C.C.ROOF SLAB 1:2:4
BRICK WORK IN C.M 1:5
LINTEL CUM SUNSHADE
150 TK
0.60
FLOORING CONCRETE 1:5:10
SAND FILLING
R.R.MASONARY IN C.M 1:6
P.C.C.1:5:10

REFERENCE		
D	DOOR	1.20 X 2.10
W	WINDOW	1.50 X 1.40
W1	WINDOW	1.20 X 1.40

FIG:B(SLAB CULVERT)
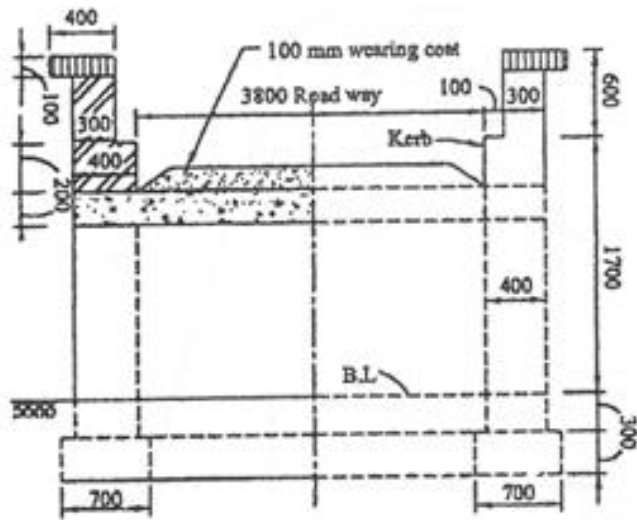
Half longitudinal section on CBEF
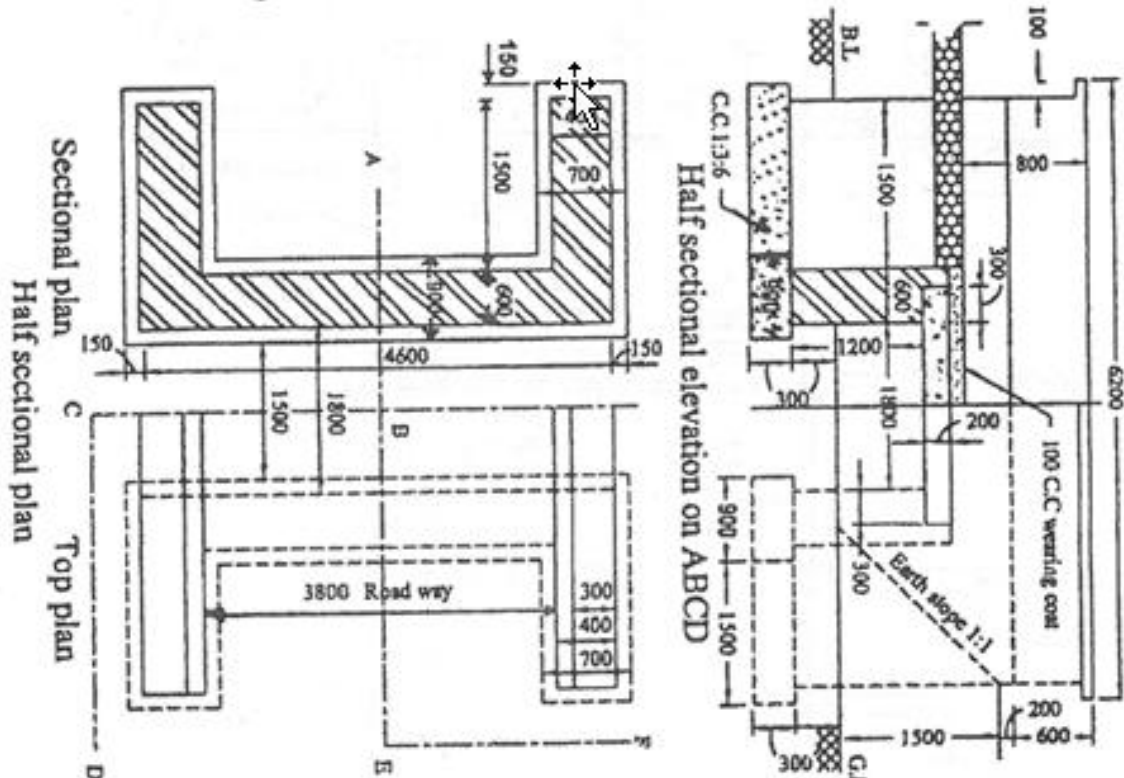
Sectional plan
Half sectional plan

Top plan

Half sectional elevation on ABCD

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.
(Autonomous)
Model Question Paper
F – Scheme

Term: VI Civil Engineering   **Time: 3 Hours**

Course: 1F6312.1- Sustainable and Green Building   **Max. Mark: 100**

PART-A (10 X 3 = 30 marks) Answer any TEN from the following		Bloom`s Level
1	What is meant by Energy efficiency?	L1(R)
2	Explain about advanced passive heating and cooling	L2(U)
3	Explain the methods of indoor air quality.	L2(U)
4	What is meant by Energy Audit?	L3(A)
5	State the regulations of EIA.	L1(R)
6	Explain the environmental clearance for civil engineering	L2(U)
7	Explain how hydro energy is produced.	L2(U)
8	What are the chemical sources of energy?	L1(R)
9	Explain about energy efficiency.	L2(U)
10	Explain any two green building material and their use in construction	L2(U)
11	Explain how bio fuels are prepared	L2(U)
12	Write few lines about green building.	L3(A)
13	Write about LEED criteria.	L3(A)
14	What is the role of Energy efficiency?	L1(R)
15	State the role of NPC in building entrepreneurs.	L1(R)

PART - B			Bloom`s Level
16	A	i. What are the benefits of Green Building? **(7)** ii. Write about Indoor Air Quality in buildings. **(7)**	L3(A)
		(or)	
	B	i. Brief explain about Site selection strategies. **(7)** ii. Briefly explain about passive heating and cooling techniques duringconstruction . **(7)**	L2(U)
17	A	Explain the necessity, procedures and types of energy ManaementPrograms. **(14)**	L4(A)

		(or)	
	B	i. Explain the benefits and limitations of EIA. **(7)** ii. Write short notes on Environmental Clearance for projects**. (7)**	**L5(E)**
18	**A**	i. What are the different forms of Renewable energy? **(7)** ii. Compare and contrast Renewable and Non renewable energysources. **(7)**	**L4(A)**
		(or)	
	B	**i.** Explain the need of energy conservation. (7) **ii.** Briefly explain about LEED India rating system. (7)	**L5(E)**
19	**A**	i. Explain the salient features of Green Building. **(7)** ii. Explain the environmental design strategies for building construction. **(7)**	**L4(A)**
		(or)	
	B	i. Explain in detail about the reuse of waste materials. **(7)** ii. Write about modular kitchens and bathrooms. **(7)**	**L3(A)**
20	**A**	Explain in detail the functions of Government organization working forEnergy conservation and Audit. **(14)**	**L3(A)**
		(or)	
	B	i. What is meant by MNRE and State its functions? **(7)** ii. Write about National Productivity Council and Building Energy Rating **(7)**	**L1(R)**

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

Levels	Category
Level 1	**Remember**
Level 2	**Understand**
Level 3	**Applying**
Level 4	**Analyzing**
Level 5	**Evaluating**
Level 6	**Create**

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)

Model Question Paper

F – Scheme

Term: VI Civil Engineering   **Time: 3 Hours**

Course: 1F6312.2 URBAN PLANNING AND DEVELOPMENT   **Max. Mark: 100**

PART-A (10 X 3 = 30 marks) Answer any TEN from the following	Bloom`s Level
1 What is meant by zoning and state its importance?	L1(R)
2 What are the requirements of New towns?	L1(R)
3 Write the types of surveys for planning a town.	L3(A)
4 Define "HUDCO" and CIDCO.	L1(R)
5 What are the classifications of a residential building?	L1(R)
6 What are the problems faced in clearing a slum?	L1(R)
7 Define "Green House".	L1(R)
8 What are the methods of execution in Master plan?	L1(R)
9 What are the objectives of re-planning?	L1(R)
10 What are the advantages and disadvantages of Automatic light signals?	L1(R)
11 What are the traffic problems in an existing town?	L1(R)
12 Classification of urban roads.	L4(A)
13 Define floor space Index(FSI).	L1(R)
14 What are the general rules of metropolitan area?	L1(R)
15 Write notes on light plane.	L3(A)

		PART – B Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)	Bloom`s Level
16	**A**	I. What are the principles of town planning? Explain them briefly. (7) II. What are the objects of zoning? Explain the advantages of zoning (7)	L3(A)
		(OR)	
	B	i.) Discuss the growth of towns according to origin. (7) ii.) Distinguish natural growth and planned growth. (7)	L3(A)
17	**A**	i.) What are the classifications of Residential Buildings? (7) ii.) Briefly explain about housing problems in India , (7)	L3(A)
		(OR)	
	B	i.) What are the effects of Slums? (7) ii.) Write short notes on Resources for Slum clearance program (7)	L3(A)
18	**A**	iii.) What are the classifications of Public Buildings? (7) iv.) What are the necessities of Open spaces? (7)	L3(A)
		(OR)	
	B	i.) What is a master plan? What are the objects of master plan? (7) ii.) State the data to be collected for Replanning of a town. (7)	L3(A)

19	**A**	i) Write short notes on
		  a) Arterial road
		  b) Rectangular street system (7)
		
		iii) Write about Road aesthetics. (7)
			L3(A)

		(OR)	
	B	iii.) Briefly explain about Road Traffic Problem. (7) iv.) Write about Street Lighting in a town. (7)	L3(A)

20	A	iii.) Write about
		    a) importance of Bye laws
		      b)What are Principles underlying in framing building bye-laws (7)
		    iv.) Write about Buildings Development Control Rules. (7)
			L3(A)

		(OR)	
	B	Explain in detail about Remote sensing applications in Urban Planning. (14)	L4(A)

(KNOWLEDGE LEVELS)

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Level 1	Remember
Level 2	Understand
Level 3	Applying
Level 4	Analyzing
Level 5	Evaluating
Level 6	Create

SESHASAYEE INSTITUTE OF TECHNOLOGY, TRICHY -10.

(Autonomous)
Model Question Paper
F – Scheme

Term: VI Civil Engineering   **Time: 3 Hours**

Course: 1F6312.3 Water Resources Engineering   **Max. Mark: 100**

PART-A (10 X 3 = 30 marks) Answer any TEN from the following		Bloom`s Level
1	What is the purpose of water resources?	L1(R)
2	What is the application of hydrology?	L1(R)
3	What are the uses of unit hydrograph?	L1(R)
4	What are the zones of groundwater?	L1(R)
5	Define the term porosity and permeability.	L1(R)
6	Describe salt balance.	L2(U)
7	What are the classifications of river training?	L1(R)
8	What are the purposes of storage reservoir?	L1(R)
9	Define spillway and explain the types of spillway.	L1(R)
10	What is the necessity of lining of canal?	L1(R)
11	What is the need for crop rotation?	L1(R)
12	Write about the irrigation scheduling	L3(A)
13	Write the classification of water sheds.	L3(A)
14	What are the effects of soil erosion?	L1(R)
15	Explain onsite detention basin.	L3(A)

PART - B Answer all questions from 16 to 20 either(A) or (B) (5x14 =70)			Bloom`s Level
16	A	Define hydrological cycle and explain it briefly. (14)	L3(A)
		(or)	
	B	Define rain gauge and explain the types of rain gauge. (14)	L3(A)
17	A	Define ground water exploration and explain the methods of ground water exploration. (14)	L3(A)

		(or)		
	B	Explain briefly about the artificial recharge of ground water.	(14)	L4(A)
18	A	(i)What are the major rivers in Tamil Nadu? (ii)What are the objectives of river training works?	(7) (7)	L1(R)
		(or)		
	B	Explain the causes of failure of earthen dam.	(14)	L3(A)
19	A	Define lining and explain the types lining.	(14)	L4(A)
		(or)		
	B	(i)What are the objectives of canal irrigation management (ii)What are the types of irrigation efficiencies?	(7) (7)	L1 (R)
20	A	What are the remedial measures against soil erosion	(14)	L1(R)
		(or)		
	B	Explain briefly about the recycling of waste water	(14)	L3(A)

BLOOM'STAXONOMY (KNOWLEDGE LEVELS)

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