PERIYAR CENTENARY POLYTECHNIC COLLEGE

PERIYAR NAGAR-VALLAM-THANJAVUR-613 403,

DEPARTMENT OF CIVIL ENGINEERING

SYLLABUS

CED/21/00

SEMESTER SYSTEM

D – SCHEME

CONTENTS

SI.NO	Title	Pg.No
1.	VISION, MISSION, PROGRAM OUTCOMES (PO_S). OUTCOME BASED EDUCATION (OBE)	3-4
2.	RULES AND REGULATIONS	6-14
3.	CURRICULAM OUTLINE	15-17
4.	SCHEME OF EXAMINATIONS	18-20
5.	EQUIVALENT PAPERS (C SCHEME TO D SCHEME)	21-22
6.	DETAILLED SYLLABUS –III SEMESTER	23-76
7.	DETAILLED SYLLABUS –IV SEMESTER	78129
8.	DETAILLED SYLLABUS –V SEMESTER	130-212
9.	DETAILLED SYLLABUS –VI SEMESTER	213-287

PERIYAR CENTENARY POLYTECHNIC COLLEGE
VALLAM – 613 403, THANJAVUR

Diploma In Civil Engineering

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PERIYAR CENTENARY POLYTECHNIC COLLEGE

Periyar Nagar, Vallam – 613 403, Thanjavur

AUTONOMOUS INSTITUTION

VISION

Periyar Centenary Polytechnic College aspires to be recognized as one of the leaders in imparting quality technical education and strives to prepare rural students with excellent technical and life skills for the benefit of the stakeholders and society at large.

MISSION

M1: To impart quality technical education to the students and equip them with knowledge, skills and attitudes that will lead to successful employment in industry/business, entrepreneurship and higher education.

M2: To provide conducive learning environment and adopt well structured teaching – learning practices to make the students technically competent.

M3: To strengthen the collaboration with industry and community for career development, placement and extension services.

M4: To develop the personality of the students and identify themselves as good individuals, professionals and responsible citizens with ethical values.

M5: To inculcate lifelong learning skills to face challenges with innovations.

PROGRAM OUTCOMES (POs)

1. **Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.
2. **Problem analysis:** Identify and analyse well-defined engineering problems using codified standard methods.
3. **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.
4. **Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
5. **Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.
6. **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.
7. **Life-long learning:** Ability to analyze individual needs and engage in updating in the context of technological changes.

PERIYAR CENTENARY POLYTECHNIC COLLEGE

Periyar Nagar, Vallam – 613 403, Thanjavur

AUTONOMOUS INSTITUTION

VISION

Produce competent and socially aware diploma Civil Engineers, by providing quality education and training to meet the challenges for sustainable environment.

MISSION

M1: To provide sound technical knowledge and skills with updated curriculum and infrastructural facilities.

M2: To provide an ambience for effective teaching learning practices

M3: To provide soft skills especially of rural students through co-curricular and extra-curricular activities.

M4: To facilitate the students to play leadership roles for the betterment of the society in a sustainable manner.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Our Diploma graduates will have the ability to practice civil engineering in a responsible, professional and ethical manner or take up higher education and pursue productive careers in private and government organizations/entrepreneurship.

PEO2: Our Diploma graduates will be able to exhibit professionalism, ethical attitude, communication, teamwork, social responsibility and adopt current trends in technology.

PEO3: Our Diploma graduates will be able to engage in lifelong learning and adapt to changing professional and societal needs.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1: Understand the fundamental, mathematical, scientific and engineering concepts to have a significant and positive long term impact on the field of civil engineering and provide sustainable solutions to the civil engineering problems.

PSO2: Apply specific program principles to analysis, design, laboratory investigations and construction aspects of civil engineering infrastructure.

PSO3: Ability to analyse and design using codes of practice and software packages.

OUTCOME BASED EDUCATION(OBE)

Our institution is practicing Outcome Based Education (OBE) which is a student centered instruction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills and attitudes.

In the OBE model, the required knowledge and skill sets for a particular diploma programme is predetermined and the students are evaluated for all the required parameters (Outcomes) during the course of the program.

The OBE model measures the progress of the graduate in four parameters, which are

- Program Educational Objectives (PEO)
- Program Specific Outcomes (PSO)
- Program Outcomes (PO)
- Course Outcomes (CO)

Program Educational Objectives (PEOs) is broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve. PEO's are measured 4-5 years after graduation.

Program Specific Outcomes (PSOs) are the statements that describe what the graduates of specific engineering program should be able to do.

Program Outcomes (POs) are narrower statements that describe what students are expected to know and be able to do by the time of graduation.

Course Out comes (**CO**s) are the measurable parameter which evaluates each students performance for each course that the student undertakes in every semester. The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. According to revised Bloom's taxonomy, the levels in cognitive domain are as follows:

Level	Descriptor	Level of attainment
1	Remembering	Recalling from memory of previously learned material
2	Understanding	Explaining ideas or concepts
3	Applying	Using information in another familiar situation
4	Analyzing	Breaking information into part to explore Understandings and relationships
5	Evaluating	Justifying a decision or course of action
6	Creating	Generating new ideas, products or new ways of Viewing things.

DIPLOMA COURSES IN ENGINEERING / TECHNOLOGY

(SEMESTER SYSTEM)

(Implemented from 2020 -2021)

D SCHEME

RULES AND REGULATIONS

1. Description of the Course:

a. Full Time (3 years)

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

b. Sandwich (3 1/2 years)

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

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

***Each Semester will have 16 weeks duration of studies with 35 hrs / Week for all Diploma Programmes.**

The Curriculum for all the 6 Semesters of Diploma Programme (Engineering & Special Diploma Programmes viz. Modern Office Practice) have been revised and revised curriculum is applicable for the candidates admitted from 2020 - 2021 academic year onwards.

2. Condition for Admission:

Condition for admission to the Diploma Programmes 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 certain minimum requirements, which may be prescribed from time to time.

3. 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	Programmes	H.Sc Academic	H.Sc Vocational		Industrial Training Institutes Courses
		Subjects Studied	Subjects Studied		
			Related Subjects	Vocational Subjects	
1	All the Regular and Sandwich Diploma Programmes	Physics and Chemistry as compulsory along with Mathematics / Biology	Maths / Physics / Chemistry	Related Vocational Subjects Theory & Practical	2 years courses to be passed with appropriate Trade
2	Diploma Programme in Modern Office Practice	English & Accountancy English & Elements of Economics English & Elements of Commerce	English & Accountancy English & Elements of Economics English & Management principles & Techniques English & Typewriting	Accountancy & Auditing Banking Business Management, Co – operative Management, International Trade, Marketing& Salesmanship, Insurance & Material Management, Office Secretaryship	-

- For the Diploma Course related with Engineering/ Technology, the related / equivalent subjects prescribed along with Practicals may also be taken for arriving the eligibility.
- Branch will be allotted according to merit through counseling by the Principal as per communal reservation.
- For admission to the Modern Office Practice Diploma Course the candidates studied the related courses will be given first preference.
- Candidates who have studied Commerce Subjects are not eligible for Engineering Diploma Courses.

4. Age Limit: No Age limit.

5. Medium of Instruction: English

6. Eligibility for the Award of Diploma:

No candidate shall be eligible for the Diploma unless he/she has undergone the prescribed Programme of study for a period of not less than 3 academic years in any institution affiliated to the State Board of

Technical Education and Training, Tamil Nadu, when joined in First Year and two years 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 as given below:

Diploma Programme	Minimum Period	Maximum Period
Full Time	3 Years	6 Years
Full Time (Lateral Entry)	2 Years	5 Years
Sandwich	3 ½ Years	6 ½ Years

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

7. Courses of Study and Curriculum outline:

The courses 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.

8. Examinations:

Autonomous Examinations in all courses of all the semesters under the scheme of examinations will be conducted at the end of each semester.

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

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

9. 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)	Attendance	-	5 Marks
ii)	Test	-	10 Marks
iii)	Assignment	-	5 Marks
iv)	Seminar	-	5 Marks
	Total	**-**	**25 Marks**

i) Course Attendance **05 Marks**

(Award of marks for course attendance to each course 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

ii) Test **10 Marks**

3 tests each of 2 hours duration for a total of 50 marks are to be conducted. Average of these 3 test marks will be taken and the marks to be reduced to: **05 Marks**

The test-IV 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 & II	End of 6th week	50	2 hrs
Test – II	Unit III & IV	End of 12th week	50	2 hrs
Test – III	Unit V	End of 15th week	50	2 hrs
Test– IV	**Model Examination – Compulsory** Covering all the 5 units (Autonomous Examination – question paper pattern)	End of 16th Week	100	3 hrs

From the Academic Year 2020 – 2021 onwards.

Question Paper Pattern for the Test – I, Test – II and Test - III is as follows. The tests should be conducted by proper schedule. Retest marks should not be considered for internal assessment.

For I Year

Question Pattern (Without Choice):

Part A Type Questions: 6 Questions x 1 Mark	:	06 marks
Part B Type Questions: 8 Questions x 2 marks	:	16 marks
Part C Type Questions: 4 Questions x 7 marks	:	28 marks

Total :		**50 marks**

For II & III Year

Question Pattern (Without Choice):

Part A Type questions: 5 Questions × 2 mark	:	10 marks
Part B Type questions: 4 Questions × 3 marks	:	12 marks
Part C Type questions: 2 Questions × 14 marks	:	28 marks

Total	**:**	**50 marks**
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iii) Assignment **5 marks**

For each course, three assignments are to be given each for 20 marks and the average marks scored should be reduced for 5 marks.

Assignment 1: Written notes in relevant topics from the courses in unit I & II.

Assignment 2: Written notes in relevant topics from the courses in unit III , IV &V.

Assignment 3: Objective type online test to understand the principles and thereby gain in-depth knowledge about the course.

iv) <u>Seminar Presentation</u> **5 Marks**

The students have to select the topics either from their courses or general courses which will help to improve their grasping capacity as well as their capacity to express the course 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 5 marks for each theory course. The respective course faculty may suggest topics to the students and will evaluate the submitted materials and seminar presentation. (2$\frac{1}{2}$ marks for the material submitted in writing and 2$\frac{1}{2}$ marks for the seminar presentation). For each course minimum of two seminars are to be given and the average marks scored should be reduced to 5 marks.

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

B. <u>For Practical Courses:</u>

I, II and III Year

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

a) Attendance (Award of marks same as theory courses)	:	**05 Marks**
b) Procedure/ observation and tabulation/Drawings Other Practical related Work	:	**05 Marks**
c) Tests#	:	**10 Marks**
d) Student Centered Learning (SCL) work sheet	:	**05 Marks**

TOTAL		**25 Marks**

 # Tests **10 Marks**

3 tests each of 2 hours duration for a total of 50 marks are to be Conducted. Average of these 3 test marks will be taken and the Marks to be reduced to: **05 Marks**

The Test – IV is to be the Model Examination covering all the Experiments and the marks so obtained will be reduced to: **05 Marks**

- All the Experiments/Exercises indicated in the syllabus should be completed and the same to be given for final Autonomous 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 course 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 Semester, the average marks of all the exercises should be calculated for 20 marks (including Observation, SCL work sheet 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 Autonomous 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 course. The marks awarded for Observation, SCL work sheet, Record work and Attendance should be entered periodically in the Personal Practical Log Book of the staff, who is handling the practical course.

10. 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 Communicative 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.

11. Project Work and Internship:

The students of all the Diploma Programmes 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**.**

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 Mark for Project Work & Internship:

Project Review I	**10 marks**
Project Review II	**10 marks**
Attendance	**05 marks** (Award of marks same as theory course pattern)

Total	**25 marks**

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

b) Allocation of Marks for Project Work & Internship in Autonomous 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 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 Centre / Institutions / Schemes.

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

12. Industrial Training and Project Work (Architectural Assistantship (SW)

i. Industrial Training

In IV and VII semesters, students should undergo the industrial training under the registered architects without fail. During this period, they should have 80% of attendance. Candidates not fulfilling the above are not eligible to appear for the practical examinations and the candidates should redo the industrial training in the next academic year.

The internal Assessment is based on the monthly report, Weekly report and drawing works completed in training period.

Work diary (Internal Assessment)	**25 marks**
Monthly report	5 Marks
Weekly report	5 Marks
Drawing works	10 Marks
Attendance	5 Marks
Total	**25 Marks**

Architect office and studio practice –I &II (IV & VII Sem)

Report writing	60 marks
Viva- voce	40 marks
Total	**100 marks***

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

ii. Project work

a) Internal Assessment Mark for Project Work

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

b) Project work & Viva voce – Autonomous Examination

Project Report	25 marks
Drawing &Presentation	25 marks
Viva Voce	30 marks
Model	20 marks
Total	**100* marks**

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

A neatly prepared PROJECT REPORT as per the format has to be submitted by individual student during the project Work & Viva voce Autonomous Examination.

13. Scheme of Examinations:

The Scheme of examinations for courses is given in Annexure - II.

14. Criteria for Pass:

1. No candidate shall be eligible for the award of Diploma unless he/she has undergone the prescribed programme of study successfully in an institution approved by AICTE and affiliated to the State Board of Technical Education & Training, Tamil Nadu and pass all the courses prescribed in the curriculum.

2. A candidate shall be declared to have passed the examination in a course if he/she secures not less than 40% in theory courses and 50% in practical courses out of the total prescribed maximum marks including both the Internal Assessment and the Autonomous Examinations marks put together, subject 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.

15. 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 semesters in

the first appearance itself and passes all courses within the stipulated period of study 2/3/3 ½ /4 years [Full time(lateral entry)/Full Time/Sandwich/Part Time) without any break in study.

First Class with 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 aggregate marks in all the semesters put together and passes all the semesters except the I and II semester in the first appearance itself and passes all courses within the stipulated period of study 2/3/3 ½ /4 years [Full time (lateral entry)/Full Time/Sandwich/Part Time) 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 semesters put together and passes all the courses within the stipulated period of study 2 / 3/ 3½ / 4 years [Full time(lateral entry)/ Full Time/Sandwich/Part Time) 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 / Part-Time students who pass out Final Examination from October 2023 /April 2024 onwards (both joined First Year in 2020 - 2021)

16. 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)

****

'D'- SCHEME

ANNEXURE - I

CURRICULUM OUTLINE

THIRD SEMESTER

SI.NO	Course Code	Course Name	Hours Per Week			
			Theory/ Hours	Drawing/ Tutorial	Practical/ Hours	Total/ Hours
1.	CED310	Mechanics of Solids	6	-	-	6
2.	CED320	Construction Materials and Construction Practice	5	-	-	5
3.	CED330	Surveying	6	-	-	6
4.	CED340	Building Planning and Drawing	-	4	-	4
5.	CED350	Civil Engineering Drawing and CAD Practical – I	-	-	4	4
6.	CED360	Material Testing Laboratory– I	-	-	3	3
7.	CED370	Surveying Practice –I	-	-	4	4
	Extra &Co-curricular activities	Physical Education	-	-	-	2
		Library	-	-	-	1
		TOTAL	**17**	**4**	**11**	**35**

FOURTH SEMESTER

SI.NO	Course Code	Course Name	Hours Per Week			
			Theory/ Hours	Drawing/ Tutorial	Practical/ Hours	Total/ Hours
1.	CED410	Theory of Structures	6	-	-	6
2.	CED420	Hydraulics	6	-	-	6
3.	CED430	Transportation Engineering	5	-	-	5
4.	CED440	Hydraulics Laboratory	-	-	4	4
5.	CED450	Material Testing Laboratory–II	-	-	3	3
6.	CED460	Construction Practice Laboratory	-	-	4	4
7.	CED470	Surveying Practice –II	-	-	4	4
	Extra &Co-curricular activities	Physical Education	-	-	-	2
		Library	-	-	-	1
		TOTAL	**17**	**-**	**15**	**35**

CURRICULUM OUTLINE

FIFTH SEMESTER

SI.NO	Course Code	Course Name	Hours Per Week			
			Theory/ Hours	Drawing/ Tutorial	Practical / Hours	Total/ Hours
1.	CED510	Structural Engineering	6	-	-	6
2.	CED520	Environmental Engineering	5	-	-	5
3.	CED531 CED532 CED533	**Elective Theory–I** 1. Remote Sensing and Geoinformatics 2. Concrete Technology 3. Geotechnical Engineering	5	-	-	5
4.	CED540	Civil Engineering Drawing and CAD Practical – II	-	3	3	6
5.	CED550	Environmental Engineering Laboratory	-	-	3	3
6.	CED561 CED562 CED563	**Elective Practical –I** 1. Advanced Surveying and Basic GIS Practical 2. Concrete Technology Practical 3. Geotechnical Engineering Laboratory	-	-	3	3
7.	CED570	Entrepreneurship and Startups	-	-	4	4
	Extra &Co-curricular activities	Physical Education	-	-	-	2
		Library	-	-	-	1
		TOTAL	**16**	**3**	**13**	**35**

CURRICULUM OUTLINE

SIXTH SEMESTER

SI.NO	Course Code	Course Name	Hours Per Week			
			Theory/ Hours	Drawing/ Tutorial	Practical / Hours	Total/ Hours
1.	CED610	Construction Management	6	-	-	6
2.	CED620	Estimation, Costing and Valuation	6	-	-	6
3.	CED631 CED632 CED633	**Elective Theory–II** 1. Sustainable and Green Building Technology 2. Urban Planning and Development 3. Water Resources Engineering	5	-	-	5
4.	CED640	Computer Application in Civil Engineering Practice		-	5	5
5.	CED651 CED652 CED653	**Elective Practical –II** 1. Estimation and Costing Laboratory 2. Highway Engineering Laboratory 3. Water Resources Engineering Laboratory	-	-	4	4
6.	CED660	Project work and Internship	-	-	6	6
	Extra& Co-curricular activities	Physical Education	-	-	-	2
		Library	-	-	-	1
		TOTAL	**17**	-	**15**	**35**

D- SCHEME

ANNEXURE - II

SCHEME OF THE EXAMINATION

THIRD SEMESTER

SI.NO	Course Code	Course Name	Examination Marks			Minimum for pass	Duration of Exam Hours
			Internal assessment Marks	Autonomous Examination Marks	Total Marks		
1.	CED310	Mechanics of Solids	25	75	100	40	3
2.	CED320	Construction Materials and Construction Practice	25	75	100	40	3
3.	CED330	Surveying	25	75	100	40	3
4.	CED340	Building Planning and Drawing	25	75	100	40	3
5.	CED350	Civil Engineering Drawing and CAD Practical – I	25	75	100	50	3
6.	CED360	Material Testing Laboratory– I	25	75	100	50	3
7.	CED370	Surveying Practice –I	25	75	100	50	3
TOTAL			**175**	**525**	**700**		

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

FOURTH SEMESTER

SI.NO	Course Code	Course Name	Examination Marks			Minimum for pass	Duration of Exam Hours
			Internal assessment Marks	Autonomous Examination Marks	Total Marks		
1.	CED410	Theory of Structures	25	75	100	40	3
2.	CED420	Hydraulics	25	75	100	40	3
3.	CED430	Transportation Engineering	25	75	100	40	3
4.	CED440	Hydraulics Laboratory	25	75	100	50	3
5.	CED450	Material Testing Laboratory–II	25	75	100	50	3
6.	CED460	Construction Practice Laboratory	25	75	100	50	3
7.	CED470	Surveying Practice –II	25	75	100	50	3
	TOTAL		**175**	**525**	**700**		

FIFTH SEMESTER

SI.NO	Course Code	Course Name	Examination Marks			Minimum for pass	Duration of Exam Hours
			Internal assessment Marks	Autonomous Examination Marks	Total Mark		
1.	CED510	Structural Engineering	25	75	100	40	3
2.	CED520	Environmental Engineering	25	75	100	40	3
3.	CED531 CED532 CED533	**Elective Theory – I** 1. Remote Sensing and Geoinformatics 2. Concrete Technology 3. Geotechnical Engineering	25	75	100	40	3
4.	CED540	Civil Engineering Drawing and CAD Practical – II	25	75	100	50	3
5.	CED550	Environmental Engineering Laboratory	25	75	100	50	3
6.	CED561 CED562 CED563	**Elective Practical–I** 1. Advanced Surveying and Basic GIS Practical 2. Concrete Technology Practical 3. Geotechnical Engineering Laboratory	25	75	100	50	3
7.	CED570	Entrepreneurship and Startups	25	75	100	50	3
TOTAL			**175**	**525**	**700**		

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

SIXTH SEMESTER

SI.NO	Course Code	Course Name	Examination Marks			Minimum for pass	Duration of Exam Hours
			Internal assessment Marks	Autonomous Examination Marks	Total Mark		
1.	CED610	Construction Management	25	75	100	40	3
2.	CED620	Estimation, Costing and Valuation	25	75	100	40	3
3.	CED631 CED632 CED633	**Elective Theory – II** 1. Sustainable and Green Building Technology 2. Urban Planning and Development 3. Water Resources Engineering	25	75	100	40	3
4.	CED640	Computer Applications in Civil Engineering Practice	25	75	100	50	3
5.	CED651 CED652 CED653	**Elective Practical – II** 1. Estimation and Costing Laboratory 2. Highway Engineering Laboratory 3. Water Resources Engineering Laboratory	25	75	100	50	3
6.	CED660	Project Work and Internship	25	75	100	50	3
	TOTAL		**150**	**450**	**600**		

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

List of Equivalent Course C Scheme to D Scheme

THIRD SEMESTER

Sl.No w.e.f oct21	Course Code No	C Scheme	Course Code No	D Scheme
1.	CEC310	Engineering Mechanics	CED310	Mechanics of Solids
2.	CEC320	Construction Materials and Construction Practice	CED320	Construction Materials and Construction Practice
3.	CEC330	Surveying-I	CED330	Surveying
4.	CEC340	Transportation Engineering	CED430	Transportation Engineering
5.	CEC350	Material Testing Lab-I	CED360	Material Testing Laboratory-I
6.	CEC360	Surveying Practice-I	CED370	Surveying Practice-I
7.	CEC370	Computer Application Practical	D002	Computer Application Practical

FOURTH SEMESTER

Sl.No w.e.f apr22	Course Code No	C Scheme	Course Code No	D Scheme
1.	CEC410	Theory of Structures	CED410	Theory of Structures
2.	CEC420	Civil Engineering Drawing-I	CED340	Building Planning and Drawing
3.	CEC430	Surveying-II	CED330	Surveying
4.	CEC440	Estimation and Costing-I	CED620	Estimation Costing and Valuation
5.	CEC450	Material Testing Lab-II	CED450	Material Testing Laboratory-II
6.	CEC460	Surveying Practice-II	CED470	Surveying Practice-II
7.	CEC470	CAD in Civil Engineering Drawing-I	CED 350	Civil Engineering Drawing and CAD Practical -I

List of Equivalent Course C Scheme to D Scheme

FIFTH SEMESTER

Sl.No w.e.f oct22	Course Code No	C Scheme	Course Code No	D Scheme
1.	CEC510	Structural Engineering	CED510	Structural Engineering
2.	CEC520	Environmental Engineering and Pollution Control	CED520	Environmental Engineering
3.	CEC530	**Elective Theory I**	CED530	**Elective Theory I**
	CEC531	Advanced Construction Technology	CED532	Concrete Technology
	CEC532	Remote Sensing and GIS	CED531	Remote Sensing and Geo informatics
	CEC533	Soil mechanics and Foundation Engineering	CED533	Geotechnical Engineering
	CEC534	Water Resources Management	CED633	Water Resource Engineering
4.	CEC540	Civil Engineering Drawing-II	CED540	Civil Engineering Drawing and CAD Practical-II
5.	CEC550	Construction Practice Lab	CED460	Construction Practice Laboratory
6.	CEC560	CAD in Civil Engineering Drawing-II	CED540	Civil Engineering Drawing and CAD Practical-II
7.	CEC570	Life and Employability Skills Practical	D001	Communication Skill Practical

SIXTH SEMESTER

Sl.No w.e.f apr23	Course Code No	C Scheme	Course Code No	D Scheme
1.	CEC610	Construction Management with MIS	CED610	Construction Management
2.	CEC620	Hydraulics	CED420	Hydraulics
3.		**Elective Theory II**		**Elective Theory II**
	CEC631	Steel Structures	-	-No Equivalent
	CEC632	Town Planning	CED632	Urban Planning And Development
	CEC633	Earthquake Engineering	-	No Equivalent
	CEC634	Building services	-	No Equivalent
4.	CEC640	Estimation and Costing-II	CED620	Estimation Costing and Valuation
5.	CEC650	Hydraulics Lab	CED440	Hydraulics Laboratory
6.	CEC660	Computer Applications in Civil Engineering Practice	CED640	Computer Applications in Civil Engineering Practice
7.	CEC670	Project work	-	No Equivalent

DETAILLED SYLLABUS –III SEMESTER

CED310 MECHANICS OF SOLIDS

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
MECHANICS OF SOLIDS	**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	NO.OF HOURS
I	Simple Stresses and Strains	18
II	Shear Force and Bending Moment	17
III	Geometrical Properties of Sections	18
IV	Stresses in Beams and Shafts	17
V	Pin Jointed Frames	17
	Tests & Model Exam	9
TOTAL		**96**

COURSE DESCRIPTION:

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:

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

- Analyse the mechanical properties of engineering materials, elastic constants, relationship between elastic constants, different types of stresses and strains, the deformation of elastic bodies under simple stresses, the use and principles of composite sections;

- Analyse the structural behavior of materials under various loading conditions.
- Interpret shear force and bending moment diagrams for various types of beams and loading Conditions, application of stress and strain in engineering field. Articulate practical applications of moment of inertia of symmetrical and unsymmetrical structural sections.
- Determine the different types of stresses induced in beams and shafts due to bending and twisting moments respectively
- Analyse perfect frames for vertical loads by analytical as well as graphical methods.

COURSE OUTCOMES:

course	**CED310 MECHANICS OF SOLIDS**
After successful completion of this course, the students will be able to	
D310.1	Describe about stresses, strains and deformation of solids.
D310.2	Understand the SF and BM of the beams for all types of loading and to draw SFD & BMD.
D310.3	Understand the geometrical properties of section and compute moment of inertia of various sections.
D310.4	Apply Bending theory.
D310.5	Analyse the joints section by analytical and graphical methods.

CED310 MECHANICS OF SOLIDS

UNIT I **[18Hrs]**

SIMPLE STRESSES AND STRAINS

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 [2 Hrs]

Types of forces on structural members-Study of strength of material-Mechanical properties of materials–Rigidity, Elasticity, Plasticity, Compressibility, Hardness, [2 Hrs]

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 [2 Hrs]

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 [2 Hrs]

Hooke's law-Elastic Constants-Definitions of: Young's Modulus of Elasticity –Shear modulus (or) Modulus of Rigidity-Bulk Modulus-Relationship between elastic constants [2 Hrs]

(Derivations not necessary) - Simple problems.

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 [2 Hrs]

Limit of proportionality, Elastic limit, Yield stress, Ultimate stress, Breaking stress, Actual / Nominal stresses - Working stress - Factor of safety [2 Hrs]

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 [2 Hrs]

Deformation of prismatic bars due to its self weight- Numerical problems. Composite Sections – Examples of composite sections in Engineering field-Advantages [1 Hr]

Assumptions made–Principles of analysis of Composite sections-Modular ratio-Equivalent area **(No problems)** [1 Hr]

UNIT II **[17Hrs]**

SHEAR FORCE AND BENDING MOMENT

2.1 TYPES OF LOADS AND BEAMS

Definitions of: Axial load, Transverse load, Concentrated (or) Point load, Uniformly Distributed load (UDL), Varying load [2 Hrs]

Types of Supports and Reactions: Simple support, Roller support, [2 Hrs]

Hinged support, Fixed support; Vertical reaction, Horizontal reaction, Moment reaction [2 Hrs]

Types of Beams based on support conditions- Diagrammatic representation of beams, loads and supports [2 Hrs]

Static equilibrium equations –Determinate and indeterminate beams. [2 Hrs]

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 [2 Hrs]

S.F and B.M of general cases of determinate beams–S.F and B.M diagrams for Cantilevers, Simply supported beams [2 Hrs]

Position of maximum BM – Derivation of Relation between intensity of load, S.F and B.M. [1 Hr]

Numerical problems on S.F and B.M. (Determinate beams with concentrated loads udl and couple) [2 Hrs]

UNIT III

GEOMETRICAL PROPERTIES OF SECTIONS **[18Hrs]**

3.1 CENTROID

Geometrical properties–Definitions and examples of Symmetrical, Anti Symmetrical, Asymmetrical shapes- [2 Hrs]

Definitions of centre of gravity and centroid- Centroid of Symmetrical shapes (solid / hollow square, rectangular, circular, I Sections) - [2 Hrs]

Centroid of Asymmetrical shapes (triangular, semi circular, quadrant, trapezoidal, parabolic sections) – [2 Hrs]

Centroid of Anti Symmetric shapes (S, Z sections)– Built up structural sections– Problems. [2 Hrs]

3.2 MOMENT OF INERTIA

Definitions of: Inertia, Moment of Inertia, Polar moment of inertia, Radius of gyration, Section Modulus, [2 Hrs]

Polar modulus-Parallel and perpendicular axes theorems-Derivation of expressions for M.I /Polar M I, [2 Hrs]

Section modulus and Radius of gyration of regular geometrical plane sections (rectangle and circle only) – [2 Hrs]

M.I about centroidal axis / base, Section modulus, [2 Hrs]

Radius of gyration of symmetric, asymmetric, anti symmetric and built up symmetrical sections – Numerical problems. [2 Hrs]

UNIT IV

STRESSES IN BEAMS AND SHAFTS **[17Hrs]**

4.1 STRESSES IN BEAMS DUE TO BENDING

Types of Bending stresses – Neutral axis – Theory of simple bending – Assumptions – Moment of resistance – [2 Hrs]

Derivation of flexure/bending equation $M / I = E / R = \sigma/y$ – [2 Hrs]

Bending stress distribution – Curvature of beam – [1 Hr]

Position of N.A and centroidal axis – Stiffness equation – Flexural rigidity – Strength equation – Significance of Section modulus – Numerical problems. [2 Hrs]

4.2 STRESS IN SHAFTS DUE TO TORSION

Definitions of: Shaft, Couple, Torque (or) Twisting moment – [2 Hrs]

Types of Shafts (one end fixed and the other rotating, both ends rotating at different speeds) – [2 Hrs]

Theory of Pure Torsion – Assumptions -Derivation of Torsion equation, T / Ip = σ_{max}/ R = GΘ / l - [2 Hrs]

Shear stress distribution in circular section due to torsion - Strength and Stiffness of shafts – Torsional rigidity – [2 Hrs]

Torsional modulus - Power transmitted by a shaft - Numerical problems. [2 Hrs]

UNIT V

PIN JOINTED FRAMES **[17Hrs]**

5.1 ANALYSIS BY ANALYTICAL METHOD (METHOD OF JOINTS)

Definitions of: Frame / Truss, Pin Joint, Nodes, Rafters, Ties, Struts, Slings - Determinate and indeterminate frames - [2 Hrs]

Classification of frames - Perfect and imperfect frames –Deficient / Instable and redundant frames – [2 Hrs]

Formulation of a perfect frame - Common types of trusses - Support conditions - Resolution of a force - Designation of a force - Nature of forces in the frame members – [2 Hrs]

Analysis of Symmetrical Frames – Assumptions - Methods of analysis - Analytical methods - Method of Joints and Method of Sections – [2 Hrs]

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. [2 Hrs]

Identification of members with nil force in a determinate truss [1 Hr]

5.2 ANALYSIS BY GRAPHICAL METHOD

Graphic statics - Advantages - Space diagram - Bow's notation- [2 Hrs]

Resultant force (or) Equivalent force -Equilibrant force - Vector diagram – [2 Hrs]

Determination of magnitude and nature of forces in the members of a cantilever / simply supported determinate trusses (with not more than eight members) with vertical nodal loads only. [2 Hrs]

Tests& Model Exam **[9 Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Strength of Materials	R.S.Khurmi	S.Chand & Company Ltd, New Delhi
2.	Strength of Materials	S.Ramamirtham	Dhanpat Rai (2003)
3.	Analysis of Structures-Vol 1	Vazirani & Ratwani	Khanna Publishers(2003)

REFERENCE BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Mechanics of Structures- Vol 1	S.B.Junnarkar	Charotar Publishing House
2.	Elements of Engineering Mechanics	Sanchayan Mukherjee	PHI Learning Pvt. Ltd
3.	Engineering Mechanics	R K Bansal	Laxmi Publications Pvt.Ltd

LEARNING WEBSITES

1. https://youtu.be/PtEOFJGM2_I
2. 1 Introduction (nptel.ac.in)
3. NPTEL :: Civil Engineering - Mechanics of solids

CONTINUES INTERNAL ASSESSMENT

Attendance	-5 marks
Tests	-10 marks
Assignment	-5 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D310.1	3	3	3	2	3	2	3	3	3	2
D310.2	3	3	3	2	3	2	3	3	3	2
D310.3	3	3	3	2	3	2	3	3	3	2
D310.4	3	3	3	2	3	2	3	3	3	2
D310.5	3	3	3	2	3	2	3	3	3	2
D310Total	15	15	15	10	15	10	15	15	15	10
Correlation level	3	3	3	2	3	2	3	3	3	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED320 CONSTRUCTION MATERIALS AND CONSTRUCTION PRACTICE

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester**:** 16 weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
CONSTRUCTION MATERIALS AND CONSTRUCTION PRACTICE	**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	NO.OF HOURS
I	Building Materials	14
II	Building Materials (Contd.)	14
III	Foundations And Masonries	15
IV	Doors, Floors, Roofs, etc.,	14
V	Pointing, Plastering, Painting, Form Work, etc.,	14
	Tests & Model Exam	9
	TOTAL	**80**

COURSE DESCRPITION:

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.

Toper form the above tasks, it is essential that students should have knowledge of various subcomponents of buildings like foundations, walls, roofs, staircases, 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 ceramic products, glass, metals and plastics.
- Explain the method of preparation of mortar, cement concrete and state the different types of structures.
- Describe the different types of foundations.
- Describe the classification of stone masonry & brick masonry. State the different types 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 OUTCOMES

Course	**CED320 CONSTRUCTION MATERIALS AND CONSTRUCTION PRACTICE**
After successful completion of this course the students will be able to	
D320.1	Understand the various types and properties of building materials and its engineering application.
D320.2	Understand the materials and types used for buildings.
D320.3	Understand the details of sub structures and super structures.
D320.4	Know the different types of doors, windows, ventilators, stairs floors, roofs.
D320.5	Understand the construction practices and techniques such as plastering , scaffolding, anti termite treatment, etc

CED320 CONSTRUCTION MATERIALS AND CONSTRUCTION PRACTICE

UNIT I **[14 Hrs]**

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 Hrs]

1.2 ROCKS ANDSTONES

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 Hrs]

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 Hrs]

1.4 LIME ANDPOZZOLANAS

Sources of lime - classification lime - Fat, Hydraulic and Poor lime - uses of lime - Pozzolanic materials - Surki, Fly ash, Ground blast furnace slag, Rice husk ash - Advantages of adding pozzolanas to cement. [2 Hrs]

1.5 CEMENT

Definition - Composition of ordinary Portland cement - Functions of cement ingredients - Different types of cements - Grades of cement (33,43and53) – Storage of cement - Tests on cement (Names only) - objects of each test - Test requirements/ BIS specifications of OPC–Admixtures - Definition, types and uses. [2 Hrs]

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 groundwater - Minimum pH value. [2 Hrs]

1.7 GLASS

Definition - Constituents of glass - Classification of glass - Functions and Utility - Types of glass, sizes and thickness used in buildings. [2 Hrs]

UNITII **[14 Hrs]**

2.1 MORTAR

Definition - Properties and uses of mortar M sand for mortar - Types of mortar - Cement and Lime mortar - Mix ratio of cement mortars for different works. [1 Hr]

2.2 CONCRETE

Definition - Constituents of concrete and their requirements - uses of concrete - Types of concrete: Lime concrete, cement concrete and light weight concrete – self [1 Hr]

compacting concrete and Ready Mixed concrete -Definitions only.

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 Hrs]

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 - [2 Hrs]

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. [2 Hrs]

2.5 TIMBER AND TIMBER PRODUCTS

Types of Timber -Teak, Sal, Rosewood, Mango, Jack -Defects in timber seasoning of timber- objectives - Timber Products- Veneers, Ply woods, Particle Board, Fibre board, Hard board, Block board, and Laminated board Uses. [2 Hrs]

2.6 ROOF COVERINGS

Definition - objectives and uses - AC Sheets- FRB Sheets - G.I. sheets- Steel sheets- Polycarbonate sheets- Shell roof - RCC roof Advantages - Types**.** [2 Hrs]

2.7 DAMP PROOFING MATERIALS

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 Hrs]

UNIT III **[15 Hrs]**

3.1 INTRODUCTION TO STRUCTURES

Permanent and temporary structures - Life of structures - Sub structure - super structure - load bearing structure - framed structure - concept of framed structure - advantages of framed structure. [2 Hrs]

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 – [2 Hrs]

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. [2 Hrs]

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 stone masonry - 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 Hrs]

3.4 BRICK MASONRY

Definition - Common terms used - Header, stretcher, bed joint, lap, perpend, closer, king, queen & bevelled, 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 [2 Hrs]

Cavity bond masonry - Defects in brick masonry - Maintenance of brick masonry - Reinforced brick masonry - purpose - Its Advantage with respect to strength and Earthquake resistance. [1Hr]

3.5 PARTITION

Definition - Requirements of good partition wall - Types Brick, Concrete, glass, Aluminium frame with Glass sheet, timber, straw board, wood wool, Asbestos Cement board and plastic board partitions. [2Hrs]

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. [2 Hrs]

UNIT IV **[14 Hrs]**

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, 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. [2 Hrs]

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 [2 Hrs]

Materials used, admixtures added - mixing, moulding, placing and compacting, curing, drying. [1 Hr]

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. [2Hrs]

4.4 FLOORS AND FLOORING

Floors - Definition - Types - Timber, Composite, RCC floors Flooring - Definition- Materials used - Selection of flooring types - Construction Methods (As per C.P.W.D/P.W.D Specifications) - [2 Hrs]

Mosaic, Granolithic, Tiled, Granite, Marble, Pre cast concrete flooring, Plastic & PVC tile flooring- Carpet tile & Rubber flooring. [1 Hr]

4.5 ROOFS

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. [2 Hrs]

4.6 WEATHERING COURSE

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. [2 Hrs]

UNIT V **[14 Hrs]**

5.1 POINTING

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. [2 Hrs]

5.2 PLASTERING

Definitions - Objectives - Cement mortars for Plastering - Requirements of a good plaster - Methods of Plastering - Defects in plastering - Stucco plastering [2 Hrs]

Acoustic plastering - Granites silicon – plastering – Sand faced Pebble dash - Wall paper finishing - Wall tiling. [1 Hr]

5.3 WHITE WASHING, COLOUR WASHING , DISTEMPERING, PAINTING & VARNISHING

White washing – preparation of surface – Application of white wash - Colour washing-Distempering – Preparation of surfaces –Application of distemper- [2 Hrs]

Painting & Varnishing – Preparation of Surface - Application of Painting &Varnishing. [1 Hr]

5.4 ANTI-TERMITE TREATMENT

Definition – objectives and uses - Methods of termite treatment. [2 Hrs]

5.5 SCAFFOLDING, SHORING AND UNDER PINNING

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. [2 Hrs]

5.6 FORM WORK

Definition - Materials used - Requirements of a good form work - Form work for column, RC beams and RC slab. [2 Hrs]

Tests& Model Exam **[9 Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Building Materials	P.C.Varghese	Prentice-Hall of India (P) Ltd, I Edition, 2011.
2.	Building Materials	S.K.Duggal	New Age International (P) Ltd., II Edition, 2003.

REFERENCE BOOKS :

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Building Construction	P.C.Varghese	Prentice-Hall of India (P) Ltd, I Edition, 2011.
2.	Building Constructions	Dr. B.C. Punmia	Laxmi publications (P)Ltd New Delhi.2004
3.	Building Construction	Ashokkumar Jain	Laxmi publications (P)Ltd Chennai. 2002

LEARNING WEBSITES

1. https://youtube.videoken.com/embed/EIDXE28_8eQ
2. NPTEL :: Civil Engineering - NOC:Basic construction materials
3. NPTEL :: Civil Engineering - NOC:Characterization of Construction Materials

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Tests	-10 marks
Assignment	-5 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D320.1	3	3	3	3	3	3	3	3	3	2
D320.2	3	3	3	3	3	3	3	3	3	2
D320.3	3	3	3	3	3	3	3	3	3	2
D320.4	3	3	3	3	3	3	3	3	3	2
D320.5	3	3	3	3	3	3	3	3	3	2
D320 Total	15	15	15	15	15	15	15	15	15	10
Correlation level	3	3	3	3	3	3	3	3	3	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED330 SURVEYING

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
SURVEYING	**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	NO.OF HOURS
I	Introduction to Surveying and Chain Surveying and compass surveying	20
II	Levelling	17
III	Theodolite Surveying	17
IV	Tacheometric Surveying & Contour Surveying	17
V	Total Station and Global Positioning system	16
	Tests & Model Exam	9
TOTAL		**96**

COURSE DESCRIPTION:

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 the curriculum 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, Tacheometric 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 OUTCOMES:

course	**CED330 SURVEYING**
After successful completion of this course the students will be able to	
D330.1	Understand the working principles of survey instruments. Prepare drawing as per recorded and corrected measurements.
D330.2	Prepare drawing as per recorded and corrected measurements of bearings with chain and compass survey.
D330.3	Explain the procedure for levelling and find the reduced level
D330.4	Understand the types of levelling.
D330.5	Understand the contour surveying and applications of GPS.

CED 330 SURVEYING

UNIT I

INTRODUCTION TO SURVEYING AND CHAIN SURVEYING AND COMPASS SURVEYING **[20Hrs]**

1.1 SURVEYING

Definition - Objectives and uses of surveying -Classification of Surveying - Principles of surveying. [2 Hrs]

1.2 CHAIN SURVEYING

Introduction - Instruments used for chaining- Chains and Tapes, Types - Definitions of terms commonly used in chain surveying: [2 Hrs]

Survey stations, base line, check line and tie line - Ranging: Direct and Indirect ranging [2 Hrs]

Offsets: -Definition, types, instruments used –Errors in Chaining, [2 Hrs]

Tape corrections and its necessity. [2 Hrs]

1.3 COMPASS SURVEYING

Angular measurements-Necessity Instruments used Prismatic compass - [2 Hrs]

Construction details, functions and Temporary adjustment - [2 Hrs]

Types of meridians - Types of bearings -Whole circle and Reduced bearings, Fore and Back bearings- [2 Hrs]

Computation of included angles from bearings- [2 Hrs]

Computation of bearings from included angles - Problems. [2 Hrs]

UNIT II

LEVELLING **[17Hrs]**

2.1 LEVELLING

Levelling - Definition - Level Parts, Functions, Accessories- Types of levels **:** Dumpy level, Quick setting level, Automatic and Laser level Levelling staff **–** [2 Hrs]

Types Component parts of Levelling instrument – [2 Hrs]

Definitions of terms used **:** Level surface, Horizontal and Vertical surfaces, Datum, Bench marks, Reduced level, Rise, Fall, [2 Hrs]

Line of collimation, Axis of telescope, Axis of bubble tube, Station, Back sight, Fore sight, Intermediate sight, [2 Hrs]

Change point, Height of instrument, Focusing and Parallax – [2 Hrs]

Temporary adjustment of a level - Balancing - Back sight and Foresight- [2 Hrs]

Principle of levelling - Simple levelling –Levelling field book – [2 Hrs]

Reduction of levels – Height of collimation and Rise and Fall method - [2 Hrs]

Comparison of methods –

Problems on reduction of levels – Missing entry calculations: Problems. [1 Hr]

UNIT III **[17Hrs]**

THEODOLITE SURVEYING

3.1 THEODOLITE SURVEYING

Introduction - Types of Theodolites: Transit and non- transit [2 Hrs]

Theodolite, Vernier and Micrometer Theodolites, [2 Hrs]

Electronic Theodolite(Principles and description only) - [2 Hrs]

Component parts of a transit Theodolite - Functions - [2 Hrs]

Technical terms used in Theodolite surveying - Temporary adjustments- [2 Hrs]

Measurement of horizontal angle by method of repetition and reiteration- [2 Hrs]

Measurement of vertical angle and deflection angle- reading bearing of a line – [2 Hrs]

Theodolite traversing- methods- field checks in closed traverse – latitude and departure

consecutive coordinates – independent coordinates-problems on computation of area [2 Hrs]

of closed traverse – omitted measurements -problems [1 Hr]

UNIT IV **[17Hrs]**

TACHEOMETRIC SURVEYING AND CONTOUR SURVEYING

4.1 TACHEOMETRIC SURVEYING

Introduction-Instruments used in tacheometry - [2 Hrs]

Systems of tacheometry: Stadia and Tangential tacheometry [2 Hrs]

Principles - Fixed hair method of tacheometry – [2 Hrs]

Distance and Elevation formulae-Anallatic lens (No proof) - [2 Hrs]

Advantages and uses – direct reading tacheometers-determination of constants of a [1 Hrs]

tacheometer -problems.

4.2 CONTOUR SURVEYING

Definition - Contour - Contouring - Characteristics of contours - [2 Hrs]

Methods of contouring - Direct and Indirect methods - [2 Hrs]

Tacheometric contouring - Interpolation of contours - [2 Hrs]

Different methods - Contour gradient - Uses of contour plan and map [2 Hrs]

UNIT V **[16Hrs]**

TOTAL STATION AND GLOBAL POSITIONING SYSTEM

5.1 TOTAL STATION

Introduction - Application of total station - Component parts of a Total Station - [2 Hrs]

Accessories used - Summary of total station- characteristics - [2 Hrs]

Features of total station - Electronic display and data reading – field procedure for co- [2 Hrs]

ordinate measurement

-Instrument preparation, Setting and Measurement (Distance, Angle, Bearing etc.). [2 Hrs]

5.2 GLOBAL POSITIONING SYSTEM (GPS)

Introduction- Maps - Types of Maps - Various Satellites used by GPS - [2 Hrs]

Differential GPS -Fundamentals of GPS - Application of GPS – GPS Receivers - [2 Hrs]

Hand held GPS Receiver - Function Field procedure - [2 Hrs]

Observation and processing applications in Civil Engineering. [2 Hrs]

Tests & Model Exam **[9 Hrs]**

TEXT BOOK:

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Surveying and Levelling Part 1 & 2	Kanetkar.T.P. & S.V.Kulkarni	Punavidyarthigriha, Prakashan, 23rd edition, 2008.
2.	Surveying Volume I	Punmia.B.C. Ashok K.Jain&Arun K. Jain	LaxmiPublications Private Limited,. 16th edition, 2011

REFERENCE BOOK:

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Surveying	Mimi Das Saikia, Bhargab Mohan Das &Madan Mohan Das	PHI Learning ,Private Limited, Edition 2010
2.	Fundamentals of Surveying	S. K. Roy	PHI Learning Private Limited, Edition 2010

LEARNING WEBSITES

1. https://youtu.be/djEYYXAW1Jc
2. https://youtu.be/75s0Gsj_0Os
3. https://youtube.videoken.com/embed/I1KCZCyNWbA
4. NPTEL :: Civil Engineering - Surveying

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Tests	-10 marks
Assignment	-5 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D330.1	3	3	3	3	2	3	3	3	3	3
D330.2	3	3	3	3	2	3	3	3	3	3
D330.3	3	3	3	3	2	3	3	3	3	3
D330.4	3	3	3	3	2	3	3	3	3	3
D330.5	3	3	3	3	2	3	3	3	3	3
D330 Total	15	15	15	15	10	15	15	15	15	15
Correlation level	3	3	3	3	2	3	3	3	3	3

Correlation level 1 – Slight (low)

Correlation level 2 – Moderate (Medium)

Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

****

CED340 BUILDING PLANNING AND DRAWING

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Course	Instructions		Examination			
	Hours / Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
BUILDING PLANNING AND DRAWING	**4 Hrs.**	**64 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	NO.OF HOURS
I	Introduction	5
II	Planning of Building	5
III	Basic Drawings	9
IV	Building Drawings	36
	Tests & Model Exam	9
	TOTAL	**64**

COURSE DESCRIPTION:

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 thorough knowledge of planning various types of buildings**.**

COURSE OUTCOMES:

Course	**CED340 BUILDING PLANNING AND DRAWING**
After successful completion of this course, the students will be able to	
D340.1	Understand Building bye laws and approval plans.
D340.2	Know the planning for residential , industrial and other public buildings
D340.3	Prepare detailed drawing for doors, windows, roof trusses and rain water harvesting.
D340.4	Prepare detail drawings for single and two storied residential building and public building.

CED340 BUILDING PLANNING AND DRAWING

UNITI **[5 Hrs]**

INTRODUCTION

1.1 CONVENTIONS, SYMBOLS

General – Conventions- Title block- Scales- Line work- Lettering- Symbols- Abbreviations [1 Hr]

1.2 BUILDING BYE-LAWS AND SUBMISSION OF DRAWINGS

Objects of bye-laws- Importance of bye-laws- Function of local authority- Set backs- 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- [2 Hrs]

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. [2 Hrs]

UNIT II **[5 Hrs]**

PLANNING OF BUILDINGS

2.1 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. [2 Hrs]

2.2 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). [2 Hrs]

2.3 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). [1 Hr]

UNIT III **[9 Hrs]**

BASIC DRAWINGS

Standard symbols used in Civil Engineering Drawing.

Draw the elevation of : [1 Hr]

1. Fully panelled double leaf door.

2. Fully Panelled single leaf door [1 Hr]
3. Flush door [1 Hr]
4. Fully Panelled window with grill [1 Hr]
5. Partly glazed and partly panelled window [1 Hr]
6. Lean- to –roof [1 Hr]
7. King post roof truss [1 Hr]
8. Steel roof truss [1 Hr]
9. Rain water Harvesting– Recharging into the ground
   a. Shallow well system
   b. Percolation pit system. [1 Hr]

UNIT IV **[36 Hrs]**

BUILDING DRAWINGS

Preparation of plan, section and elevation of buildings with specifications for the given line drawing to suitable Scale:

1. A Reading room with R.C.C flat roof [2 Hrs]
2. A House with single bed room and attached bathroom with R.C.C. flat roof. [4 Hrs]
3. A residential building with two bed rooms with R.C.C. flat roof [4 Hrs]
4. A Two roomed house with RCC slope roof with gable ends [2 Hrs]
5. A Small workshop with north light steel roof truss (6 to 10m Span) over R.C.C. Columns. [4 Hrs]
6. A Primary health center for rural area with R.C.C roof. [4 Hrs]
7. A Village Library building with R.C.C flat roof [4 Hrs]
8. A small Restaurant building with R.C.C flat roof [4 Hrs]
9. A Single storied School building with R.C.C flat roof [4 Hrs]
10. A Bank building with R.C.C flat roof. [4 Hrs]

Tests & Model Exam **[9 Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1..	Civil Engineering Drawing and house planning	B.P. Verma	KhannaPublisher1986
2.	Building Planning and Drawing	Dr. N. Kumaraswamy and A.KameswaraRao	CharotarPublishing House 6th Edition

REFERENCE BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Civil Engineering Drawing	S.C. Rangwala	SBS Publishers& Distributor III Edition
2.	Building Planning and Construction Companion	Vaidhyanathan, I. Kulasekaran	Chelsea Green Publishing, 2012

LEARNING WEBSITES

1. https://youtu.be/snhnB6BQZS0
2. https://nptel.ac.in/courses/105/102/105102088/-
3. https://youtu.be/VkqJY9syobc

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Tests	-10 marks
Assignment	-5 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D340.1	3	3	2	-	2	-	3	2	3	3
D340.2	3	3	2	-	2	-	3	2	3	3
D340.3	3	3	2	-	2	-	3	2	3	3
D340.4	3	3	2	-	2	-	3	2	3	3
D340 Total	12	12	8	-	8	-	12	8	12	12
Correlation level	3	3	2	-	2	-	3	2	3	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED350 CIVIL ENGINEERING DRAWING AND CAD PRACTICAL-I

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
CIVIL ENGINEERING DRAWINGAND CAD PRACTICAL - I	**4 Hrs**	**64 Hrs**	**25**	**100***	**100**	**3 Hrs.**

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

DETAILED ALLOCATION OF MARKS

SI.NO	NAME OF THE ACTIVITY	MARKS
I	PART –A	40 marks
II	PART – B	45 marks
III	Viva – voce	5 marks
IV	Mini-Project	10 marks
	TOTAL	**100 marks**

Mini Project Evaluation (10 Marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

EQUIPMENTS REQUIRED

SI.NO.	LIST OF THE EQUIPMENTS	QUANTITY REQUIRED
1.	Computers	30 Nos.
2.	Laser printer	3 Nos.
3.	CAD software	30 Users

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 OUTCOMES:

Course	**CED350 CIVIL ENGINEERING DRAWING AND CAD PRACTICAL -I**
After successful completion of this course, the students will be able to	
D350.1	Know the basic CAD commands and draw the building components.
D350.2	Describe the civil engineering drawings effectively and efficiently using 2D & 3D projection by CAD software.
D350.3	Detailing building plans in CAD environment
D350.4	Draw the plan, section and elevation of Buildings.
D350.5	Prepare the approval drawings for buildings such as residential buildings, public buildings, commercial buildings, and develop the mini projects with report.

CED350 CIVIL ENGINEERING DRAWING AND CAD PRACTICAL-I

Introduction of CAD software for Preparation of Drawings

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.

3. Section of semicircular Arch
4. Elevation of door, partly panelled and partly glazed
5. Preparation of Plan showing arrangement of furniture / fixtures and other features with standard sizes for the followings (Each room to 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
6. Steel Structures: Cross section of I, Channel, T, Angle and Tubular section, Compound Beams.
7. 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

8. Plan, Section and Elevation of a single bed roomed building (R.C.C. Roof)
9. Plan, Section and Elevation of a Double bed roomed building (R.C.C. Roof)
10. Plan, Section and Elevation of a Primary School Building
11. Plan, Section and Elevation of a Hospital Building
12. Plan, Section and Elevation of a Workshop with steel columns, Steel roof truss and Metal sheet Roofing of about 300 m^2 area.
13. Preparation of approval drawing to be submitted to Corporation or Municipality showing required details in one sheet such as
    a) Site Plan (Land boundary, Building boundary, Car Parking, Passage, sanitary layout, 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.
14. Plan, Section and Elevation of a Primary Health Center
15. Mini Project

The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES:

1. NPTEL :: Civil Engineering – NOC :Engineering Graphics
2. https://www.thesourcecad.com/autocad-tutorials
3. https://youtu.be/cmR9cfWJRUU
4. https://youtu.be/d4g2H0IHHPU

DETAILS OF INSTRUMENTS

Computer, table & chair - Each 1 per student

SOFTWARE REQUIRED

Cad Software

CONTIUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure /observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D350.1	2	3	3	3	2	2	3	2	3	3
D350.2	2	3	3	3	2	2	3	2	3	3
D350.3	2	3	3	3	2	2	3	2	3	3
D350.4	2	3	3	3	2	2	3	2	3	3
D350.5	2	3	3	3	2	2	3	2	3	3
D350 Total	10	15	15	15	10	10	15	10	15	15
Correlation level	2	3	3	3	2	2	3	2	3	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED350 CIVILENGINEERING DRAWING AND CAD PRACTICAL-I

Model Question Paper

SI NO	Answer the Following Questions Answer All the questions from (part A; questions carries 40 marks) part B; questions carries 45 marks)	CO	PO
1. A	Draw the section of semi a circular arch by using AutoCAD commands for the following dimensions. Span of the arch: 1000 mm Rise: 500 mm Height of wall: 1500 mm Wall thickness: 300 mm	D350.2	PO1,PO2, PO3,PO4, PO7
B.	Draw the plan, section and elevation of a given single storey "Single bed Roomed building" with R.C.C roof to a suitable scale by using AutoCAD Commands (Line plan and detailed specifications are to be given by the Examiners).	D350.3	PO1,PO2, PO3,PO4, PO7
2. A	A. Draw the elevation of a door partly panelled and partly glazed by using AutoCAD commands for the following dimensions. Door size: 2000 mm x 1200 mm Frame width: 75 mm Panel thickness: 25 mm thick Glass panel: 3 mm thick Assume any other details suitably.	D350.2	PO1,PO2, PO3,PO4, PO7
B.	Draw the plan, section and elevation of a single storey "Double bed roomed building with R.C.C roof to a suitable scale by using AutoCAD commands (Line plan and detailed specifications are to be given by the Examiners).	D350.4	PO1,PO2, PO3,PO4, PO7
3. A	Prepare a plan showing the arrangement of furniture's/fixtures and other Features with standard sizes for a "Living room".	D350.4	PO1,PO2, PO3,PO4, PO7
B.	Draw the plan and section of a single storey "Primary school building" with R.C.C roof to a suitable scale by using AutoCAD commands (Line plan and detailed specifications are to be given by the Examiners).	D 350.2	PO1,PO2, PO3,PO4, PO7
4. A	Prepare a plan showing the arrangement of furniture's/fixtures and other features With standard sizes for a "Bed room".	D 350.4	PO1,PO2, PO3,PO4, PO7
B.	Draw the plan and section of a typical "Hospital building" with R.C.C roof to a suitable scale by using AutoCAD commands (Line plan and detailed specifications Are to be given by the Examiners).	D 350.4	PO1,PO2, PO3,PO4, PO7
5. A	Prepare a plan showing the arrangement of furniture's/fixtures and other features with standard sizes for a "Kitchen".	D 350.4	PO1,PO2, PO3,PO4,

			PO7
B.	Draw the plan and section of a small "Workshop building" with steel columns, steel roof truss and metal sheet roofing to a suitable scale by using AutoCAD commands(Line plan and detailed specifications are to be given by the Examiners).	D350.4	PO1,PO2, PO3,PO4, PO7
6. A	Prepare a plan showing the arrangement of furniture's/fixtures and other features With standard sizes for a "Toilet".	D350.4	PO1,PO2, PO3,PO4, PO7
B.	Draw the plan, section and elevation of a given single storey "Single bed roomed building" with R.C.C roof to a suitable scale by using AutoCAD commands (Line plan and detailed specifications are to be given by the Examiners).	D350.5	PO1,PO2, PO3,PO4, PO7
7. A	Draw the section of a "Load bearing wall" for a single storey building from parapet to foundation showing all the details across the section by using AutoCAD commands (Detailed specifications are to be given by the Examiners).	D350.3	PO1,PO2, PO3,PO4, PO7
B.	Draw the plan, section and elevation of a single storey "Double bed roomed building" with R.C.C roof to a suitable scale by using AutoCAD commands (Line plan and detailed specifications are to be given by the Examiners).	D350.4	PO1,PO2, PO3,PO4, PO7
8. A	Draw the cross section of the following structural rolled steel sections to a suitable by using AUTOCAD commands. a. "I" section b. Channel section c. Angle section (Details for the above sections are to be given by the examiners)	D350.4	PO1,PO2, PO3,PO4, PO7
B.	Draw the plan and section of a single storey "Primary school building" with R.C.C roof to a suitable scale by using AutoCAD commands (Line plan and detailed Specifications are to be given by the Examiners).	D350.5	PO1,PO2, PO3,PO4, PO7
9. A	Draw the cross section of the following structural rolled steel sections to a suitable scale by using AutoCAD commands. a. "T" section b. Tubular section c. Angle section (Details for the above sections are to be given by the examiners)	D350.4	PO1,PO2, PO3,PO4, PO7
B.	Draw the plan and section of a small "Workshop building" with steel columns, steel roof truss and metal sheet roofing to a suitable scale by using AutoCAD commands (Line plan and detailed specifications are to be given by the Examiners).	D350.5	PO1,PO2, PO3,PO4, PO7
10. A	Draw the cross section of any two types of "Compound beams" using in steel structures to a suitable scale by using AutoCAD commands (Details for the above sections are to be given by the examiners).	D350.4	PO1,PO2, PO3,PO4, PO7
B.	Draw the plan and section of a typical "Hospital building" with	D350.5	PO1,PO2,

	R.C.C roof to a suitable scale by using AutoCAD commands (Line plan and detailed specifications are To be given by the Examiners).		PO3,PO4, PO7
11. A	Draw the cross section of the following structural rolled steel sections to a suitable Scale by using AUTOCAD commands. a. "T" section b. Tubular section c. Angle section (Details for the above sections are to be given by the examiners)	D350.4	PO1,PO2, PO3,PO4, PO7
B	Draw the plan and section of a typical "Primary health center" with R.C.C roof to a suitable scale by using AutoCAD commands (Line plan and detailed specifications are To be given by the Examiners).	D350.4	PO1,PO2, PO3,PO4, PO7
12	Mini Project	D350.5	PO1,PO2, PO3,PO4, PO7

CED 360 MATERIAL TESTING LABORATORY I

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
MATERIALTESTING LABORATORY- I	3 Hrs	48Hrs	25	100*	100	3 Hrs.

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

DETAILLED ALLOCATION OF MARKS

SI.No	Description	Part - A Max. Marks (45)	Part - B Max. Marks (40)
1.	Procedure	5	5
2.	Tabulation and Observation	20	15
3.	Calculations	10	10
4.	Sketch / Graph	5	5
5.	Accuracy of result	5	5
7.	Viva	5	
6.	Mini Project	10	

Mini Project Evaluation (10 Marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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 a hands-on experience with the testing and evaluation of civil engineering materials, including steel, wood, Cements, Aluminium, Brass and Brick.

EQUIPMENTS REQUIRED

SI.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.
11.	Vicat's Apparatus	1 no.

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 OUTCOMES:

Course	**CED360 MATERIAL TESTING LABORATORY -I**
After successful completion of this course, the students will be able to	
D360.1	Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension and compression.
D360.2	Identify, formulate and solve engineering problems of structural elements subjected to flexure.
D360.3	Understand the tension test on steel.
D360.4	Analyze the compression tests on wood
D360.5	Analyze the flexural and torsion test to determine elastic constants and hardness of metals and develop the mini projects with report.

CED360 MATERIAL TESTING LABORATORY I

PART A

1. Tension test on mild steel/deformed steel bars.
2. Deflection test on Simply Supported Beams of

   a. wood and b. steel to find young's modulus
3. Torsion test on mild steel bar to determine the Modulus of Rigidity.
4. Double Shear test on M.S.bar.
5. Impact Test on mild steel by performing Izod/Charpy tests.
6. Find Brinnel's hardness numbers of the following materials.

   a. Mild steel b. Brass c. Aluminium
7. Find Rockwell's hardness numbers of the following materials.

   a. Mild steel b. Brass c. Aluminium

PART B

8. Compression Test on Wooden cube.
9. Compression test on Bricks.
10. Compression test on Solid Blocks.
11. Water absorption test on Bricks/pressed tiles.
12. Flexure test on Tiles.
13. Casting of cement mortar cubes and determining the normal consistency of cement.
14. Determining the compressive strength of cement Mortar cubes.
15. Mini Project

    The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITE:

1. https://lecturenotes.in/subject/156/material testing lab
2. Welcome to Virtual Labs - A MHRD Govt of india Initiative (vlabs.ac.in)
3. https://youtu.be/x-NEI4Sow6s
4. https://youtu.be/mMNE0U17v-E

CONTIUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure /observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D360.1	3	2	2	2	2	2	2	3	2	2
D360.2	3	2	2	2	2	2	2	3	2	2
D360.3	3	2	2	2	2	2	2	3	2	2
D360.4	3	2	2	2	2	2	2	3	2	2
D360.5	3	2	2	2	2	2	2	3	2	2
D360 Total	15	10	10	10	10	10	10	15	10	10
Correlation level	3	2	2	2	2	2	2	3	2	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high

CED 360 MATERIAL TESTING LABORATORY I

Model Question paper

Time: 3 hrs. Marks: 100

SI NO	Answer the Following Questions Answer All the questions from (part A; questions carries 40 marks) part B; questions carries 45 marks)	CO	PO
1. A	Conduct a tension test on the given M.S. Specimen and determine yield stress, breaking stress, ultimate stress, percentage elongation, and percentage reduction in area	D360.2	PO1,PO2,PO3, PO4,PO5,PO6,PO7
B	Conduct a compression test on the given wooden cube and find its ultimate strength parallel to its fibres	D360.4	PO1,PO2,PO3, PO4,PO5,PO6,PO7
2. A	Conduct a tension test on the given deformed steel bar and determine yield stress, breaking stress, ultimate stress, percentage elongation, and percentage reduction in area	D360.3	PO1,PO2,PO3, PO4,PO5,PO6,PO7
B	Conduct a compression test on the given brick / solid block and determine its ultimate compressive strength. Assuming a F.O.S find the permissible stress for the brick.	D360.2	PO1,PO2,PO3, PO4,PO5,PO6,PO7
3. A	Conduct a deflection test on the given M.S. beam and determine the value of Young's modulus of the material. Draw a graph "load Vs deflection"	D360.5	PO1,PO2,PO3, PO4,PO5,PO6,PO7
B	Conduct the compressive strength of the solid bricks sample and find the compressive strength of the blocks	D360.5	PO1,PO2,PO3, PO4,PO5,PO6,PO7
4. A	Conduct a deflection test on wooden beam and determine the value of Young's Modulus of wood. Draw a graph "load Vs deflection"	D360.4	PO1,PO2,PO3, PO4,PO5,PO6,PO7
B	Conduct water absorption test on brick and determine the percentage water absorption of brick in 20 minutes	D360.1	PO1,PO2,PO3, PO4,PO5,PO6,PO7
5. A	Conduct Torsion test on MS bar and determine the Modulus of Rigidity	D360.3	PO1,PO2,PO3, PO4,PO5,PO6,PO7
B	Conduct the water absorption test on the given sample and find out the percentage of water absorption of the sample	D360.1	PO1,PO2,PO3, PO4,PO5,PO6,PO7
6. A	Conduct a double shear test on the given steel rod and determine the ultimate shear strength of steel. Assuming a suitable F O S find the allowable shear stress	D360.3	PO1,PO2,PO3, PO4,PO5,PO6,PO7
B	Determine the flexural strength of the given tile by conducting a bending test	D360.2	PO1,PO2,PO3, PO4,PO5,PO6,PO7
7. A	Conduct impact test on mild steel specimen and determine the impact value of the material (Izod or Charpy)	D360.3	PO1,PO2,PO3, PO4,PO5,PO6,PO7
B	Conduct a compression test on the given wooden cube and find its ultimate strength parallel to its fibres.	D360.4	PO1,PO2,PO3, PO4,PO5,PO6,PO7
8. A	Conduct Brinell's hardness test and determine the BHN of mild steel	D360.5	PO1,PO2,PO3, PO4,PO5,PO6,PO7
B	Conduct a compression test on the given brick / solid block and determine its ultimate compressive strength. Assuming a F.O.S find the permissible stress for the brick	D360.4	PO1,PO2,PO3, PO4,PO5,PO6,PO7
9. A	Conduct Brinell's hardness test and determine the BHN of Aluminium	D360.3	PO1,PO2,PO3, PO4,PO5,PO6,PO7
B	Conduct the compressive strength of the solid bricks sample and find the compressive strength of the blocks	D360.4	PO1,PO2,PO3, PO4,PO5,PO6,PO7

10.A	Conduct Brinell's hardness test and determine the BHN of Brass	D360.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
B	Conduct water absorption test on brick and determine the percentage water absorption of brick in 20 minutes	D360.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
11.A	Determine the Rockwell Hardness Number of the given Aluminium.	D360.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
B	Conduct the water absorption test on the given sample and find out the percentage of water absorption of the sampl	D360.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
12.A	Conduct Rockwell's hardness test and determine the RHN of given Brass	D360.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
B	Determine the flexural strength of the given tile by conducting a bending test	D360.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
13.A	Conduct Rockwell's hardness test and determine the RHN of given Mild Steel	D360.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
B	Conduct a compression test on the given wooden cube and find its ultimate strength parallel to its fibers	D360.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
14	Mini Project	D360.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

CED370 SURVEYING PRACTICE I

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

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

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

DETAILED ALLOCATION OF MARKS

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

Mini Project Evaluation (10 Marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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

EQUIPMENTS REQUIRED

SI.NO	List of the Equipments	Quantity Required
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.
8.	Hand held GPS	6 nos.

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 OUTCOMES

Course	CED370 SURVEYING PRACTICE- I
After successful completion of this course the students should be able to	
D370.1	Analyze the chain, compass surveying and collect field data.
D370.2	Analyze the compass surveying and collect field data.
D370.3	Analyze the GPS Surveying from survey data
D370.4	Interpret survey data by levelling and compute areas and volumes.
D370.5	Learn the area calculation by the collected data's and develop the mini projects with report.

CED370 SURVEYING PRACTICE I

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 in accessible. 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)

Mini Project

The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper

LEARNING WEBSITES:

1. https://lecturenotes.in/subject/156/surveying-1-s-1
2. https://youtu.be/x9ZPMxrlS3U
3. welcome to virtual labs - a mhrd govt of india initiative (vlabs.ac.in)

CONTNUOUS INTERNAL ASSESSMENT:

Attendance	- 5 marks
Procedure /observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D370.1	3	3	3	3	3	2	3	3	3	2
D370.2	3	3	3	3	3	2	3	3	3	2
D370.3	3	3	3	3	3	2	3	3	3	2
D370.4	3	3	3	3	3	2	3	3	3	2
D370.5	3	3	3	3	3	2	3	3	3	2
D370 Total	15	15	15	15	15	10	15	15	15	10
Correlation level	3	3	3	3	3	2	3	3	3	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high

CED370 SURVEYING PRACTICE I

MODEL QUESTION PAPER

Time: 3 hrs. **Max. Marks: 100**

SI NO	Answer the Following Questions part A; questions carries 50 marks part B; questions carries 35 marks	CO	PO
1.A	(i). Run closed compass survey (between 5/6 station points) and find the included angles. Apply usual check. (35 Marks) (ii). Measure Latitude, Longitude and Altitude and locate the position of any three points in the College campus. Use Handheld GPS. (15 Marks)	D360.1 D360.3	PO1,PO2,PO3, PO4,PO5,PO6 PO7
B	Run Fly level connecting the following bench marks and reduce their levels by Height of Collimation method .Assume R.L of BM1 as 100.000m. (35Marks) 1. BM1 2. BM2 3. BM3 4. BM4 5. BM5 6. BM6 7. BM7 8. BM8 9. BM9 10. Close on the starting point.	D360.4	PO1,PO2,PO3, PO4,PO5,PO6 PO7
2.A	(i). Determine the distance between the two accessible points QR from the station point P. Use Prismatic Compass. (35 Marks) (ii). Mark waypoints of a route (Say College main building to Hostel building / College entrance to the Laboratory blocks etc.) and display the route map. Use Handheld GPS. (15 Marks)	D360.2 D360.3	PO1,PO2,PO3, PO4,PO5,PO6 PO7
B	Run Fly level connecting the following bench marks and reduce their levels by Rise and Fall method. Assume R.L of BM1 as 100.000m. (35Marks) 1. BM1 2. BM2 3. BM3 4. BM4 5. BM5 6. BM6 7. BM7 8. BM8 9. BM9 10. Close on the starting point.	D360.4	PO1,PO2,PO3, PO4,PO5,PO6 PO7

3.A	(i)Determine the distance between the two points PQ from the base line AB is inaccessible of length 5m/10m. Use Prismatic Compass. (35 Marks) (ii)Measure Latitude, Longitude and Altitude and locate the position of any three points in the College campus. Use Handheld GPS. (15 Marks)	D360.2 D360.3	PO1,PO2,PO3, PO4,PO5,PO6 PO7
B	Run Fly level connecting the following bench marks and reduce their levels by Height of Collimation method / Rise and Fall method. Assume R.L of BM1 as 100.000m. (35Marks) 1. BM1 2. BM2 3. BM3 4. BM4 - Inverted reading 5. BM5 6. BM6 7. BM7 - Inverted reading 8. BM8 9. BM9 10. Close on the starting point.	D360.4	PO1,PO2,PO3, PO4,PO5,PO6 PO7
4.A	(i). Run closed compass survey (between 5/6 station points) and find the included angles. Apply usual check. (35 Marks) (ii). Mark waypoints of a route (Say. College main building to Hostel building / College entrance to the Laboratory blocks etc.) and display the route map. Use Handheld GPS. (15Marks)	D360.1 D360.3	PO1,PO2,PO3, PO4,PO5,PO6 PO7
B	Conduct check leveling for the following bench marks and reduce their levels by Height of Collimation method / Rise and Fall method. Assume R.L of BM1 as 100.000m. (35Marks) 1. BM1 2. BM2 3. BM3 4. BM4 5. BM5 6. BM6 7. BM7 8. BM8 9. BM9 10. Close on the starting point.	D360.4	PO1,PO2,PO3, PO4,PO5,PO6 PO7
5.	Mini Project	D360.5	PO1,PO2,PO3 PO4,PO5,PO6 PO7

CED 310 MECHANICS OF SOLIDS

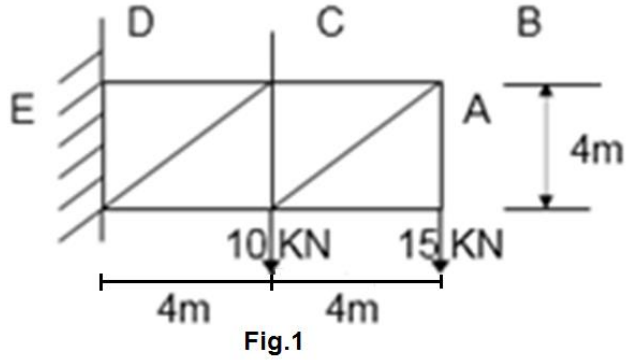
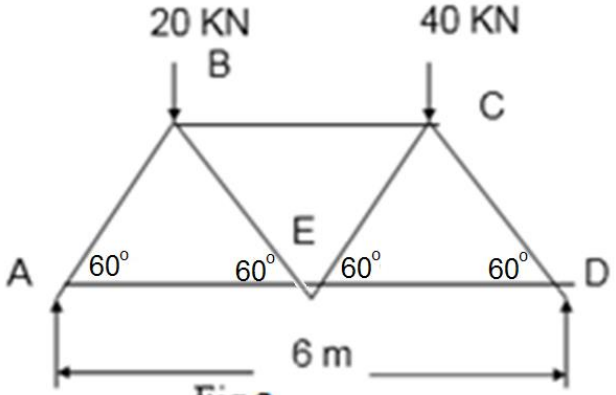
MODEL QUESTION PAPER

Time: 3 Hrs. **Max.Marks:100**

Note: Answer all the questions carry equal marks

PART- A						**(10 X 3 = 30 Marks)**
Note: Answer all questions .All questions carry equal marks.			**Unit**	**Bloom's Level**	**CO**	**PO**
1.	Differentiate Ultimate stress and Breaking stress.		I	U	D310.1	PO2,PO3
2.	Write the expression related with modulus of rigidity (g), bulk modulus (k) and Poisson's ratio (1/m).		I	R	D310.1	PO2,PO3
3.	What is the difference between sagging BM and hogging BM?		II	R	D310.2	PO2,PO3
4.	What is point of contra flexure? Differentiate cantilever and simply supported beam.		II	U	D310.2	PO2,PO3
5.	Define section modulus		III	R	D310.3	PO2,PO3
6.	State the position of centroid of a semi-circle.		III	R	D310.3	PO2,PO3
7.	Write an expression for the curvature of a beam from flexure equation.		IV	U	D310.4	PO2,PO3
8.	What is meant by flexural rigidity of a section?		IV	U	D310.4	PO2,PO3
9.	Write any four assumptions made while analyzing the framed structure.		V	U	D310.5	PO2,PO3
10.	When a pin jointed frame is called a redundant frame?		V	R	D310.5	PO2,PO3
PART- B						**(5 X 14 = 70 Marks)**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11. a	i) Differentiate the properties "rigidity" and "elasticity" of materials. ii) A brass bar of 10 mm diameter and 500 mm length is under an axial tension of 10 kN Its length increases by 0.8 mm and diameter reduces by 0.002 mm. Find the value of rigidity modulus of the material.	14	I	U AN	D310.1	PO1,PO2, PO3, PO6,PO7
(OR)						
b	A steel flat 150 mm wide 20 mm thick and 6000 mm long carries a pull of 300 kM find the extension in length and contraction in width and thickness under the pull. Take the Poisson's ratio as 0.3 and E = 2 x 105 N/mm^2. Calculate also the change in volume.	14	I	AN	D310.1	PO1,PO2, PO3, PO6,PO7

12. a	i) Discuss the different types of supports provided for horizontal beams. ii) A cantilever of 4m span carries a point load of 8 KN at the free end and an UDL of 3 KN/m over the half of the beam from the flexed end. Construct SFD and BMD.	14	II	R AN	D310.2	PO1,PO2, PO3, PO6,PO7
	(OR)					
b	A simply supported beam of 6 meter length is carries an udl of 20 kN/m over the left half of the beam. The beam also carries a point load of 30 KN at 2 m from right support. Draw the SF and BM diagrams for the beam.	14	II	AN	D310.2	PO1,PO2, PO3, PO6,PO7
13. a	i) State and prove the perpendicular axis theorem ii) An angle section 200 x 110 x 10 mm has a horizontal leg of 200 mm X 10 mm size and a vertical leg of 100 mm X 10 mm size. Find the position of centroid of the section.	14	III	R AN	D310.3	PO1,PO2, PO3, PO6,PO7
	(OR)					
b	Derive an expression for the moment of inertia of a circle about its centroidal axes and hence write expressions for section modulus and polar modulus of circle.	14	III	AN	D310.3	PO1,PO2, PO3, PO6,PO7
14 a	i). A cantilever of span 1.5 m carries a point load of 5 KN at the free end. Find the modulus of section required, if the bending stress is to exceed 150 N/mm^2. ii). Derive the formula for power transmitted by the shaft.	14	IV	AN AN	D310.4	PO1,PO2, PO3, PO6,PO7
	(OR)					
b	A hollow circular shaft of 120mm external dia and 80mm internal dia has a torque resisting capacity of 18kN.m. Determine the torque resisting capacity of a solid shaft of 60 mm dia of same material.	14	IV	AN	D310.4	PO1,PO2, PO3, PO6,PO7
15 a	Determine the magnitude and nature of the forces in all the members of the cantilever truss shown in the sketch by method of joints. (Any frame having less than 10 members)	14	V	AN	D310.5	PO1,PO2, PO3, PO6,PO7

	 Fig.1					
	(OR)					
b	Determine the forces in the members of the simply supported frame shown in the sketch by graphical method. (Any frame having less than 8 members).  Fig.2	14	V	AN	D310.5	PO1,PO2, PO3, PO6,PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as presented below:

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

****

CED 320 CONSTRUCTION MATERIALS AND CONSTRUCTION PRACTICE

MODEL QUESTION PAPER

Time: 3Hrs. **Max. Marks: 100**

Note : Answer all the questions carry equal marks

	PART- A				**(10 X 3= 30 Marks)**
	Note: Answer ALL questions .All questions carry equal marks.	**Unit**	**Bloom's Level**	**CO**	**PO**
1.	Write any four advantages of adding pozzolanas to cement.	I	R	D320.1	PO1,PO2,PO3
2.	Define cement mortar.	I	U	D320.1	PO1,PO2
3.	What is sub structure and super structure?	II	R	D320.2	PO1,PO2,PO3
4.	Define pile and name the types of pile.	II	U	D320.2	PO1,PO2,PO3
5.	What is the purpose of providing hold fast in doors?	III	R	D320.3	PO1,PO2,PO3
6.	What are the materials used for damp proofing?	III	R	D320.3	PO1,PO2,PO3
7.	Name the factors affecting the bearing capacity of soil.	IV	U	D320.4	PO1,PO2,PO3
8.	What are the types of flooring?	IV	R	D320.4	PO1,PO2
9.	State any five requirements of good formwork.	V	U	D320.5	PO1,PO2
10.	Define scaffolding and formwork.	V	U	D320.5	PO2,PO3

	PART- B					**(5X14=70 Marks)**
	Note: i). Answer all Questions choosing either division (A) or division (B) of each question. **ii). All divisions carry equal marks.**					
11. a	What are the various stages in the manufacture of brick and explain them?	14	I	R	D320.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	(OR)					
b	Describe Fat lime, hydraulic lime and poor lime.	14	I	U	D320.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
12. a	What are the functions of cement and water in concrete and describe the properties of a mortar.	14	II	R	D320.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7

(OR)						
b	Explain in detail the types of metals used in building construction.	14	II	U	D320.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
13. a	Explain about under reamed piles with neat sketch.	14	III	U	D320.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	Define any ten common terms used in stone masonry	14	III	U	D320.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
14. a	Explain in detail about the component parts of a door with neat sketch.	14	IV	U	D320.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	Sketch and Explain (a) Dog legged stairs (b) Spiral stairs.	14	IV	U	D320.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
15. a	List out the technical terms used in pitched roof with a neat sketch and define each.	14	V	U	D320.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	Explain in detail about scaffolding and its types with neat sketch.	14	V	U	D320.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as presented below:

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

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CED 330 SURVEYING

MODEL QUESTION PAPER

PART- A						(10X3=30 Marks)
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**Bloom's Level**	**CO**		**PO**
1.	Define any two terms used in chain surveying.	I	U	D330.1		PO2,PO3
2.	What is fore bearings and back bearings?	I	U	D330.1		PO2,PO3
3.	Draw a neat sketch of dumpy level and mark its components.	II	U	D330.2		PO2,PO3
4.	What is back site and fore site?	II	R	D330.2		PO2,PO3
5.	What are the component parts of transit theodolite?	III	U	D330.3		PO2,PO3
6.	What is transit and non transit theodolite?	III	R	D330.3		PO2,PO3
7.	Write down the formula to determine constant of tacheometric surveying.	IV	U	D330.4		PO2,PO3
8.	What are the uses of tacheometry surveying?	IV	R	D330.4		PO2,PO3
9.	What is total station?	V	R	D330.5		PO2,PO3,PO4
10.	What are the applications of GPS?	V	U	D330.5		PO2,PO3
PART- B						**(5X14=70) Marks**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11 a	Explain in detail about direct and indirect ranging.	14	I	U	D330.1	PO1,PO2, PO3,PO4, PO5,PO6,
(OR)						
b	Describe with neat sketch about prismatic compass.	14	I	U	D330.1	PO1,PO2, PO3,PO4, PO5,PO6,
12. a	The following staff readings were taken with a dumpy level 3.125, 1.800, 2.265, 2.320, 1.920, 2.655, 1.040, 3.205, 1.620, 3.625 and 1.480. The level was shifted after the second, sixth and eighth readings. The first reading was taken on a benchmark of R.L 123.680. Enter the reading in a level book form and reduce the levels of all the points by rise and fall method. Apply the usual check.	14	II	AP	D330.2	PO1,PO2, PO3,PO4, PO5,PO6, PO7
(OR)						

<table>
<tr><td>b</td><td>What are the steps involved in leveling operation?</td><td>14</td><td>II</td><td>U</td><td>D330.2</td><td>PO1,PO2, PO3,PO4, PO5</td></tr>
<tr><td>13 a</td><td>Draw a neat sketch of transit theodolite and write their functions.</td><td>14</td><td>III</td><td>U</td><td>D330.3</td><td>PO1,PO2, PO3,PO4, PO5</td></tr>
<tr><td colspan="7">(OR)</td></tr>
<tr><td>b</td><td>The following are the latitudes and departures of a closed traverse ABCDE. Calculate the Consecutive and Independent Coordinates of all the stations.

<table><tr><th>Line</th><th>Latitude</th><th>Departure</th></tr><tr><td>AB</td><td>+15.23</td><td>+193.50</td></tr><tr><td>BC</td><td>+194..34</td><td>+52.07</td></tr><tr><td>CD</td><td>+44.20</td><td>-159.38</td></tr><tr><td>DE</td><td>-166.32</td><td>-46.13</td></tr><tr><td>EA</td><td>-87.45</td><td>-40.06</td></tr></table></td><td>14</td><td>III</td><td>AP</td><td>D330.3</td><td>PO1,PO2, PO3,PO4, PO5,PO6, PO7</td></tr>
<tr><td>14 a</td><td>Explain Direct reading Tacheometric surveying.</td><td>14</td><td>IV</td><td>U</td><td>D330.4</td><td>PO1,PO2, PO3,PO4, PO5,PO6, PO7</td></tr>
<tr><td colspan="7">(OR)</td></tr>
<tr><td>b</td><td>.
i) State any five uses of contour maps.</td><td>4</td><td>IV</td><td>U</td><td>D330.4</td><td>PO1,PO2, PO3,PO4, PO5,PO6, PO7</td></tr>
<tr><td></td><td>ii. The area within the contour lines at the site of a reservoir and along the face of the proposed dam is as follows:
<table><tr><td>Contour (m)</td><td>490</td><td>495</td><td>500</td><td>505</td><td>510</td><td>515</td><td>520</td></tr><tr><td>Area (sq.m)</td><td>24000</td><td>32500</td><td>34750</td><td>36800</td><td>39500</td><td>41000</td><td>42250</td></tr></table>Take 490m as the bottom level of the reservoir and calculate the capacity of reservoir by Trapezoidal</td><td>10</td><td>IV</td><td>AP</td><td>D330.4</td><td>PO1,PO2, PO3,PO4, PO5,PO6, PO7</td></tr>
</table>

	rule and Prismoidal formula.					
15 a	Explain the features of total station and write short notes on three accessories used in total station.	14	V	U	D330.5	PO1,PO2, PO3,PO4, PO5,PO6, PO7
(OR)						
b	Explain field applications of GIS.	14	V	U	D330.5	PO1,PO2, PO3,PO4, PO5,PO6, PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as presented below:

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

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CED 340 BUILDING PLANNING AND DRAWING

MODEL QUESTION PAPER

Time: 3Hrs. Max. Marks: 100

N.B. 1. Answer all questions under Part A in the drawing sheet supplied.
2. Answer question under Part B in the drawing sheet supplied.
3. The sketches under Part A should be drawn using pencil and drawing instruments, not necessarily to scale.
4. Any data, not given may be assumed suitably and should be indicated in the drawing.

PART- A						**(2 x 4 =8 MARKS)**
Note: Answer ALL questions .All questions carry equal marks.		**Marks**	**Unit**	**Bloom's Level**	**CO**	**PO**
1.	What is the main factor to be considered while planning?	4	I	R	D340.1	PO1,PO2, PO3,PO5, PO7
2.	Specify the minimum dimension for a living room in residential building as per the NBC standards.	4	II	R	D340.2	PO1,PO2, PO3,PO5, PO7
						(1x12 =12 MARKS)
3.	Sketch the elevation of a steel truss using the following details Wall thickness : 300 mm Bottom tie member : 2 Nos flat 80 X 6 mm Pitch of roof: 30 Strut : Single ISA 70 X45 X 8 mm Principal rafter : Two ISA 80 X 50 X 8 mm Cleat angle : 75 X 75 X 8 mm Purlins : 125 X75 X 8mm All other ties : 60 mm X 10 mm flat Roof covering: G.I. Sheet Gusset Plate : 10 mm thick	12	III	AP	D340.3	PO1,PO2, PO3,PO5, PO7
	PART- C					**(1X80=80 MARKS)**
4.	Specifications: The following Specifications corresponding to the line plan of "A Primary health centre for rural area with R.C.C flat roof". 1. **FOUNDATION:** The foundation for all main walls will be in C.C 1:4:8 mix, 900 wide and 300mm tk, laid at 1500mm below ground level. The masonry footings will be in brick work in C.M 1:6, the first footing being 600 X	80	IV	AN	D340.4	PO1,PO2, PO3,PO5, PO7

	450 and the second being 450 x 450 for all main walls and verandah retaining wall. 2. **BASEMENT**: The basement will be in brickwork in C.M 1:5, 380 wide and 600 tk above ground level for all main walls and verandah retaining wall. It is filled with clean sand to a depth of 450mm.A damp proof course, in C.M 1:3, 20 mm tk will be provided for all walls at basement level. 3. **SUPERSTRUCTURE**: All main walls will be in brick work in C.M 1:5, using stocks bricks 230mm tk. The height of all main walls 3050mm above floor level. Parapet walls 230mm tk and 600mm high provided for all main walls. 4. **ROOFING:** The roofing will be of R.C.C 1:1.5:3 mix, 150mm tk. A weathering course 7.5mm tk. 5. **LINTEL**: All internal wall openings will be provided with R.C.C lintel 1:1.5:3 mix, 150mm tk. All the external openings will be provided with R.C.C. lintel cum sunshade of 1:2:4 mix 450 mm wide. 6. **FLOORING**: The flooring will be in cement concrete 1:4:8,120mm thick, the top plastered smooth with C.M 1:3, 30mm tk for all the portions. 7. **STEPS:** Steps will be in brickwork in cement mortar 1:5 .Rise = 200mm, Tread=300mm.					

Note:-

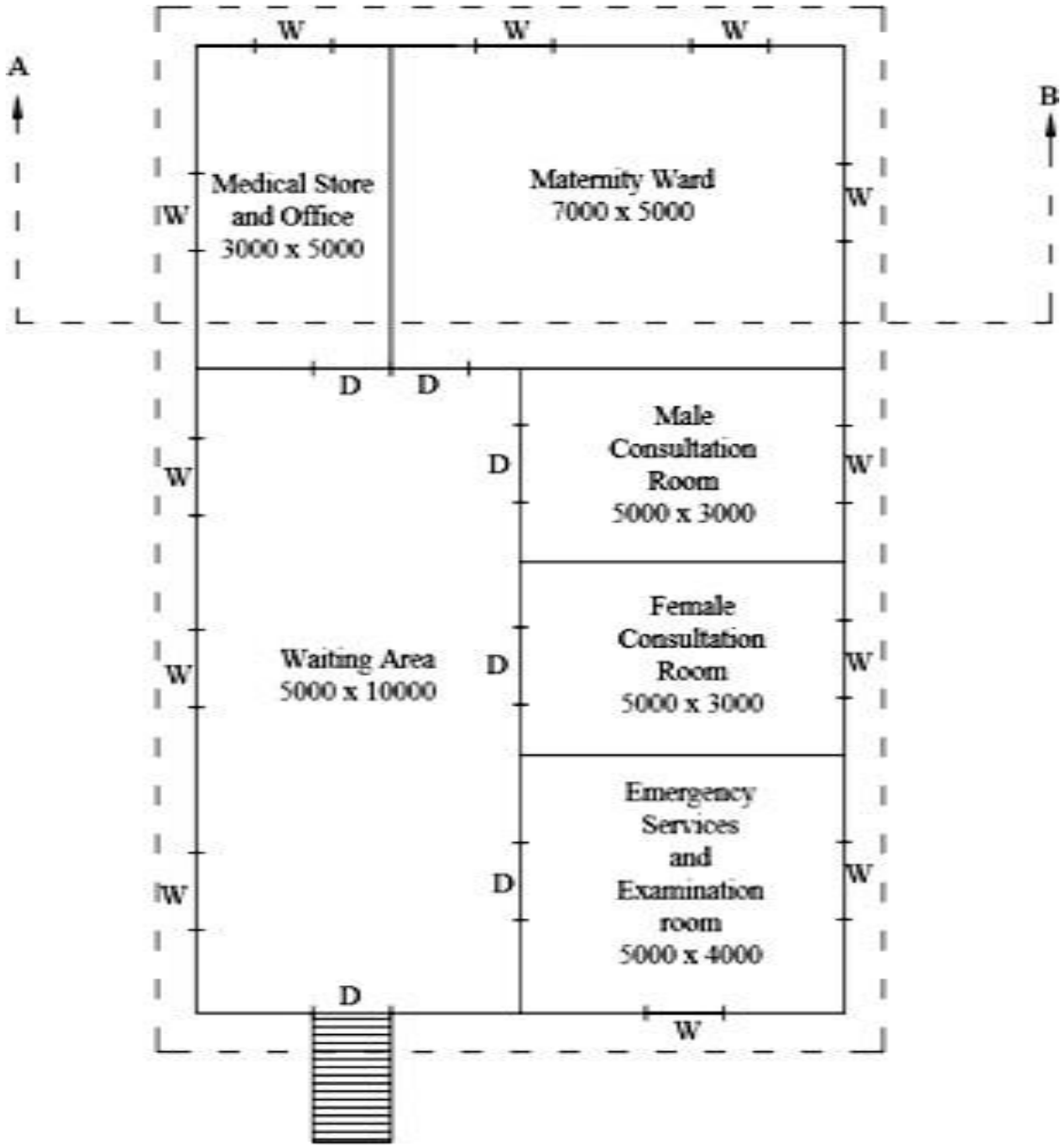
1 Any other dimensions found necessary may be assumed suitably making clear indications of the same.

2 All dimension indicated in millimeters.

Draw to a suitable scale: - (1:100)

1. Plan of the building. - 35
2. Sectional elevation on "AB" - 30
3. Front elevation. - 15

Line Plan of a Primary Health Centre



QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as presented below:

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

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DETAILLED SYLLABUS –IV SEMESTER

CED 410 THEORY OF STRUCTURES

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examinations			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
THEORY OF STRUCTURES	**6 Hrs**	**96Hrs**	**25**	**100***	**100**	**3 Hours**

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

TOPICS AND ALLOCATION OF HOURS

UNIT	TOPICS	NO. OF HOURS
I	Slope and Deflection of Beams Propped Cantilevers	17
II	Fixed Beams Continuous Beams - Theorem of Three Moments Method	17
III	Continuous Beams - Moment Distribution Method Portal Frames - Moment Distribution Method	18
IV	Columns And Struts Combined Bending And Direct Stresses	18
V	Masonry Dams Earth Pressure And Retaining Walls	17
	Tests And Model Exam	9
Total		**96**

COURSE DESCRIPTION:

Study of structural behavior, analysis and design is a principal part of civil engineering courses and is essential for professional accreditation. This subject enhances the structural analytical ability of the students.

OBJECTIVES:

On completion of the course, the student will be familiar with:

- Determine the Slope and Deflection of Determinate beams by area moment method.
- Analyse Propped cantilevers and fixed beams by Area-Moment method and draw SFD, BMD.
- Analyse Continuous beams by Theorem of Three moments and draw SFD, BMD.
- Analyse Continuous beams, Portal frames and Substitute frames by Moment Distribution Method and draw SFD, BMD.
- Define different types of Columns and find critical loads of Columns.
- Analyse Columns and Chimneys subject to eccentric loading / moment / horizontal loads and find maximum and minimum combined stresses in their sections.

- Calculate maximum and minimum bearing pressures and check the stability of Masonry Dams and Retaining walls.

COURSE OUTCOMES:

Course	**CED410 THEORY OF STRUCTURES**
After Successful of this completion of this course , the students should able to	
D410.1	Calculate slope and deflection of various beams of simple structures and find the SF and BM diagram by area moment method.
D410.2	Apply the area moment method for fixed beams and theorem of three moment's method for continuous method.
D410.3	Analyse the moment distribution method for continuous beams and portal frames.
D410.4	Understand the different load conditions for various columns.
D410.5	Calculate the bearing pressure and check the stability of masonry dam.

CED410 THEORY OF STRUCTURES

UNIT I **[17Hrs]**

1.1 SLOPE AND DEFLECTION OF BEAMS

Deflected shapes / Elastic curves of beams with different support conditions – [1 Hr]

Definition of slope and deflection flexural rigidity and stiffness of beams – Mohr's Theorems [2 Hrs]

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 [2 Hrs]

For cantilever and simply supported beams subjected to symmetrical UDL & point loads [2 Hrs]

Numerical problems on determination of slopes and deflections at salient points of Cantilevers and Simply supported beams from first principles and by using formulae. [2 Hrs]

1.2 PROPPED CANTILEVERS

Statically determinate and indeterminate Structures Stable and Unstable Structures. [2 Hrs]

Examples- Degree of Indeterminacy-Concept of Analysis of Indeterminate beams [2 Hrs]

Definition of Prop–Types of Props- Prop reaction from deflection consideration [2 Hrs]

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. [2 Hrs]

UNIT II

2.1 FIXED BEAMS – AREA MOMENT METHOD **[17Hrs]**

Introduction to fixed beam - Advantages Degree of indeterminacy of fixed Beam [1 Hr]

Sagging and Hogging bending moments -Determination of fixing end (support) moments(FEM)by area Moment method- [2 Hrs]

Derivation of Expressions for Standard cases - Fixed beams subjected to symmetrical and unsymmetrical concentrated loads and UDL- [2 Hrs]

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)- [1 Hr]

Points of Contra flexure –Problems- Determination of Slope and Deflection of fixed beams subjected to only symmetrical loads by area moment method – Problems. [2 Hrs]

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 [2 Hrs]

Simple/Partially fixed / Fixed supports of beams- General methods of analysis of Indeterminate structures- [1 Hr]

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 [2 Hrs]

Two span beams with one end fixed and the other end simply supported – Two span beams with one end simply supported or fixed and other end overhanging [2 Hrs]

Determination of Reactions at Supports- Application of Three moment equations to Three span Continuous Beams and Propped cantilevers –Problems-Sketching of SFD [2 Hrs]

and BMD for all the above cases.

UNIT – III

3.1 CONTINUOUS BEAMS - MOMENT DISTRIBUTION METHOD **[18Hrs]**

Introduction to Carry over factor, Stiffness factor and Distribution factor –Stiffness Ratio or Relative Stiffness [2 Hrs]

Concept of distribution of un balanced moments at joints – Sign conventions [2 Hrs]

Application of M-D method to Continuous beams of two / three spans and to Propped cantilever (Maximum of three cycles of distribution sufficient) – [2 Hrs]

Finding Support Reactions- Problems [2 Hrs]

Sketching SFD and BMD for two / three span beams. [2 Hrs]

3.2 PORTAL FRAMES – MOMENT DISTRIBUTION METHOD

Definition of Frames – Types – Bays and Storey – Sketches of Single/Multi Storey [2 Hrs]

Frames, Single/Multi Bay Frames- Portal Frame – Sway and Non- sway Frames [2 Hrs]

Analysis of Non sway(Symmetrical) Portal Frames for Joint moments by Moment Distribution Method and drawing BMD only [2 Hrs]

Deflected shapes of Portal frames under different loading / support conditions. [2 Hrs]

UNIT – IV

4.1 COLUMNS AND STRUTS **[18Hrs]**

Columns and Struts – Definition – Short and Long columns –End conditions [2 Hrs]

Equivalent length / Effective length–Slenderness ratio [1 Hr]

Axially loaded short column – Axially loaded long column – Euler's theory of long columns [2 Hrs]

Derivation of expression for Critical load of Columns with hinged ends –Expressions for other standard cases of end conditions(separate derivations not required)- problems - [2 Hrs]

Derivation of Rankine's formula for Crippling load of Columns– Factor of Safety- Safe load on Columns- Simple problems. [2 Hrs]

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 [2 Hrs]

Combined direct and bending stresses – Maximum and Minimum stresses in Sections–Problems – Conditions for no tension [2 Hrs]

Limit of eccentricity –Middle third rule – Core or Kern for square, rectangular and circular sections – Chimneys subjected to uniform wind pressure [2 Hrs]

Combined stresses in Chimneys due to Self weight and Wind load- [2 Hrs]

Chimneys of Hollow square and Hollow circular cross-sections only – Problem [1 Hr]

UNIT– V

[17Hrs]

5.1 MASONRY DAMS

Gravity Dams – Derivation of Expression for maximum and minimum stresses at Base – Stress distribution diagrams [2 Hrs]

Problems – Factors affecting Stability of masonry dams [2 Hrs]

Factor of safety- Problems on Stability of Dams– [2 Hrs]

Minimum base width and maximum height of dam for no tension at base [1 Hr]

Elementary profile of a dam – Minimum base width of elementary profile for no tension- middle third rule [2 Hrs]

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 [2 Hrs]

Rankine's theory of earth pressure – Assumptions [2 Hrs]

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) [2 Hrs]

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. [2 Hrs]

Tests & Model Exam **[9Hrs]**

TEXT BOOK:

SI.NO	TITLE	AUTHOR	PUBLISHER&EDITION
1.	Theory of structures	S.Ramamirtham	S.Chand & CompanyLtd, New Delhi. 2002
2.	Theory of structures	B.C.Punmia	Laxmi Publication 9th Edition April1992

REFERENCE BOOK:

SI.NO	TITLE	AUTHOR	PUBLISHER&EDITION
1.	Mechanics of Structures Vol II	S.B.Junnarkar	Charator publishing 22nd Edition 1997
2.	Structural Analysis	Madhan Mohan Dass	PHI Learning Pvt. Ltd, New Delhi. 2004

LEARNING WEBSITES

1. https://youtu.be/aRgLsT6GZrg
2. Organization Theory/Structure and Design - Course (nptel.ac.in)
3. https://youtube.videoken.com/embed/s4CN6aVKhPo
4. https://youtu.be/aRgLsT6GZrg

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Assignment	-5 marks
Tests	-10 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D410.1	3	3	3	2	2	-	2	3	2	3
D410.2	3	3	3	2	2	-	2	3	2	3
D410.3	3	3	3	2	2	-	2	3	2	3
D410.4	3	3	3	2	2	-	2	3	2	3
D410.5	3	3	3	2	2	-	2	3	2	3
D410 Total	15	15	15	10	10	-	10	15	10	15
Correlation level	3	3	3	2	2	-	2	3	2	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING:

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consider have 90% questions based on Lower Order Thinking (LOT'S) and the remaining 10% based on Higher Order Thinking (HOT'S) as detailed below:

Bloom's taxonomy level	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED420 HYDRAULICS

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examinations			
			Marks			Duration
	Hours / Week	Hours / Semester	Internal Assessment	Autonomous Examination	Total	
HYDRAULICS	**6Hrs**	**96Hrs**	**25**	**100***	**100**	**3 Hours**

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

TOPICS AND ALLOCATION OF HOURS

UNIT	TOPICS	NO. OF HOURS
I	Introduction Measurement of Pressure Hydrostatic Pressure On Surfaces	19
II	Flow of Fluids Flow Through Orifices and Mouthpieces Flow Through Pipes	19
III	Flow Through Notches Flow Through Weirs	16
IV	Flow Through Open Channels	15
V	Pumps	18
	Tests And Revision	9
TOTAL		**96**

COURSE DESRIPTION:

Course 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 flow fluid problems.

OBJECTIVES:

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

- To define the properties of fluids and their physical quantities.
- To list different types of pressures and various pressure measuring devices. To calculate hydrostatic forces on plane surfaces immersed in water.
- To explain types of forces, energy and application of Bernoulli's theorem. To describe different types of Orifices and Mouthpieces and to derive
- Discharge formulae and their practical applications.
- To state the different losses of head of flowing liquids in pipes and their equations

- To describe different types of Notches and Weirs, and deriving the discharge formulas and their Practical applications.
- To describe different types of Channels and their discharge formulas and to determine the condition for maximum discharge;.
- To explain the procedure of Canal Linings and explain the different forms of ground water resources
- To explain the construction details, specifications and efficiencies of Reciprocating Pumps and Centrifugal Pumps.

COURSE OUTCOMES:

Course	**CED420 HYDRAULICS**
After Successful of this completion of this course , the students should able to	
D420.1	Describe different types of pressure and methods of measurement
D420.2	Learn the flow of fluids and flow through pipes.
D420.3	Calculate discharge through notches and weir.
D420.4	Understand the flow through open channels.
D420.5	Design the working proportions of hydraulic machines and know the ground water.

CED420 HYDRAULICS

UNIT I **[19Hrs]**

1.1 INTRODUCTION

Hydraulics – Definition - Properties of fluids - Mass, force, weight specific volume, specific gravity, specific weight, density, relative density [2 Hrs]

compressibility, viscosity, cohesion, adhesion, capillarity and surface tension [2 Hrs]

Dimensions and Units for area, volume, specific volume, velocity, Acceleration, density, discharge, force, pressure and power. [2 Hrs]

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 – simple problems-types of pressure [3 Hrs]

Static pressure, Atmospheric pressure, gauge pressure ,vacuum pressure and Absolute pressure – Simple problems - Measurement of pressure - Simple mercury barometer - [2 Hrs]

Pressure measuring devices- Piezometer tube - Simple U-tube manometer – Differential manometer – Micrometer – Problems [2 Hrs]

1.3 HYDROSTATIC PRESSURE ON SURFACES

Pressure on plane surfaces - Horizontal, vertical and inclined surfaces [2 Hrs]

Total pressure-Centre of pressure - Depth of centre of pressure [2 Hrs]

Resultant pressure – Problems on Practical application - Sluice gates, Lock gates and Dams- Descriptions [2 Hrs]

UNIT II **[19Hrs]**

2.1 FLOW OF FLUIDS

Types of flow – laminar and Turbulent flow-Steady 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 [3 Hrs]

Pressure energy and Pressure Head - Kinetic Energy and Kinetic Head- Total Energy and Total Head – Bernoulli's theorem – (No proof) [3 Hrs]

Problems on Practical applications of Bernoulli's theorem- Venturimeter- Orifice meter (Derivation not necessary) simple problems [3 Hrs]

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 [3 Hrs]

Practical applications of orifices– Types of mouthpieces - External and Internal mouthpieces Discharge formula - Simple problems. [2 Hrs]

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) [2 Hrs]

Simple problems – Energy / Head losses of flowing fluid due to friction –Darcy's equation-Chezy's equation(no derivation) – problems -Transmission of power through pipes- [1 Hr]

Efficiency - Pipes in parallel connected to reservoir - Discharge formula –Simple problems. [2 Hrs]

UNIT - III **[16Hrs]**

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. [3 Hrs]

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 [3 Hrs]

Franci's and Bazin's formula – Simple problems - Cippoletti weir [2 Hrs]

Problems -Narrow crested weir – Sharp crested weir with free over fall [2 Hrs]

Broad crested weir - Drowned or Submerged weirs - Suppressed weir- Stepped weir [2 Hrs]

Problems - Definition of terms - Crest of sill, Nappe or Vein, [2 Hrs]

Free discharge - Velocity of approach – Spillways and Siphon spillway -Definition. [2 Hrs]

UNIT –IV **15 Hrs**

4.1 FLOW THROUGH OPEN CHANNELS

Definition - Classification - Rectangular and Trapezoidal channels – Discharge – Chezy's formula [2 Hrs]

Bazin's formula and Manning's formula - Hydraulic mean depth – Problems [2 Hrs]

Conditions of rectangular/trapezoidal sections - Specific energy, critical depth [2 Hrs]

Conditions of maximum discharge and maximum velocity [1 Hr]

Problems - Flow in a venture flume –Uniform flow in channels – Flow through a sluice gate – Types of channels [2 Hrs]

Typical cross- sections of irrigation canals - Methods of measurements of velocities – [2 Hrs]

Channel losses - Lining of canals – Advantages of lining of canals –Types of lining [2 Hrs]

Cement concrete lining with sketches – Soil cement lining with sketches– LDPE lining [2 Hrs]

UNIT - V **[18Hrs]**

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. [2 Hrs]

Maximum recommended suction, lift and power consumed-Reciprocating pump - [2 Hrs]

Construction detail and working principle - Types - Single acting and Double acting -Slip -Air vessels-Discharge and Efficiency- Problems [2 Hrs]

Centrifugal pump – Advantages and disadvantages over a reciprocating pump Layout -Construction details – Priming of centrifugal pump – Working of the pump [2 Hrs]

Classification – Functions of Foot valve, Delivery valve and Non-return valve – Fundamental equation of centrifugal pump [2 Hrs]

Characteristics of a centrifugal pump – Discharge, power and efficiency –Problems - Specifications of centrifugal pumps and their sections [2 Hrs]

Characteristics of a centrifugal pump – Discharge, power and efficiency – Problems - Specifications of centrifugal pumps and their sections [2 Hrs]

Hand pump - Jet pump-Deep well pump - Plunger pumps - Piping system- [2 Hrs]

Computation of power required for pumps other types of pumps (not for exam)- selection and choice of pump. [2 Hrs]

Tests & Model Exam **[9Hrs]**

TEXT BOOKS:

SI. NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Hydraulics , Fluid mechanics and hydraulic machines	Ramamirtham	Dhanpat Rai & Sons New Delhi 2010
2.	Fluid Mechanics	K.L.Kumar	Eurasa Publishing House New Delhi 2006
3.	Fluid Mechanics	R.K. Bansal	Lakshmi Publications 2002

REFERENCE BOOKS:

SI. NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Hydraulics, Fluid Mechanics and Hydraulic Machines	Dr. Jagadish Lal	Metropolitan Book company New Delhi,1998
2.	Fluid Mechanics	P.N. Modi& S.M. Sethi	Standard Publisher New Delhi 2004
3.	Fluid Mechanics	Prof. S. Nagarathinam	Khanna Publisher New Delhi 2010

LEARNING WEBSITES

1. NPTEL :: Civil Engineering - Hydraulics
2. PowerPoint Presentation (nptel.ac.in)
3. https://youtu.be/xmkh7M9R7nM

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Assignment	-5 marks
Tests	-10 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D420.1	3	3	3	2	2	3	2	3	2	3
D420.2	3	3	3	2	2	3	2	3	2	3
D420.3	3	3	3	2	2	3	2	3	2	3
D420.4	3	3	3	2	2	3	2	3	2	3
D420.5	3	3	3	2	2	3	2	3	2	3
D420 Total	15	15	15	10	10	15	10	15	10	15
Correlation level	3	3	3	2	2	3	2	3	2	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING:

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consider of 90% questions based on Lower Order Thinking (LOT'S) and the remaining 10% based on Higher Order Thinking (HOT'S) as detailed below:

Bloom's taxonomy level	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED430 TRANSPORTATION ENGINEERING

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examinations			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
TRANSPORTATION ENGINEERING	5 Hrs.	80 Hrs.	25	100*	100	3 Hrs.

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

TOPICS AND ALLOCATION OF HOURS

UNIT	TOPICS	NO.OF HOURS
I	Highway Engineering	14
II	Highway Engineering (Contd.)	14
III	Railway Engineering	15
IV	Railway Engineering (Contd.)	14
V	Bridge Engineering	14
	Tests & Model Exam	9
	Total	**80**

COURSE DESCRIPTION:

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, Road Arboriculture and Highway Lighting
- Study the highway alignment, road machineries and construction of different types of Roads
- Study the Railway fixtures, Types of stations, Signaling and Control of movement of trains
- Study the Maintenance of Track and Rapid Transport System of Railways
- Know about Bridges, Classifications and its Components

COURSE OUTCOME:

Course	**CED430 TRANSPORTATION ENGINEERING**
After Successful of this completion of this course , the students should able to	
D430.1	Understand concept of Geometric design of roads and various aspects of traffic engineering and analysis and use the data for road design.
D430.2	Understand various highway materials and their types of road & under different conditions.
D430.3	Gain knowledge about various concepts in railway design and components of railway track
D430.4	Analyse the construction process, maintenance and operation of railway engineering
D430.5	Understand the various components and classifications of bridge structures.

CED430 TRANSPORTATION ENGINEERING

UNIT I

HIGHWAY ENGINEERING **[14 Hrs]**

1.1 INTRODUCTION

General – Development of Roads in India - Modes of transportation - Nagpur Plan - Ribbon development - Advantages of Roads [2 Hrs]

Importance of roads in India - Requirements of an ideal road - Indian Road Congress [1 Hr]

Objects of Highway planning - Classifications of Highways. [1 Hr]

1.2 HIGHWAY PAVEMENTS

Objectives - Types of Pavement - Flexible and Rigid Pavements - Comparative study of Flexible and Rigid pavements [1 Hr]

Factors affecting the design of pavements - Other types of pavements (Description not reqd.) [1 Hr]

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 [2 Hrs]

1.4 TRAFFIC ENGINEERING

Objectives - Traffic surveys - Road accidents - Causes of road accidents - Preventive measures - Parking - Methods of parking -Road junctions [2 Hrs]

(Grade intersections and Grade separators) - Traffic signals - Advantages - Types of road signs –Expressways

1.5 SUB GRADE SOIL

Significance - Soil mass as a three phase system - Grain size classification - Atterberg limits - Definition and description - I S Classification of soils - Compaction - Definition - Objects of compaction - Standard Proctor Compaction test - Shear strength - Definition - importance - Direct shear test. [2 Hrs]

1.6 ROAD ARBORICULTURE AND LIGHTING

Objects of Arboriculture - Selection of trees - Location of trees - Highway lighting - Benefits. [2 Hrs]

UNIT II

HIGHWAY ENGINEERING (Contd.) **[14 Hrs]**

2.1 HIGHWAY ALIGNMENT AND SURVEYS

Definition - Principles for ideal highway alignment - Factors affecting highway [2 Hrs]

alignment - Surveys - Engineering surveys - Reconnaissance,

Preliminary and Location surveys - Project Report and Drawings - Highway Re-alignment projects. [2 Hrs]

ROAD MACHINERIES

Excavating equipments - Tractor, Bull dozer, Grader, Scraper, J C B - Compaction equipments - Road roller - Types and description - Equipment for Bituminous road. [2 Hrs]

LOW COST ROADS

General - Classifications - Earthen road, Gravel road, Water Bound Macadam roads - Construction with sketches - Advantages and disadvantages - Maintenance - Soil stabilization -Methods. [2 Hrs]

2.4 BITUMINOUS ROADS

General - Advantages and disadvantages - Bituminous materials used - Types of Bituminous roads - Surface dressing - Types - Bituminous Concrete - Maintenance of Bituminous roads. [2 Hrs]

2.5 CEMENT CONCRETE ROADS

General - Advantages and disadvantages - Methods of construction of cement concrete roads with sketches - Construction procedure for concrete roads [2 Hrs]

2.6 HILL ROADS

Factors considered in alignment - Formation of hill roads - Hair pin bends - Retaining and Breast walls. [2 Hrs]

UNIT III **[15 Hrs]**

RAILWAY ENGINEERING

3.1 INTRODUCTION

Introduction to Railways - Classifications of Indian Railways – Rail Gauges - Types - Uniformity in gauges - Loading gauge -Construction gauge. [2 Hrs]

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 - [2 Hrs]

Coning of wheels - Hogged rails - Bending of rails - Creep of rails - Causes and prevention of creep. [2 Hrs]

3.3 SLEEPERS AND BALLAST [2 Hrs]

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. [2 Hrs]

3.4 RAIL FASTENINGS AND PLATE LAYING

Rail joints - Types - Rail fastenings - Fish plates - Fish bolts Spikes –Chairs and Keys - Bearing plates - Blocks- Elastic [2 Hrs]

Fastenings - Anchors and anti-creepers - Plate laying Methods of plate laying - PQRS method of relaying. [2 Hrs]

3.5 MAINTENANCE OF TRACK

Necessity - Maintenance of Track, Bridges and Rolling stock. [1 Hr]

UNIT IV

RAILWAY ENGINEERING(Contd.) [14 Hrs]

4.1 STATIONS AND YARDS

Definition of station - Purpose of railway station - Types of stations -Wayside, Junction and Terminal stations - Platforms – Passenger [2 Hrs]

and Goods platforms - Definition of Yard - Types of yard -Passenger yard, Goods yard, Marshalling yard and Locomotive yards - Level crossings. [2 Hrs]

4.2 STATION EQUIPMENTS

General - Engine shed - Ash pits - Examination pits - Drop pits -Water columns - Triangles - Turn table - Traversers - Scotch Block -Buffer stops -Fouling -marks Derailing switch - Sand hump -Weigh bridges. [2 Hrs]

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. [2 Hrs]

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. [2 Hrs]

4.5 INTERLOCKING

Definition - Principles of interlocking - Methods of interlocking - Tappets and locks system - Key system - Route relay system - -Improvements in interlocking and signalling. [2 Hrs]

4.6 RAPID TRANSPORT SYSTEM

General - Underground railways - Advantages - Tube railways - Its features. [2 Hrs]

UNIT V **[14 Hrs]**

BRIDGE ENGINEERING

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 - Alignment of bridge - Factors to be considered in alignment. [2 Hrs]

5.2 FOUNDATIONS

Functions of foundation - Types of foundations - Selection of foundations - Control of ground water for foundation - Caisson foundation - Coffer dam –Types. [2 Hrs]

5.3 CLASSIFICATION OF BRIDGES

Classification according to IRC loadings, Materials, Bridge floor, Type of superstructure - Culverts and Cause ways - Classifications with sketches - Conditions to construct causeways. [2 Hrs]

5.4 SUBSTRUCTURE

Abutments - Types - Piers - Types - Wing walls - Types. [2 Hrs]

5.5 SUPERSTRUCTURE

Types - Description - Simple bridge - Types according to bridge floor - Continuous bridge - Cantilever bridge - Balanced cantilever bridge - Arch bridge [2 Hrs]

Bow-string girder type bridge - Rigid frame bridge - Suspension bridge - Continuous steel bridges - Steel arched bridges. [2 Hrs]

5.6 BRIDGE BEARINGS

Definition - Purpose - Importance of bearings - Types of bearings – Elastomer bearings - Pot bearings. [2 Hrs]

Tests & Model Exam **[9 Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Principles of Transportation & Highway Engineering	R K Bansal	Tata McGraw Hill Publishing Company Ltd 2011
2.	Transportation Engineering	S.B.Junnarkar	S Chand & Company Ltd 2012

REFERENCE BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Highway Engineering	Rangwala	Charotor Publishing House Pvt. LtdEdition 2010
2.	Railway Engineering	Rangwala	Charotor Publishing House Pvt. LtdEdition 2010

LEARNING WEBSITES

1. https://nacto.org/wp-content/uploads/2012/06/ITE-2009.pdf
2. Lec-1.pdf (nptel.ac.in)
3. p (nptel.ac.in)
4. https://youtu.be/Z1RrZkFnApU

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Assignment	-5 marks
Tests	-10 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D430.1	2	2	3	3	3	3	3	3	3	3
D430.2	2	2	3	3	3	3	3	3	3	3
D430.3	2	2	3	3	3	3	3	3	3	3
D430.4	2	2	3	3	3	3	3	3	3	3
D430.5	2	2	3	3	3	3	3	3	3	3
D430 Total	10	10	15	15	15	15	15	15	15	15
Correlation level	2	2	3	3	3	3	3	3	3	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING:

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consider of 90% questions based on Lower Order Thinking (LOT'S) and the remaining 10% based on Higher Order Thinking (HOT'S) as detailed below

Bloom's taxonomy level	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED440 HYDRAULICS LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
HYDRAULICS 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.**

DETAILED ALLOCATION OF MARKS

SI. No	Description	Marks
1	Procedure	10
2	Tabulation and Observation	30
3	Calculations	25
4	Sketch / Graph	15
5	Accuracy of result	5
6	Mini Project	10
7	Viva-Voce	5
	Total	**100**

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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

LIST OF EQUIPMENTS

SI. No.	Name of Equipments required	Quantity required
1.	Bernoulli's theorem apparatus (closed circuit)	1 No.
2.	Venturimeter/Orifice meter 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	Pelt on wheel	1 No.

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
- Draw the characteristic curves for centrifugal and reciprocating pumps.

COURSE OUTCOMES:

Course	**CED440 HYDRAULICS LABORATORY**
After successful completion of this course, the students will be able to	
D440.1	Understand the flow of fluids properties,
D440.2	Analyze the calibrate flow measuring devices used in pipes
D440.3	Knowledge about co-efficient of discharges of Orifice, mouthpiece, orifice meter, Venturimeter, notches etc.,
D440.4	Understand the pipe friction factor
D440.5	Analyze the characteristic curves for centrifugal and Reciprocating pumps and develop the mini projects with report.

CED440 HYDRAULICS LABORATORY

Flow of Fluids:

1. Verification of Bernoulli's theorem.
2. Flow through Venturimeter – Determination of Co-efficient of Discharge.
3. Flow through Orificemeter – Determination of Co-efficient of Discharge.

Flow through orifice:

4. Determination of Co-efficient of Discharge by Time fall - Head method
5. Determination of Co-efficient of Discharge by Constant head method.

Flow through external cylindrical mouth piece:

6. Determination of Co-efficient of Discharge by Timing fall in head method
7. Determination of Co-efficient of Discharge by Constant head method

Flow through pipes:

8. Determination of friction factor for the given GI pipe / PVC pipe.

Flow through notch:

9. Determination of Co-efficient of Discharge for Rectangular Notch / V-Notch

Pumps:

10. Reciprocating pump – To draw characteristic curves and determine the efficiency
11. Centrifugal pump – To draw characteristic curves and determine the efficiency
12. Study of working principle of a Pelton wheel.
13. Mini Project

The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES

1. https://jecassam.ac.in/.../uploads/2018/10/lab-manual-of-hydraulics.
2. Welcome to Virtual Labs - A MHRD Govt of india Initiative (vlabs.ac.in)
3. Microsoft Word - lecture1 (nptel.ac.in)
4. https://youtu.be/zT_BkfXQnrc

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure/observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D440.1	3	2	3	2	3	2	3	3	2	3
D440.2	3	2	3	2	3	2	3	3	2	3
D440.3	3	2	3	2	3	2	3	3	2	3
D440.4	3	2	3	2	3	2	3	3	2	3
D440.5	3	2	3	2	3	2	3	3	2	3
D440 Total	15	10	15	10	15	10	15	15	10	15
Correlation level	3	2	3	2	3	2	3	3	2	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED440 HYDRAULICS LABORATORY

Model Question Paper

SI. NO	Answer the following questions and each questions carries 85 marks	CO	PO
1	Verify the Bernoulli's theorem by conducting an experiment using Bernoulli's apparatus. Draw the hydraulic gradient line and total energy line.	D440.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
2	Determine the co-efficient of discharge for the given venturimeter and draw a graph Head (H) Vs Actual discharge (Qa) (Take minimum five readings).	D440.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
3	Determine the co-efficient of discharges for the given orifice meter and draw a graph Head(H) Vs Actual discharge(Qa) (Take minimum five readings)	D440.3	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
4	Determine the co-efficient of discharge of orifice by Timing fall in head method. Draw a graph Time (t) Vs (–) (Take minimum five readings).	D440.3	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
5	Determine the co-efficient of discharge of orifice by constant head method and draw a graph Head (H) Vs Actual discharge (Qa) (Take minimum five readings).	D440.3	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
6	Determine the co-efficient of discharge of mouthpiece by Timing fall in head method. Draw a graph Time (t) Vs (–) (Take minimum five readings).	D440.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
7	Determine the co-efficient of discharge of mouthpiece by constant head method and draw a graph Head (H) Vs Actual discharge (Qa) (Take minimum five readings).	D440.3	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
8	Determine the friction factor for the given pipe and draw a graph Loss of head (hf) Vs square of the velocity (v2) (Take minimum five readings).	D440.4	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
9	Determine the co-efficient of discharge of rectangular notch and draw a graph Head (H) Vs Actual discharge (Qa) (Take minimum five readings).	D440.3	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
10	Determine the co-efficient of discharge of V notch and draw a graph Head (H) Vs Actual discharge (Qa)	D440.4	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7

	(Take minimum five readings).		
11	Determine the efficiency of the given Reciprocating pump by conducting performance test and draw characteristic curves.	D440.5	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
12	Determine the efficiency of the given Centrifugal pump by conducting performance test and draw characteristic curves.	D440.5	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
13	Min project	D440.5	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7

CED450 MATERIAL TESTING LABORATORY II

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examinations			
			Marks			Duration
	Hours / Week	Hours / Semester	Internal Assessment	Autonomous Examination	Total	
Material Testing Laboratory II	**3Hrs**	**48Hrs**	**25**	**100***	**100**	**3 Hours**

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

DETAILED ALLOCATION OF MARKS

SI.No	Description	Part - A Max. Marks (85)	Part - B Max. Marks (45)	Part - C Max. Marks (40)
1.	Procedure	10	5	5
2.	Tabulation and Observation	35	20	15
3.	Calculations	25	10	10
4.	Sketch / Graph	10	5	5
5.	Accuracy of result	5	5	5
6.	Mini Project	10		
7.	Viva Voce	5		
	TOTAL	**100**		

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

The understanding of the structure, 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 sand, clay, fine aggregates, course aggregates and water.

LIST OF EQUIPMENTS:

SI. No	Name 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 accessories	1 no.
7.	Dorry's abrasion testing machine with complete accessories	1 no.
8.	Aggregate impact testing machine with complete accessories	1 no.
9.	Crushing strength apparatus	1 no.
10.	Jackson Candle Turbidity Meter	1 no.
11.	Imhoff Cone	1 no.

OBJECTIVES:

On completion of the course, the student will be familiar with:

- Test on properties of fine aggregate and coarse aggregate.
- Test on properties of soil.
- Analysis the properties of water/waste water

COURSE OUTCOMES:

Course	**CED450 MATERIAL TESTING LABORATORY- II**
After successful completion of this course, the students will be able to	
D450.1	Analyze the basic testing properties of sand and aggregates
D450.2	Understand the different tests on coarse aggregate, cement
D450.3	Understand the properties of waste water
D450.4	Describe the standard soil properties and classify a soil.
D450.5	Understand the essential features and requirements of site investigation with soil under various loading condition and develop the mini projects with report.

CED450 MATERIAL TESTING LABORATORY II

PART A

1. Determination of Voids ratio and porosity of sand.
2. Determination of liquid limit and plastic limit of the given soil.
3. Determination of bulk density and specific gravity of Fine aggregates.
4. Determination of bulk density and specific gravity of Coarse aggregates.
5. Proctor‘s compaction Test on soil.
6. Direct shear test on sand.
7. Field Density of Soil by core cutter method / sand replacement method.

PART B

8. Attrition test on Aggregate.
9. Abrasion test on Aggregate.
10. Aggregate crushing value test.
11. Aggregate impact value test.
12. Determination of water absorption of coarse aggregate.

PART C

13. Determination of Total solids present in the given sample of water.
14. Determination of Turbidity of water by "Jackson candle turbidity meter."
15. Determination of settleable solids present in the given sample of water/ waste water by "Imhoff cone."
16. Determination of organic in organic matters present in the given sample of water.
17. Determination of the fineness of cement by Sieve analysis
18. Mini Project

The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES

1. https://nptel.ac.in
2. https://ndl.iitkgp.ac.in
3. https://lecturenotes.in/subject/156/material testing lab

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure/observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D450.1	3	2	3	3	2	2	2	2	3	3
D450.2	3	2	3	3	2	2	2	2	3	3
D450.3	3	2	3	3	2	2	2	2	3	3
D450.4	3	2	3	3	2	2	2	2	3	3
D450.5	3	2	3	3	2	2	2	2	3	3
D450Total	15	10	15	15	10	10	10	10	15	15
Correlation level	3	2	3	3	2	2	2	2	3	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED450 MATERIAL TESTING LABORATORY II

SI NO	Answer All the questions from (part A; questions carries 85 marks part B; questions carries 40 marks part C; questions carries 45 marks)	CO	PO
1.	A) Determine the 'Voids ratio' and 'Porosity' of the given sand sample. (Take minimum three readings)	D450.1	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
2.	B) Conduct an abrasion test on the given sample of stone specimen and determine the co-efficient of hardness value / Aggregate abrasion value.	D450.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
	C) Determine the "Total Solids" present in the given sample of water.	D450.3	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
3.	A) Determine the "Liquid limit" and "Plastic limit" of the given sample of soil.	D450.1	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
4.	B) Determine the "Impact value" of the given coarse aggregate sample and find the suitability of the aggregate for road construction.	D450.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
	C) Determine the "Settle able solids" present in the given sample of water or waste water by using "Imhoff cone apparatus".	D450.3	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
5.	A) Determine the "Bulk density" and "Specific gravity" of the given coarse aggregate sample. (Take minimum three readings)	D450.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
6.	B) Conduct the Crushing strength test on the given coarse aggregate sample and determine the aggregate crushing value.	D450.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
	C) Determine the "Turbidity" of the given water sample by using "Jackson Candle Turbidity meter".	D450.3	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
7.	A) Determine the "Bulk density" and "Specific gravity" of the given fine aggregate sample. (Take minimum three readings)	D450.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
8.	B) Conduct "Attrition Test" on the given coarse aggregate sample for a duration of 30 minutes and find the percentage of wear	D450.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7

	B) Determine the percentage of water absorption for the given coarse aggregate sample by conducting water absorption test.	D450.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
9.	A) Determine the "Field density" of natural soil at the given site by using sand pouring cylinder method or core cutter method.	D450.4	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
10.	A) Determine the "Optimum Moisture Content" (OMC) of the given soil sample by conducting Proctor's Compaction test. Assume water added to the soil sample as its moisture content. Take at least four readings and draw a graph "Percentage water content" Vs "Dry density".	D450.4	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
11.	A) Conduct a "Direct shear test" on the given fine aggregate sample and find the angle of friction of fine aggregate. Take at least four readings.	D450.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
	B) Determine of the fineness of cement by Sieve analysis	D450.2	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7
13.	Mini Project	D450.5	PO1,PO2,PO3,PO4 ,PO5,PO6, PO7

CED460 CONSTRUCTION PRACTICE LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examinations			
			Marks			Duration
	Hours / Week	Hours / Semester	Internal Assessment	Autonomous Examination	Total	
CONSTRUCTION PRACTICE LABORATORY	**4Hrs**	**64Hrs**	**25**	**100***	**100**	**3 Hours**

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

DETAILED ALLOCATION OF MARKS

SI.No	Description	Part – A Max. Marks (35)	Part – B Max. Marks (50)
1.	Procedure	5	5
2.	Tabulation and Observation	20	20
3.	Calculations	-	15
4.	Sketch / Graph	-	5
5.	Accuracy of result/ Report	10	5
6.	Mini Project	10	
7.	Viva Voce	5	
	Total	**100**	

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

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

Sl.No.	Name 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

OBJECTIVE:

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 and Vee - 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 OUTCOMES:

Course	**CED460 CONSTRUCTION PRACTICE LABORATORY**
After successful completion of this course, the students will be able to	
D460.1	Understand the layout for the building section
D460.2	Understand the concrete specification and strength, principles of mortars
D460.3	Understand the concrete cubes and to test for compressive strength and test for paints.
D460.4	Analyze the concrete strength and usages of termites
D460.5	Understand the bulking characteristics of the given sand for Non - Destructive test on hardened concrete, reinforcement details and develop the mini projects with report.

CED460 CONSTRUCTION PRACTICE LABORATORY

SI.NO **PART A**

1. Identify various sizes of available coarse aggregates from sample of 10 kg in laboratory and prepare report (60, 40, 20, 10 mm).
2. Identify the available construction materials in the laboratory on the basis of their sources.
3. 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)
4. 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.
5. Select first class, second class and third class bricks from the stake of bricks and prepare report on the basis of its properties.
6. 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.
7. Apply the relevant termite chemical on given damaged sample of timber
8. 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.
9. Prepare mortar using cement and Sand/ Fly ash or Granite/marble polishing waste in the proportion 1:6 or 1:3.

PART B

10. Prepare and develop a centre line plan, foundation Plan and set out spread footing in the field for the given line sketch of a building.
11. 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).
12. Arrangement of bricks using English bond for one brick thick wall and one and half brick thick wall for right angled corner junction.
13. Arrangement of bricks using English Bond for one brick thick wall, one and half brick thick wall for Tee junction.
14. Arrangement of bricks using English bond for one brick thick, one and half and two brick thick square pillars.
15. Straightening, cutting, hooking and bending and arrangement of steel reinforcement bars.
    a)singly reinforced beam b)lintel and sunshade c)column and footing
16. Mini Project

The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITE:

1. https://www.ilo.org/wcmsp5/groups/public/ed_emp/emppolicy/invest/documents/instructionalmaterial.pdf
2. http://www.vssut.ac.in/lecture_notes/lecture1424085991.pdf
3. https://nptel.ac.in/courses/105105108/5
4. http://en.wikibooks.org/wiki/

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure/observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D460.1	2	2	3	3	3	2	2	3	2	3
D460.2	2	2	3	3	3	2	2	3	2	3
D460.3	2	2	3	3	3	2	2	3	2	3
D460.4	2	2	3	3	3	2	2	3	2	3
D460.5	2	2	3	3	3	2	2	3	2	3
D460 Total	10	10	15	15	15	10	10	15	10	15
Correlation level	2	2	3	3	3	2	2	3	2	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED460 CONSTRUCTION PRACTICE LABORATORY

MODEL QUESTION PAPER

Time: 3 Hrs. **Max. Marks: 100**

S NO	Answer the following questions Part A; questions carries 35 marks Part B; questions carries 50 marks		CO	PO
1.	a.	Identify various sizes of available coarse aggregates from sample of 10 kg in laboratory and prepare report (60, 40, 20, 10 mm).	D460.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	b.	Prepare and develop a centre line plan, foundation Plan and set out spread footing in the field for the given line sketch of a building.	D460.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
2.	a.	Identify the available construction materials in the laboratory on the basis of their sources and prepare a report.	D460.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	b.	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).	D460.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
3.	a.	Identify the grain distribution pattern in given sample of teak wood in the laboratory and draw the various patterns and prepare a report. (along and perpendicular to the grains)	D460.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	b.	Arrangement of bricks using English bond for one brick thick wall and one and half brick thick wall for right angled corner junction.	D460.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
4.	a.	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.	D460.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	b.	Arrange the bricks using English Bond for one brick thick wall, one and half brick thick wall for Tee junction.	D460.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
5.	a.	Differentiate the first class, second class and third class bricks from the stake of bricks and prepare report on the basis of its properties.	D460.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	b.	Arrange bricks using English bond for one brick thick, one and half and two brick thick square pillars.	D460.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
6.	a.	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.	D460.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	b.	Arrange the reinforcement details for the beam for the given specifications.	D460.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

7.	a.	Apply the relevant termite chemical on given damaged sample of timber.	D460.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	b.	Arrange the reinforcement details for the lintel and sunshade for the given specifications.	D460.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
8.	a.	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.	D460.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	b.	Arrange the reinforcement details for the column and footing for the given specifications.	D460.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
9.	a.	Prepare mortar using cement and Sand/ Fly ash or Granite/marble polishing waste in the proportion 1:6 or 1:3.	D460.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	b.	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).	D460.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
10.	Mini Project		D460.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

CED470 SURVEYING PRACTICE II

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examinations			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
SURVEYING PRACTICE-II	4 Hrs.	64 Hrs.	25	100*	100	3 Hrs.

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

DETAILED ALLOCATION OF MARKS

SI.No	Description	Part – A/ B Max. Marks (35)	Part - C Max. Marks (30)
1.	Procedure	5	5
2.	Tabulation and Observation	10	10
3.	Calculations	10	5
4.	Sketch / Graph	5	5
5.	Accuracy of result	5	5
6.	Survey Camp	20	
7.	Mini Project	10	
8.	Viva Voce	5	
	Grand Total	100	

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

Equipments Required:

Sl. No	List of Equipments Required	Quantity Required
1.	Vernier Theodolite	6 nos
2.	Total Station	3 nos

OBJECTIVES:

At the end of the course, students will have experiences:

- In handling surveying equipments
- To do practical exercises in Theodolite surveying,
- To do Tachometric surveying
- To do surveying using Total station.

COURSE OUTCOMES

Course	**CED470 SURVEYING PRACTICE II**
After successful completion of this course ,the students will be able to	
D470.1	Use Theodolite for the measurement of horizontal and vertical angle Calculate the height of objects through a Trigonometrical leveling
D470.2	Use tachometric for the measurement of horizontal and vertical angle and calculate the elevation and gradient
D470.3	Understand the total station and measure the altitude , coordinates of various points and area of the field
D470.4	Understand the concept of photo grammetry in preliminary identification and map Making.
D470.5	Compute the knowledge of total station, remote sensing and GIS in different civil engineering applications and develop the mini projects with report.

CED470 SURVEYING PRACTICE II

SI.NO

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 baseline.
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
8. Run a closed theodolite traverse bar measuring length, included angles and bearing at initial station plot the traverse.

PART B: TACHEOMETRIC SURVEYING

9. Determination of constants of aTacheometer
10. Determination of distance and elevation of points by Stadia Tacheometry.
11. Determination of gradient between two points (with different elevations) by Stadia Tacheometry.
12. Determination of distance and elevation of points by Tangential Tacheometry.

PART C: TOTAL STATION

13. Study of Total Station General commands used – Instrument preparation and setting Reading distances and angles.
14. Measurement of distances and co-ordinates of given points, using Total station.
15. Measurement of altitude of given elevated points, using Total Station.
16. Run closed traverse using Total Station and plotting the traverse.
17. Determination of area of a field / land / College Campus etc. using Total station.
18. Selection and marking of Routings in Road path (way points) using GPS in our college campus
19. Mini Project

    The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

SURVEY CAMP: (Outside/inside the Campus)

Duration: 4 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 10 acres outside/inside 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. Three working days and one Saturday will be used for the camp work during the 14th week.

20 marks to be allotted for Survey file in the Autonomous 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.

LEARNING WEBSITES:

1. https://nptel.ac.in
2. https://ndl.iitkgp.ac.in
3. https://lecturenotes.in/subject/156/surveying-1-s-1

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure/observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D470.1	3	2	3	3	2	2	2	3	2	3
D470.2	3	2	3	3	2	2	2	3	2	3
D470.3	3	2	3	3	2	2	2	3	2	3
D470.4	3	2	3	3	2	2	2	3	2	3
D470.5	3	2	3	3	2	2	2	3	2	3
D470 Total	15	10	15	15	2	10	10	15	10	15
Correlation level	3	2	3	3	2	2	2	3	2	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED470 SURVEYING PRACTICE II

Model Question Paper

Time: 3 Hrs. **Max. Marks: 100**

S I NO	Answer the Following questions part A and part B; questions carries 35 marks part C; questions carries 30 marks		CO	PO
1.	A.	Determine the distance between the two given accessible points A & B from the station "O". Measure the horizontal angle by Repetition method (Take minimum three readings).	D470.1	PO1,PO2,PO3,PO4, PO5,PO6, PO7
	C.	Measure the distances and co ordinates of the given points (minimum 3 points) using "Total Station".	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7
2.	A.	Determine the distance between the two given inaccessible points P and Q, taking observations from the base line AB of length 6m. Measure the horizontal angles by Reiteration method.	D470.1	PO1,PO2,PO3,PO4, PO5,PO6,PO7
	C.	Determine the R.L of the given elevated points using "Total Station".	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7
3.	A.	Determine the height of an object and R.L of its top and bottom by base accessible method. The R.L of B.M is 100.000 m	D470.1	PO1,PO2,PO3,PO4, PO5,PO6,PO7
	C.	Determine the area enclosed between four points on the field using "Total Station".	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7
4.	A.	Determine the R.L of top of inaccessible elevated object by "Single plane method". The R.L of B.M is 150.000 m.	D470.1	PO1,PO2,PO3,PO4, PO5,PO6,PO7
	C.	Run a closed traverse using "Total Station" and plot the same.	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7
5.	A.	Determine the R.L of top of the given elevated inaccessible object by "Double Plane method". The R.L of B.M is 200.000m	D470.1	PO1,PO2,PO3,PO4, PO5,PO6,PO7
	C.	Measure the distances and co ordinates of the given points (minimum 3 points) Using "Total Station".	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7
6.	A	Run a closed Theodolite traverse (minimum of 5 station points) and check the sum of their included angles	D470.1	PO1,PO2,PO3,PO4, PO5,PO6,PO7
	C.	Determine the R.L of the given elevated points using "Total Station".	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7

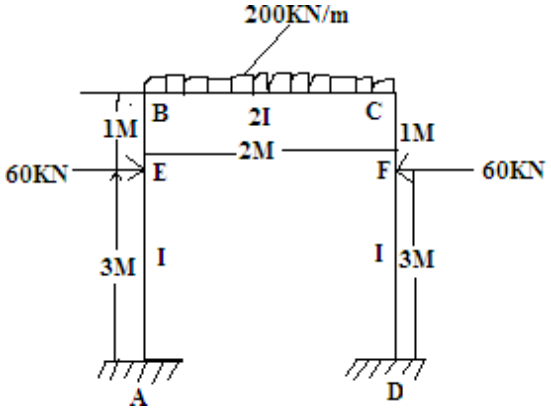
7.	B.	Determine the constants of the "Tacheometer" by taking tacheometric observations at 10m, 20m, 30m and 40m intervals	D470.2	PO1,PO2,PO3,PO4, PO5,PO6,PO7
	C.	Determine the area enclosed between four points on the field using "Total Station".	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7
8.	B.	Determine the R.L of bottom of staff stations (one elevated and other depressed) by stadia observations, taking R.L of B.M as 100.000 m (Assume Multiplying constant as 100 and Additive constant as zero)	D470.2	PO1,PO2,PO3,PO4, PO5,PO6,PO7
	C.	Run a closed traverse using "Total Station" and plot the same	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7
9.	B.	Determine the gradient between the given two staff stations A& B of different elevations. The R.L of B.M is 150.000m	D470.2	PO1,PO2,PO3,PO4, PO5,PO6,PO7
	C.	Measure the distances and co ordinates of the given points (minimum 3 points) using "Total Station".	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7
10.	B.	Determine the R.L of bottom of staff station by Tangential tachometry. The R.L of B.M is 200.000m.	D470.2	PO1,PO2,PO3,PO4, PO5,PO6,PO7
	C.	Determine the R.L of the given elevated points using "Total Station".	D470.3	PO1,PO2,PO3,PO4, PO5,PO6,PO7
11.			D470.5	PO1,PO2,PO3,PO4, PO5,PO6,PO7
12.	Mini Project		D470.5	PO1,PO2,PO3,PO4, PO5,PO6,PO7

CED410 THEORY OF STRUCTURES

MODEL QUESTION PAPER

PART- A					(Marks 10 × 3 = 30)
Note: Answer ALL questions. All questions carry equal marks.		**Unit**	**Blooms Level**	**CO**	**PO**
1.	Define prop. What are the types of prop?	I	R	D410.1	PO1,PO2,PO3
2.	Write short notes on statically determinate and statically indeterminate structures.	I	R	D410.1	PO1,PO2,PO3,
3.	Differentiate hogging and sagging moments.	II	U	D410.2	PO1,PO2
4.	What is the degree of indeterminacy of a fixed beam? Explain with a sketch.	II	R	D410.2	PO1,PO2
5.	Draw a neat sketch of deflected shape of portal frame under two different loading Conditions.	III	R	D410.3	PO1,PO2,PO3
6.	Draw SFD and BMD for a continuous beam with udl	III	R	D410.3	PO1,PO2,PO3,PO4,
7.	Write the equation for limit of eccentricity for a rectangular section.	IV	R	D410.4	PO3,PO4
8.	What are the assumptions made in Euler's theory?	IV	R	D410.4	PO1,PO2
9.	What are the applications of theorem of three moments?	V	R	D410.4	PO1,PO2
10.	Define earth pressure on retaining wall.	V	R	D410.5	PO1,PO3,PO4, PO5,

PART- B					(Marks 5 × 14= 70)
Note: i). Answer all Questions choosing either division (A) or division (B) of each question ii). All divisions carry equal marks.	**Marks**	**Unit**	**Blooms level**	**CO**	**PO**
11. (A) A propped cantilever AB of 8m span is propped at B. it is loaded with an udl of 10 kN/m over the Right half of the span. Determine prop reaction by area moment method. Draw SFD and BMD.	14	I	AP,AN	D410.1	PO1,PO2,PO3,PO4,PO5, PO6,PO7
(OR)					
(B) A fixed beam of 9 m span is subjected to an UDL of 20 kN/m over the entire length and two point loads of 15 kN each at 3 m from the ends.	14	I	AP,AN	D410.1	PO1,PO2,PO3,PO4,PO5, PO6,PO7

Calculate the fixed end moments. Draw the BMD indicating the maximum values.					
12. (A) A continuous beam ABC is fixed at A and C and simply supported at B. Each span AB and BC is 6 m. The span AB is loaded with an UDL of 10 kN/m and span BC is loaded with a point load of 60 kN at mid span. Using theorem of three moments find support moments reactions. Draw SFD and BMD.	14	II	AP,AN	D410.2	PO1,PO2,PO3,PO4,PO5, PO6,PO7
(OR)					
(B). A continuous beam ABC is fixed at A and C and simply supported at B. Each span AB and BC is 6 m. The span AB is loaded with an UDL of 10 kN/m and span BC is loaded with a point load of 60 kN at mid span. Using theorem of three moments find support moments reactions. Draw SFD and BMD.	14	II	AP,AN	D410.2	PO1,PO2,PO3,PO4,PO5, PO6,PO7
13. (A) A continuous beam ABC with end supports A and C as fixed, have span AB = 8 m = BC. The span AB carries an UDL of 60 kN/m throughout the span. The span BC carries a midpoint load of 100 kN Calculate the support moments by Moment Distribution Method. Draw SFD and BMD. Take EI = constant.	14	III	AP,AN	D410.3	PO1,PO2,PO3,PO4,PO5, PO6,PO7
(OR)					
(B) Analyze the portal frame shown in figure by moment distribution method. Draw the BMD. 	14	III	AP,AN	D410.3	PO1,PO2,PO3,PO4,PO5, PO6,PO7

14. (A) Compare the crippling loads given by Euler's and Rankine's formula for a tubular cast iron strut 3m long having outer and inner diameter 40mm and 30mm loaded through pin joints at the ends. Take E=2.1X10^5 N/mm^2, σc= 500 N/mm^2 and α = 1/1600.	14	IV	AP,AN	D410.4	PO1,PO2,PO3,PO4,PO5, PO6,PO7
(OR)					
(B) A rectangular column 250mm wide and 150mm thick carries a vertical load of 12kN at an eccentricity of 50mm in a plane bisecting the thickness. Determine the maximum and minimum intensities of stress in the section. Plot the variation of stress in column.	14	IV	AN	D410.4	PO1,PO2,PO3,PO4,PO5, PO6,PO7
15. (A) A rectangular masonry dam high 9m and 3.6m wide. It retains water up to a height of 8m. Calculate the maximum and minimum stress intensities at the base. Special weight of masonry is 20 kN/m^3 and that of water is 9.81 kN/m^3.	14	V	AP,AN	D410.5	PO1,PO2,PO3,PO4,PO5, PO6,PO7
(OR)					
(B) A retaining wall 6m high 1.2m wide at top and 3.6 m wide at base has a vertical face retaining earth at a surcharge of 15º with the horizontal. If the density of earth is 16 kN/m^3. Angle of repose is 30º; density of masonry is 23 kN/m^3. Calculate the magnitude of earth pressure	14	V	AP,AN	D410.5	PO1,PO2,PO3,PO4,PO5, PO6,PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as presented below:

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

CED420 HYDRAULICS

Model Question Paper

PART- A						**(Marks 10 × 3 = 30)**
Note: Answer ALL questions. All questions carry equal marks.		**UNIT**	**Blooms Level**	**CO**	**PO**	
1.	Define: Total pressure and Centre of pressure	I	R	D420.1	PO1,PO2	
2.	Mention units and dimensions for density and specific volume	I	R	D420.1	PO3,PO4,PO5	
3.	State Bernoulli's theorem.	II	R	D420.2	PO1,PO2	
4.	State the practical applications of orifice.	II	U	D420.2	PO1,PO2	
5.	Mention different types of Notches.	III	R	D420.3	PO1,PO2	
6.	What is a spill way and state its purpose in the dam?	III	R	D420.3	PO1,PO2,PO3	
7.	Define the terms : Wetted perimeter and Hydraulic mean depth	IV	R	D420.4	PO2,PO3PO4	
8.	List the advantages of lining of canals.	IV	R	D420.4	PO1,PO2,PO3PO4	
9.	Write a short note on Jet pump	V	R	D420.5	PO1,PO2,PO3PO4	
10.	State the specifications of a Centrifugal pump	V	U	D420.5	PO1,PO2,PO3PO4	
PART B						**(5 X 14 = 70)**
Note: Answer ALL questions by choosing either A (OR) B						
11. A	i) A capillary tube of diameter 2.7x10-3m is dipped in water. The surface tension at the contact surface is 73.5x10-3N/m. If the angle of contact is 25o, determine the capillary rise.	10	I	AP,AN	D420.1	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	ii) The pressure of water at a point in a pipe line is 5N/m2. 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	4	I	AP,AN	D420.1	PO1,PO2,PO3 PO4,PO5,PO6, PO7
OR						
B	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	I	AP,AN	D420.1	PO1,PO2,PO3 PO4,PO5,PO6, PO7
12. A	A) i)A horizontal pipe line of 100mm diameter discharges under a pressure of $343.4x10^3$Pa. The mean velocity is 1.2 m/s. Determine, a) pressure head b) velocity head and c) total head.	10	II	AP,AN	D420.2	PO1,PO2,PO3 PO4,PO5,PO6, PO7

	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. Find a. coefficient of discharge. coefficient of velocity and c. coefficient of contraction.	4	II	AP,AN	D420.2	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	OR					
B	B)Water flows through a 150mm diameter and 50m long pipe with a velocity of 3m/s. Find 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	II	AP,AN	D420.2	PO1,PO2,PO3 PO4,PO5,PO6, PO7
13. 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 C_d as 0.62.	14	III	AP,AN	D420.3	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	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 C_d as 0.60.	10	III	AP,AN	D420.3	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	ii) Determine the discharge over a sharp crested weir of length 20m under a constant head of 0.10m. Take C_d as 0.60.	4	III	AP,AN	D420.3	PO1,PO2,PO3 PO4,PO5,PO6, PO7
14. A	**i)**Calculate the hydraulic mean depth for a rectangular channel having a bottom width of2m, and depth of flow 1.75m.	10	IV	AP,AN	D420.4	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	ii) Design an economical rectangular channel to carry 90m^3/s with a bed fall of 1 in 1500. In the Chezy's formula, C=50.	4	IV	AP,AN	D420.4	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	OR					
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. Find the dimensions of the channel. Take C = 50	14	IV	AP,AN	D420.4	PO1,PO2,PO3 PO4,PO5,PO6, PO7
15. 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. Find C_d and %Slip	14	V	AP,AN	D420.5	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	OR					
B	i)What are the different types of heads for a centrifugal pump?	10	V	AP,AN	D420.5	PO1,PO2,PO3 PO4,PO5,PO6,

						PO7
	ii)A centrifugal pump, installed in a well for irrigation, pumps 2400litres 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	4	V	AP,AN	D420.5	PO1,PO2,PO3 PO4,PO5,PO6, PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as presented below:

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

CED430 TRANSPORTATION ENGINEERING

Model Question Paper

SI.NO	Note: Answer ALL questions. All questions carry equal marks.	Unit	Blooms Level	CO	PO
1.	What do you mean by Ribbon development? Suggest any two remedial measures.	I	R	D430.1	PO1,PO2
2.	What is 'Traffic Volume study' and Speed study'?	I	R	D430.1	PO1,PO2
3.	Explain the construction details of concrete Roads with neat sketch	II	U	D430.2	PO1,PO2,PO3
4.	Explain the Construction details with sketches of Water Bound Macadam Road.	II	U	D430.2	PO1,PO2,PO3 PO4
5.	What are the arrangements to be provided in Junction Stations?	III	R	D430.3	PO1,PO2
6.	Explain the different methods of plate laying	III	U	D430.3	PO1,PO2,PO3
7.	State the principles of Interlocking	IV	U	D430.4	PO1,PO2
8.	Write down the functions of Goods yard	IV	R	D430.4	PO1,PO2
9.	Write short notes on the types of wing walls.	V	R	D430.5	PO1,PO2,PO3
10.	Distinguish between causeway and bridge	V	U	D430.5	PO1,PO2,PO3 PO4

	PART B	**Marks (5X14= 80)**				
	Note: Answer ALL questions by choosing either A (OR) B					
11.	A. What is meant by Sight Distance? Explain various types with sketches.	14	I	R	D430.1	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	OR					
	B. Explain Standard Proctor Compaction test to determine Moisture- Density Relationship of soils	14	I	U	D430.1	PO1,PO2,PO3 PO4,PO5,PO6, PO7
12.	A. Explain various stages involved in a Highway Project.	14	II	U	D430.2	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	OR					
	B. Explain method of construction of Water Bound Macadam Road with sketch,	14	II	U	D430.2	PO1,PO2,PO3 PO4,PO5,PO6, PO7
13.	A. What is meant by Plate lying? Explain any two methods of plate laying.	14	III	R	D430.3	PO1,PO2,PO3 PO4,PO5,PO6, PO7
	OR					
	B. What is meant by Creep? List out its causes and effect.	14	III	R	D430.3	PO1,PO2,PO3 PO4,PO5,PO6,

						PO7
14.	A. What is meant by Turn out? Explain component parts of left hand turn out with Sketch.	14	IV	R	D430.4	PO1,PO2,PO3 PO4,PO5,PO6, PO7
OR						
	B. List out the methods used for the control of movements of trains. Explain any one Method.	14	IV	R,U	D430.4	PO1,PO2,PO3 PO4,PO5,PO6, PO7
15.	A. What are the points to be considered for site selection and alignment of bridges?	14	V	R	D430.5	PO1,PO2,PO3 PO4,PO5,PO6, PO7
OR						
	B. With neat sketches explains the Bowstring Girder Bridge and Rigid frame Steel bridge.	14	V	R,U	D430.5	PO1,PO2,PO3 PO4,PO5,PO6, PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as presented below:

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

DETAILLED SYLLABUS –V SEMESTER

CED510 STRUCTURAL ENGINEERING

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
STRUCTURAL ENGINEERING	**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	NO.OF HOURS
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	18
IV	Design of column by LSM Design of column footings	16
V	Steel Structures	18
	Tests and Model Exam	9
Total		**96**

COURSE DESCRIPTION:

This subject is an applied engineering subject. Diploma holders in Civil Engineering will be required to supervise RCC construction. He may also be required to design simple structural elements, make changes in design depending upon availability of materials (bars of different diameters). This subject thus deals with elementary design principles as per BIS code of practice BIS: 456 – 2000 by limit state method.

OBJECTIVES:

On completion of the course the students should be able to:

- Analyze and design simple RCC elements like singly / doubly reinforced rectangular beams, and singly reinforced T-beams (Cantilevers, Simply supported/ Continuous beams, Lintels etc.) for shear and flexure by limit state method;
- Design One way/ Two way slabs and Staircases by limit state method;
- Design Axially loaded Columns and Footings by limit state method;
- Design simple Steel members like laterally supported Beams, Tension members, Compression members and Welded connections by limit state method.

COURSE OUTCOMES:

Course	**CED510 STRUCTURAL ENGINEERING**
After successful completion of this course, the students should be able to	
D510.1	Design the RCC structures by limit state method and working stress method.
D510.2	Design T-beams, continuous beams by limit state method.
D510.3	Design one way slab and two way slab by limit state method.
D510.4	Design column and column footing by limit state method.
D510.5	Design of steel structures like steel beams and welded connection by limit state method.

CED510 STRUCTURAL ENGINEERING

UNIT - I **[18Hrs]**

REINFORCED CEMENT CONCRETE STRUCTURES

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 [2 Hrs]

Characteristic strength and grades of concrete – Behavior of R.C members in bending [2 Hrs]

Modular ratio and Equivalent area of R.C. Sections – Different types of loads on structures as per IS: 875-1987 - Different methods of design. [2 Hrs]

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 [2 Hrs]

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 [2 Hrs]

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. [2 Hrs]

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 [2 Hrs]

Development Length-Anchorage values of bends and hooks - Curtailment reinforcements- Design bending moments [2 Hrs]

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). [2 Hrs]

UNIT - II **[17Hrs]**

2.1 DESIGN OF T-BEAMS AND LINTELS FOR FLEXURE BY L.S.M

Cross sections of Tee and L-beams- Effective width of flange-Neutral Axis [2 Hrs]

and M.R of Singly Reinforced T-Sections

Design of singly reinforced T-beams for flexure–Problems on Simply supported T-beams [1 Hr]

T- beams carrying udl only Loads on Isolated Lintels over openings of masonry walls- [2 Hrs]

Design B.M for isolated lintels carrying rectangular/triangular loads- Design of Lintel- Simple problems [2 Hrs]

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:456-2000 [2 Hrs]

Design of rectangular continuous beams (Singly and Doubly Reinforced) using B.M. coefficients (equal spans & U.D.L only) for sagging and hogging moments. [2 Hrs]

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 [2 Hrs]

S.F Coefficients specified by IS:456- 2000– Nominal shear stress – Minimum shear reinforcement [2 Hrs]

Design of vertical stirrups for rectangular beams using limit state method –Simple problems- Practice on use of Design Aids (Description only). [2 Hrs]

UNIT - III **[18Hrs]**

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) [2 Hrs]

Strength and Stiffness requirements –Minimum and maximum permitted size, spacing and Area of main and secondary reinforcements as per IS 456 - 2000- Cover [2 Hrs]

Requirement to reinforcements in slabs- Design of cantilever/simply supported one way slabs and sunshades by limit state method [2 Hrs]

Design of continuous slabs using B.M coefficients- Check for shear and stiffness – [2 Hrs]

Curtailment of tension reinforcement –Anchoring of reinforcement– Practice in designing slabs using design aids (Description only). [2 Hrs]

Types of stairs according to structural behavior- Requirements of Stairs- Planning a staircase – Effective span of stairs – Effective breadth of flight slab- Distribution of loads on flights [2 Hrs]

Design of cantilever steps – Design of doglegged and Open well stairs spanning [2 Hrs]

parallel to the flight-planning of open well starcase

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 [2 Hrs]

Design B.Ms for Simply supported, Restrained and Continuous slabs – Tension and Torsion reinforcement requirement [1 Hr]

Design of two way slabs using B.M. coefficients – Curtailment of reinforcement – Check for stiffness only [1 Hr]

UNIT - IV **[16Hrs]**

4.1 DESIGN OF COLUMNS BY L.S.M

Limit state of collapse in compression – Assumptions - Limiting strength of short axially loaded compression members - Effective length of compression members – Slenderness limits for columns [2 Hrs]

Classification of columns -Minimum eccentricity for column loads – Longitudinal and Transverse reinforcement requirements as per I S 456-2000 [2 Hrs]

Cover requirement Design of axially loaded short columns with lateral ties / helical reinforcement – Practice on use of Design Aids (Description only). [2 Hrs]

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) [2 Hrs]

Critical sections for BM, Transverse/Punching Shears – Minimum reinforcement. [2 Hrs]

Distribution of reinforcement, Development length, Anchorage, Cover, Minimum edge thickness requirements as per IS 456-2000 [2 Hrs]

Design of Isolated footing (square and rectangular) with uniform/ varying thickness by limit state method- For Examination : Problem either on [2 Hrs]

(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. [2 Hrs]

UNIT - V **[18Hrs]**

STEEL STRUCTURES

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. [2 Hrs]

Net area and Net Effective sectional area of Tension members– Maximum permitted [2 Hrs]

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, channel sections Different forms of Compression members- Classification of Cross sections- Limiting Width to Thickness Ratio [2 Hrs]

Effective sectional area- End Conditions and Effective length of Compression members – Maximum permitted values of Slenderness ratio – Imperfection factor and Stress reduction factor [2 Hrs]

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) with or without cover plates. (Lacing and battens not included) [2 Hrs]

5.2 DESIGN OF SIMPLE BEAMS AND WELDED CONNECTION BY L.S.M [2 Hrs]

Classification of Steel beams –Effective span- Design principles- minimum thickness of web – deign strength of bending / shear-Limiting deflection of beams - Lateral buckling of beams – Maximum permitted Slenderness Ratio- Plastic Moment of Resistance and Plastic Section Modulus of Sections [2 Hrs]

Shape factor – Design of laterally supported simple beams using single / double rolled steel sections (symmetrical cross sections only)(Built-up beams not included) [2 Hrs]

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.(for theory only) [2 Hrs]

Tests & Model Exam **[9Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Limit State Design of Reinforced Concrete	B C Punmia	Lakshmi Publications 2007
2.	RCC Designs	B C Punmia	Lakshmi Publications 2006
3.	Design of RCC and Structural Elements	S S Bhavikatti	New Age International Publications-2011
4.	Limit state design in structural steel	M R.Shiyear	PHI Learning Pvt., Ltd 2011

REFERENCE BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Limit state Theory and Design of Reinforced Concrete	S.R.Karve and V.L.Shah	Vidhya Grisha Prakashan, Pune 2006
2.	Limit state Design of Reinforced Concrete	P C Varghese	PHI Learning Pvt.Ltd 2011
3.	Limit State Design of Concrete Structures	Dr.S.Ramachandra	Scientific Publisher 2004

CODE BOOK

SI.No	CODE BOOK	HAND BOOK
1.	IS 456-2000	SP24,
2.	IS 875-1987	Design 8 SP 16
3.	IS 800-2007	Detailing of reinforcement
4.	-	SP 34

LEARNING WEBSITES

1. https://youtube.videoken.com/embed/qhEton-EEOw
2. Design Of Reinforced Concrete Structures - Course (nptel.ac.in)
3. https://youtu.be/W6IrNmAQrQ8
4. https://youtu.be/Z9vfRAO0Wro

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Assignment	-5 marks
Tests	-10 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D510.1	3	3	3	3	2	3	3	3	3	3
D510.2	3	3	3	3	2	3	3	3	3	3
D510.3	3	3	3	3	2	3	3	3	3	3
D510.4	3	3	3	3	2	3	3	3	3	3
D510.5	3	3	3	3	2	3	3	3	3	3
D510 Total	15	15	15	15	10	15	15	15	15	15
Correlation level	3	3	3	3	2	3	3	3	3	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED520 ENVIRONMENTAL ENGINEERING

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
ENVIRONMENTAL ENGINEERING	**5 Hrs**	**80Hrs**	**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	NO.OF HOURS
I	Water Supply Engineering, Introduction, quantity of water, source of water, intakes and conveyance	14
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 project	14
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 or project	14
	Tests and Model Exam	9
TOTAL		**80**

COURSE DESCRIPTION:

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 supply scheme.
- To select suitable sources of water supply and pipe materials.
- To determine the quality of water, testing procedures and standards for drinking water.
- To understand the methods of purification of water.
- To understand the systems of distribution for a water supply scheme.
- To understand the basic facts of sanitary engineering, the methods of collection and conveyance of sewage.
- To understand the primary and secondary treatment of sewage and disposal.
- To know the methods of disposal of sludge and solid wastes.
- To identify the various pollution and their prevention.
- To create awareness about environmental impact assessment.

COURSE OUTCOMES:

Course	**CED520 ENVIRONMENTAL ENGINEERING**
After successful completion of this course, the students should be able to:	
D520.1	Understand the quantity, quality of water and its intakes.
D520.2	Understand the treatment of water purification.
D520.3	Understand the collection and distribution system.
D520.4	Learn the sanitation system and disposal of the sewage.
D520.5	Learn the primary treatments and solid waste disposal

CED520 ENVIRONMENTAL ENGINEERING

PART I - WATER SUPPLY ENGINEERING

UNIT I **[14 Hrs]**

1.1 INTRODUCTION

Water Supply – Salient Features of a Water Supply Scheme – [2 Hrs]

Flow Chart of a Water Supply Scheme- Agencies responsible for protected water supply. [1 Hr]

1.2 QUANTITY OF WATER

Water Supply - Need for Protected Water Supply - Objectives of Public Water Supply System Demand - [2 Hrs]

Types of Demand - Per Capita Demand - Prediction of Population - Problems in Arithmetical Increase Method, Geometrical Increase Method, IncrementalIncrease Method. [2 Hrs]

1.3 SOURCES OF WATER

Sources of Water – Surface Sources – Underground Water Sources –Selection of Source of Water [2 Hrs]

1.4 INTAKES AND CONVEYANCE

Intakes - Types of Intakes - Description of Intakes - [1 Hr]

Infiltration Galleries and Infiltration Wells in River Beds - Pipes for Conveyance of Water – Cast Iron, Steel, G.I., [2 Hrs]

Cement Concrete, R.C.C., Hume and PVC Pipes -Pipe Joints - Laying and Testing of Pipe Lines. [2 Hrs]

UNIT II **[15 Hrs]**

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. [2 Hrs]

2.2 PRIMARY TREATMENT OF WATER

Object of Water Treatment – Flow Diagram of a Treatment Plant – Function of Units – Sedimentation – Purpose of Sedimentation – [2 Hrs]

Types of Sedimentation Tank – Coagulation – Coagulants – Flocculation – Coagulation Process. [2 Hrs]

2.3 FILTRATION OF WATER

Theory of Filtration – Classification of Filters – Slow Sand Filter – Rapid Sand Filter [2 Hrs]

Pressure Filter - Comparison between slow sand filter and rapid sand filter. [2 Hrs]

2.4 DISINFECTION OF WATER AND WATER SOFTENING

Necessity of Disinfection – Methods of Disinfection – Chlorination –Action of Chlorine – Methods of Chlorine – [2 Hrs]

Forms of Chlorination –Water Softening – Necessity of Water Softening – Hardness – Types of Hardness – Effects of Hardness – Removal of Hardness (names only) - [2 Hrs]

Miscellaneous Water treatment (names only) – Mineral water – requirements – Treatment Process – Reverse of Osmosis (RO). [1 Hr]

UNIT III **[14 Hrs]**

3.1 DISTRIBUTION SYSTEM [2 Hrs]

Distribution System - Methods of Distribution Gravity System, Pumping System, Combined System - Systems of Water Supply - [2 Hrs]

Continuous and Intermittent Supply of Water - [1 Hr]

Layouts of Distribution - Dead End, Grid Iron, Radial and Circular Systems – Service Reservoirs - Types. [2 Hrs]

3.2 PREPARATION OF WATER SUPPLY SCHEME OR PROJECT [2 Hrs]

Reconnaissance of Survey – Demand of Water – Source of Water – Preparation of Topographical Map – [2 Hrs]

Layout Map of the Scheme – [1 Hr]

Map and Drawing to be Prepared – Office Work – Project Report. [2 Hrs]

PART II – SANITARY ENGINEERING

UNIT-IV **[14 Hrs]**

4.1 COLLECTION AND CONVEYANCE OF SEWAGE [2 Hrs]

Sanitation Purpose Terms - Systems of Sanitation - Quantity of Sewage - Variation in Rate of Flow of Sewage - [2 Hrs]

Estimation of storm water - problems - Minimum Size of Sewer – Shapes of Sewer (names only) [2 Hrs]

Materials used for Sewer - Joints in Sewer Line - Laying and Testing of Sewer Lines – Ventilation of Sewers - Cleaning of Sewers. [2 Hrs]

4.2 SEWER APPURTENANCES

Sewer Appurtenances Manhole - Lamp Hole - Catch Basin - Street - Inlet - Grease and Oil Trap - Flushing [2 Hrs]

Tanks Drainage Arrangements in Buildings - Sanitary Fittings - [2 Hrs]

Sewage Pumps Necessity - Types of Sewage Pumps (names only). [2 Hrs]

UNIT-V **[14 Hrs]**

5.1 PRIMARY TREATMENT OF SEWAGE

Introduction – Flow Diagram of Primary Treatment –Screens – Grit Chamber – Skimming Tank – Primary Sedimentation Tank. [2 Hrs]

5.2 SECONDARY TREATMENT OF SEWAGE

Introduction – Flow Diagram of Secondary Treatment – Function of the Units of Secondary Treatment - Secondary Sedimentation Tank – Filters – [2 Hrs]

Types - Trickling Filters - Activated Sludge Process – Septic Tanks for isolated buildings – Construction and working of septic tanks – Soak Pits – Dispersion Trenches. [2 Hrs]

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 - sources of noise pollution - effects of noise pollution - control of noise pollution - [2 Hrs]

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. [2 Hrs]

5.4 ENVIRONMENTAL IMPACT ASSESSMENT

Environmental impact assessment (EIA) - methodology of EIA - organising the job - performing the assessment - [2 Hrs]

Preparation of environmental impact statement (EIS) - review of EIS - environmental risk assessment - limitation of EIA. [2 Hrs]

Tests & Model Exam **[9 Hrs]**

TEXT BOOKS:

SI. NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Principles of Environmental science and engineering	P.Venugopala Rao	PHI Learning Pvt.Ltd New Delhi -2006
2.	Environmental Engineering	B C Punmia	Lakshmi Publications 2010
3.	Waste Water Engineering	B C Punmia	Lakshmi Publications 2010

REFERENCE BOOKS:

SI. NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Environmental Engineering	N.N. Basak	Tata McGraw Hill Publishing Company Ltd, New Delhi,2010
2.	Environmental Engineering	A.Kamala, D.L.Kanthrao	Tata McGraw Hill Publishing Company Ltd, New Delhi,2010
3.	Water supply and sanitary engineering Vol I & II	Gurcharan Singh	Standard Publisher & Distributors Delhi 2005

LEARNING WEBSITES

1. www.nptel.ac.in/courses/103/107/103107084
2. https://youtube.videoken.com/embed/5hKjurPjzwI
3. https://youtu.be/sMeUGwpvLtk

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Assignment	- 5 marks
Tests	- 10 marks
Seminar	- 5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D520.1	2	2	2	3	3	3	3	-	-	2
D520.2	2	2	2	3	3	3	3	-	-	2
D520.3	2	2	2	3	3	3	3	-	-	2
D520.4	2	2	2	3	3	3	3	-	-	2
D520.5	2	2	2	3	3	3	3	-	-	2
D520 Total	10	10	10	15	15	15	15	-	-	10
Correlation level	2	2	2	3	3	3	3	-	-	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED531 REMOTE SENSING AND GEOINFORMATICS

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
REMOTE SENSING AND GEOINFORMATICS	**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	NO.OF HOURS
I	Fundamentals of Remote Sensing	14
II	Photogrammetry	15
III	Image Interpretation and Analysis	14
IV	Fundamentals of GIS	14
V	GIS - Data entry, Storage and Analysis	14
	Tests & Model Exam	9
	TOTAL	**80**

COURSE DESCRIPTION:

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 photo grammetry concepts and fundamentals of Air photo interpretation
- Use various analysis and interpretation of GIS results

COURSE OUTCOMES:

Course	**CED531 REMOTE SENSING AND GEOINFORMATICS**
After successful completion of this course, the students should be able to	
D531.1	Understand the basic concepts of remote sensing.
D531.2	Learn the photogrammetry.
D531.3	Understand the image interpretation and analysis
D531.4	learn the Fundamentals of GIS
D531.5	Apply the Data Entry, Storage and Analysis

CED531 REMOTE SENSING AND GEOINFORMATICS

UNIT I **[15 Hrs]**

FUNDAMENTALS OF REMOTE SENSING

Basics of Remote Sensing: Definitions and its components – Energy Sources [2 Hrs]

and Radiation principles – electromagnetic radiation (EMR) – spectrum – [2 Hrs]

wavelength regions important to remote sensing – Atmospheric scattering, [2 Hrs]

absorption – Atmospheric windows – spectral signature concepts – typical [2 Hrs]

spectral reflective characteristics of water, vegetation and soil. characteristic of [2 Hrs]

real remote sensing system, platforms, orbit types, sensors, resolution concept [2 Hrs]

satellite,-Pay load [1 Hr]

description of important Indian Earth Resources and Meteorological satellites. [2 Hrs]

UNIT II **[15 Hrs]**

PHOTOGRAMMETRY

Geometric elements [3 Hrs]

a vertical photograph [3 Hrs]

Stereoscopic plotting instruments, [3 Hrs]

Ortho photos, [3 Hrs]

Flight planning [3 Hrs]

UNIT III **15 Hrs.**

IMAGE INTERPRETATION AND ANALYSIS

Fundamentals of Air-photo interpretation – [3 Hrs]

Elements of image- interpretation, [2 Hrs]

concepts of digital image processing [2 Hrs]

image Rectification [2 Hrs]

Restoration Image enhancement, [2 Hrs]

Image classification [2 Hrs]

Application of Remote sensing in Civil Engineering [2 Hrs]

UNIT IV **[14 Hrs]**

FUNDAMENTALS OF GIS

Basic Concepts of GIS – [2 Hrs]

Basic spatial concepts –Coordinate Systems: [2 Hrs]

Definitions - History of development of GIS [2 Hrs]

Components of GIS: Hardware, [2 Hrs]

Software, Data, People and Methods – Proprietary and open source Software [2 Hrs]

Types of data – Spatial, Attribute data- [2 Hrs]

Types of attributes – scales/ levels of measurements-Data Base Management Systems (DBMS). [2 Hrs]

UNIT V **[14 Hrs]**

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 [2 Hrs]

integrated data analysis- mapping concept – [2 Hrs]

development of map overlay, overlay operation [2 Hrs]

Errors and quality control. Land Information System (LIS)– Various GIS applications in Civil Engineering- [2 Hrs]

Regional Planning and Site investigations, Hydrology and Water Resources Engineering, [2 Hrs]

Transportation network analysis- [2 Hrs]

Highway Alignments. [2 Hrs]

Tests & Model Exam **[9 Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER&EDITION
1.	Remote Sensing and Geographical Information systems.	Lo &Yeung	Geographic Information Systems, Prentice of India,1998
2.	Lillesand, T.M. & Kiefer R.W.	Lillesand, T.M. & Kiefer R.W.	Remote Sensing and image interpretation,2005
3.	Principle of Geographical Information Systems for land resources assessment	Burrough P.A.	Clarendon Press, Oxford. 2000

REFERENCE BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER&EDITION
1.	Geographic Information Systems & Environmental Modeling	Clarke Parks & Crane	Prentice-Hall of India, 2005
2.	Elements of Photogrammetric	Wolf Paul	New Age International Publications, Chennai, 1998
3.	GIS Basics	Shahab Fazal	New Age International Publications Chennai 2007

LEARNING WEBSITES

1. https://onlinecourses.nptel.ac.in/noc21_ce11/preview
2. https://youtube.videoken.com/embed/eABubdXSYO8
3. https://youtu.be/1ND59chGkHU
4. https://www.sle.kit.edu/.../master-remote-sensing-geoinformatics.php

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Assignment	- 5 marks
Tests	- 10 marks
Seminar	- 5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D531.1	3	3	3	3	3	3	3	3	2	2
D531.2	3	3	3	3	3	3	3	3	2	2
D531.3	3	3	3	3	3	3	3	3	2	2
D531.4	3	3	3	3	3	3	3	3	2	2
D531.5	3	3	3	3	3	3	3	3	2	2
D531 Total	15	15	15	15	15	15	15	15	10	10
Correlation level	3	3	3	3	3	3	3	3	2	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED532 CONCRETE TECHNOLOGY

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
	Hours / Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
CONCRETE TECHNOLOGY	**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	NO.OF HOURS
I	Concrete: Introduction, Cement, Aggregates and water	15
II	Admixtures , Mix Design for Concrete	14
III	Special Concrete, Pre-stressed Concrete	14
IV	Light Weight Concrete, Formwork	14
V	Cracks in Concrete Structure and their Prevention, Joints, Repairs and Maintenance of Concrete	14
	Tests & Model Exam	9
	Total	**80**

COURSE DESCRIPTION:

Diploma students in Civil Engineering require 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 cracks in 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 OUTCOMES:

Course	**CED532 CONCRETE TECHNOLOGY**
After successful completion of this course, the students should be able to	
D532.1	Understand the principles of concrete materials
D532.2	Design the admixture and mix concrete
D532.3	Design of Special concrete
D532.4	Design of Pre-stressed concrete
D532.5	Design of Concrete Structure and their Preventive action

CED532 CONCRETE TECHNOLOGY

UNIT I **[15Hrs]**

1.1 CONCRETE

Introduction of Concrete Technology and Concrete – Ingredients of Concrete. [2 Hrs]

Cement: Composition of Cement – Function of Cement Ingredients – Types of Cements (Names Only) – Uses of Cement. [2 Hrs]

Aggregates: Fine Aggregate – Sand – Types of Sand based on the purpose of use – [2 Hrs]

Types of sand based on the Grain size – Properties of good Sand. [2 Hrs]

Coarse Aggregates – Functions – Properties – Requirements – Classification of Aggregates. [2 Hrs]

Water – Functions – Water for Curing of Concrete. [1 Hr]

Properties of Concrete – Production of Concrete – [2 Hrs]

Types of Concrete and its uses – Test on Concrete (Names only). [2 Hrs]

UNIT II **[14 Hrs]**

2.1 ADMIXTURES

Definition – Functions of Admixtures – Classification of Admixtures: Accelerating admixtures – Retarding admixtures [3 Hrs]

Grouting admixtures – Air entraining admixtures Pozzolanic or mineral admixtures – Air detraining admixtures – Plasticizers – Super plasticizers. [3 Hrs]

2.2 MIX DESIGN FOR CONCRETE

Mix design – purpose of Mix design – object of Mix design- [2 Hrs]

Factors Influencing the choice of Mix design – variables in proportioning – [2 Hrs]

Mix design methods – Mix design procedure I.S. Code method – [2 Hrs]

Mix proportions for weigh batching and volume batching. [2 Hrs]

UNIT III **[14 Hrs]**

3.1 SPECIAL CONCRETE

Polymer concrete – Fiber reinforced concrete- [3 Hrs]

Light weight concrete – Shotcrete or guniting concrete(Applications and Advantages) [3 Hrs]

3.2 LIGHT WEIGHT CONCRETE

Classification of light weight concrete [2 Hrs]

– Characteristics of light weight concrete [2 Hrs]

– Applications of light concrete – [2 Hrs]

Advantages of light weight concrete. [2 Hrs]

UNIT IV **[14 Hrs]**

4.1 PRE-STRESSED CONCRETE

General principle of stressing – advantages of pre stressed –Concrete –Need for High strength steel and concrete- terminology [2 Hrs]

tendon – anchorage – pre tensioning-post tensioning – bonded pre stressed concrete – non bonded pre stressed concrete – [2 Hrs]

methods of pre stressing – pretension method – post tension method – [2 Hrs]

system of pre stressing – freyssinet system – Magnet blaton system – Lee-mc - call system – application of pre stressing elements – [2 Hrs]

Causes for losses in pre stress and remedial measures. [2 Hrs]

4.2 FORMWORK

Requirements of formwork – materials used for formwork –cleaning and [2 Hrs]

treatments of forms –

Points to be kept in mind before placing concrete in form work. [2 Hrs]

UNIT V **[14 Hrs]**

5.1 CRACKS IN CONCRETE STRUCTURE AND THEIR PREVENTION

Cracks in concrete structures [2 Hrs]

Assessment of cracks – types of cracking – preventive measures. [3 Hrs]

5.2 JOINTS, REPAIRS AND MAINTENANCE OF CONCRETE

Types of joints – [2 Hrs]

construction joints – contraction joints – expansion joints – [3 Hrs]

isolation joints – [2 Hrs]

methods of repairing concrete works [2 Hrs]

Tests & Model Exam **[9 Hrs]**

TEXT BOOKS:

SI. NO	TITLE	AUTHOR	PUBLISHER&EDITION
1.	Limit State Design in Structural Steel	M.R.Shiyekar	PHI Learning Pvt ltd,2011
2.	Sustainable construction: Green Building design and Delivery	Kibert, C.J., John Wiley Hobouken	NewJersey.
3.	Energy Technology	O.P. Gupta	Khanna Publishing House, NewDelhi

REFERENCE BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER&EDITION
1.	Energy Management and Conservation	Sharma K Venkataseshaia	IK International.
2.	Green Building - Project Planning and Cost Estimating	Means R S	John Wiley &Sons
3.	Non-conventional Energy Resources	S K.,	New Age International Publishers, NewDelhi.

LEARNING WEBSITES

1. https://www.nptel.ac.in/courses/105/102/105102012
2. https://youtube.videoken.com/embed/9PSuiuGic3w
3. https://youtube.videoken.com/embed/APYtuALgjoQ
4. https://theconstructor.org/concrete

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Assignment	- 5 marks
Tests	- 10 marks
Seminar	- 5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D532.1	3	3	3	2	-	-	2	3	2	3
D532.2	3	3	3	2	-	-	2	3	2	3
D532.3	3	3	3	2	-	-	2	3	2	3
D532.4	3	3	3	2	-	-	2	3	2	3
D532.5	3	3	3	2	-	-	2	3	2	3
D532 Total	15	15	15	10	-	-	10	15	10	15
Correlation level	3	3	3	2	-	-	2	3	2	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED533 GEOTECHNICAL ENGINEERING

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
GEOTECHNICAL ENGINEERING	**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	NO.OF HOURS
I	Index properties and Hydraulic Properties of Soil	14
II	Classification and Strength of Soil, Stabilization of Soil and Sub-soil Sampling	14
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
	Tests & Model Exam	9
	TOTAL	**80**

COURSE DESCRIPTION:

Civil Engineering diploma engineers are required to supervise the construction of roads and pavements, dams, embankments, and other Civil Engineering structures. As such, the knowledge 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 in the 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 OUTCOMES:

Course	**CED533 GEOTECHNICAL ENGINEERING**
After successful completion of this course, the students should be able to	
D533.1	Understand the Soil Mechanics & Properties.
D533.2	Learn the classification of soils and stabilization of soil.
D533.3	Understand the seepage analysis and structures, bearing capacity of foundations
D533.4	Learn about expansive soil
D533.5	Understand the foundations of transmission line towers

CED533 GEOTECHNICAL ENGINEERING

UNIT I **[14 Hrs]**

GEOTECHNICAL ENGINEERING:

1.1 SOIL MECHANICS AND INDEX PROPERTIES:

Introduction - Development of Soil Mechanics – Fields of application of Soil Mechanics - Soil formation [2 Hrs]

Cohesive and Cohesion less soil - Soil Properties – Three phase system - General, Index and Engineering properties [2 Hrs]

- Detailed description – Atter Berg's limits - Simple problems – Soil map of India. [2 Hrs]

1.2 HYDRAULIC PROPERTIES OF SOIL:

Introduction - Permeability – Co-efficient of permeability – [2 Hrs]

Darcy's law - Factors affecting permeability [2 Hrs]

- Permeability tests - Simple problems [2 Hrs]

- Quick sand conditions. [2 Hrs]

UNIT II **[14 Hrs]**

CLASSIFICATION AND STRENGTH OF SOIL, STABILIZATION OF SOIL AND SUB-SOIL SAMPLING

2.1 CLASSIFICATION AND STRENGTH OF SOIL :

Classification of soil - Introduction - Necessity – Systems of soil classification - Field identification of soil [2 Hrs]

Shear strength of soil - Introduction - Shear strength - Mohr's stress circle – Mohr- Coulomb failure theory - Shear strength test - Unconfined compression test - [2 Hrs]

Mohr's circle for unconfined compression test - Compaction - Consolidation - Consolidometer - Optimum moisture content – [2 Hrs]

Proctor's Compaction test - Methods of compaction - Degree of compaction - Field density of soil - Tests - Compaction and Consolidation - Comparison. [2 Hrs]

2.2 STABILIZATION OF SOIL AND SUB-SOIL SAMPLING :

Stabilization of soil - Introduction - Objects of stabilization - Methods of stabilization - Soil exploration - [1 Hr]

Introduction –Objects of soil exploration - Methods of soil exploration - Direct , Semi-direct and Indirect methods - Spacing and depth of test borings - Boring log - [2 Hrs]

Sounding and Penetration tests-Standard Penetration Test(SPT)- Geophysical methods - Sub-soil Sampling - Disturbed and Undisturbed samples - [2 Hrs]

Types of samplers - Split spoon sampler - Thin-walled sampler - Chunk sampling. [1 Hr]

UNIT III

SEEPAGE ANALYSIS AND SEEPAGE BELOW HYDRAULIC STRUCTURES, BEARING CAPACITY AND SETTLEMENT OF FOUNDATIONS **[15 Hrs]**

3.1 SEEPAGE ANALYSIS AND SEEPAGE BELOW HYDRAULIC STRUCTURES :

Seepage analysis - Introduction - Head , Gradient and Potential - Hydraulic gradient - Seepage pressure – [2 Hrs]

Upward flow (Quick condition or Quick sand) - Types of flow lines - Types of flow (Definition only) – [2 Hrs]

Two dimensional flow (Laplace equation) - Velocity potential -Properties of flow net - Uses of flow net - Seepage below Hydraulic structures – [2 Hrs]

Introduction - Hydraulic gradient - Piping - Exit gradient - Khosla's theory - Seepage flow nets below hydraulic structures. [2 Hrs]

3.2 BEARING CAPACITY AND SETTLEMENT OF FOUNDATIONS :

Bearing capacity - Introduction - Terminology - Factors affecting bearing capacity of soils – [2 Hrs]

Methods of determining bearing capacity - Types of failure in soil - General , Local and Punching shear failure – [1 Hr]

Analytical methods - Rankine's analysis - Terzaghi's analysis - Assumption and limitations - Effect of water table - Methods of improving bearing capacity of soil – [2 Hrs]

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. [2 Hrs]

UNIT IV **[14 Hrs]**

FOUNDATIONS AND FOUNDATIONS IN EXPANSIVE SOIL

4. 1 FOUNDATIONS :

Introduction - Definitions - Objectives - Requirements of foundation - Criteria for selection of type of foundation - Types of foundations – [2 Hrs]

Shallow foundation types-isolated, combined ,raft Deep foundations - Types - Foundation at different levels – [2 Hrs]

Foundation on made up grounds - Deep foundation - Introduction - Pile foundation - Uses of piles - Types of piles - Caisson foundation – [2 Hrs]

Types - Selection of piles - Pile Driving - Capacity of piles - Pile load test - Floating foundation - Negative skin friction – [2 Hrs]

Pile groups - Bearing capacity of pile groups - BIS provision for Settlement of pile group – Design of foundation using software (Description only) [2 Hrs]

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- [2 Hrs]

Traditional Indian practice - Methods of foundation in expansive soils – Replacement of soils and "CNS" concept - Under reamed pile foundation - Remedial measures for cracked buildings. [2 Hrs]

UNIT V **[14 Hrs]**

MACHINE FOUNDATION AND TOWER FOUNDATIONS (TRANSMISSION LINE)

5.1 MACHINE FOUNDATION :

Introduction - Soil dynamics - Free vibration and Forced vibration - Definitions - [2 Hrs]

Natural frequency - Barkan's method Pauw's method – [2 Hrs]

Types of machines and machine foundation - General requirements - Design of machine foundations – [2 Hrs]

Reciprocating type - Centrifugal type - Impact type - design steps- Couzen theory -

In-situ dynamic investigation of soil - Methods - IS code of practice - Design criteria [2 Hrs]

Isolation of foundation - Simple problems. [2 Hrs]

5.2 FOUNDATIONS OF TRANSMISSION LINE TOWERS

Introduction - Necessity - Forces on Tower Foundations – [2 Hrs]

General design criteria – Choice and type of foundations - Design procedures - Stability conditions – Description only [2 Hrs]

Tests & Model Exam **[9 Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Soil Mechanics and Foundation Engineering	B C Punmia	Laxmi publications (P)Ltd.,2005
2.	Analysis and Design of Substructures	Swami Saran & V N S Murthy	Second E**d**ition 2010

REFERENCE BOOKS

SI.NO	TITLE	AUTHOR	PUBLISHER&EDITION
1.	Soil Mechanics &	VNS Murthy	Sai Kripa Technical
2.	Foundation Engineering		Consultants 2007
3.	A Text Book of Soil	Dr S B Sehgal	CBS Publishers &

LEARNING WEBSITES

1. https://nptel.ac.in/courses/105/101/105101201
2. https://youtu.be/Lng0hVDvsu0
3. https://nptel.ac.in/content/storage2/courses/105103025/module2/lec10/1.html
4. https://youtu.be/pEp3j7TXAeA

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Assignment	- 5 marks
Tests	- 10 marks
Seminar	- 5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D533.1	3	3	3	2	3	3	2	3	2	3
D533.2	3	3	3	2	3	3	2	3	2	3
D533.3	3	3	3	2	3	3	2	3	2	3
D533.4	3	3	3	2	3	3	2	3	2	3
D533.5	3	3	3	2	3	3	2	3	2	3
D533 Total	15	15	15	10	15	15	10	15	10	15
Correlation level	3	3	3	2	3	3	2	3	2	3

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED540 CIVIL ENGINEERING DRAWING AND CAD PRACTICAL - II

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examinations			
			Marks			Duration
	Hours / Week	Hours / Semester	Internal Assessment	Autonomous Examinations	Total	
CIVIL ENGINEERING DRAWING AND CAD PRACTICAL - II	**6 Hrs**	**96 Hrs**	**25**	**100***	**100**	**3 Hrs**

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

DETAILED ALLOCATION OF MARKS

SI.NO	Description	Marks
PART I&II	Manual Drawing (Plan)	20 marks
	Section / Elevation	20 marks
PART III Using CAD	Plan/Elevation	25 marks
	Plan / Cross section / longitudinal section	20 marks
	Mini Project	10 marks
	Viva – voce	5 marks
	Total	**100 marks**

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

EQUIPMENTS REQUIRED

SI.No	Name of the Equipments	Quantity Required
1.	Drawing Table with Board	30 Nos.
2.	Computers	30 Nos.
3.	Laser printer	3 Nos.
4.	CAD software	30 Users

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

COURSE OUTCOMES:

Course	**CED540 CIVIL ENGINEERING DRAWING AND CAD PRACTICAL - II**
After successful completion of this course, the students will be able to	
D540.1	Understand the select the appropriate Structural system for a conventional reinforced concrete Structure.
D540.2	Determine the preliminary designs of structures assuming preliminary dimensions.
D540.3	Learn the fundaments of reinforced concrete to design structures like retaining walls, water tanks, staircase, and other structures of importance.
D540.4	Describe the plan, section & elevation R.C.C slab culvert with splayed wing walls
D540.5	Analyze the plan, cross section and longitudinal section with the bar bending schedule and develop the mini projects with report.

CED540 CIVIL ENGINEERING DRAWING AND CAD PRACTICAL - II

Preparation of Drawings manually (part I and II) and Using Cad Software part III

I PUBLIC HEALTH ENGINEERING

Draw plan and sectional views of the following

1. Rapid Sand Filter
2. Septic Tank with dispersion Trench / Soak pit
3. R.C.C square overhead tank supported by four columns

II BRIDGE DRAWING

Draw plan and sectional views of the following

4. Steel Foot over bridge across a highway
5. Two span Tee Beam Bridge with square returns

III STRUCTURAL DRAWING

Draw plan and cross section and longitudinal section using cad

6. Continuous one-way slab (with three equal spans)
7. Simply supported two-way slab
8. Restrained two-way slab
9. Singly reinforced rectangular beam
10. Doubly reinforced Continuous beam (Rectangular beam with two spans)
11. Tee Beams supporting continuous slab
12. Lintel and Sunshade
13. Dog-legged staircase
14. R.C.C. Column with square isolated footings
15. Mini Project

The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES

1. https://nptel.ac.in/courses/105/104/105104148
2. https://youtube.videoken.com/embed/qhEton-EEOw
3. https://youtu.be/Qr-qcT2P4AA

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure/observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks
Total	**- 25 marks**

CO-SPOs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D540.1	2	2	3	3	3	3	3	2	2	3
D540.2	2	2	3	3	3	3	3	2	2	3
D540.3	2	2	3	3	3	3	3	2	2	3
D540 .4	2	2	3	3	3	3	3	2	2	3
D540 .5	2	2	3	3	3	3	3	2	2	3
D540 Total	10	10	15	15	15	15	15	10	10	15
Correlation level	2	2	3	3	3	3	3	2	2	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED540 CIVIL ENGINEERING DRAWING AND CAD PRACTICAL - II

Model Question Paper

Time: 3 Hrs. **Max. Marks: 100**

S NO	Answer the following the questions part I and part II; questions carries 40 marks, part III; questions carries 45 marks		CO	PO
1.	I	Draw the Plan, and Longitudinal section of a **Rapid sand filter** for the given Detailed specifications : Size of filter unit: 8000 mm x 6000 mm Size of inlet chamber: 1000 mm x 6000 mm Wall thickness at top and bottom: 400 mm and 600mm Thickness of foundation: 400 mm Diameter of main drain: 400 mm Laterals: 80mm dia with 10mm strainers at 250mm c/c Slope of laterals: 1 in 50 Raw water inlet pipe : 300 mm dia Wash water drain pipe: 300 mm dia Size of wash water trough: 250 mm x 350mm Number of wash water trough: 3 Free board: 300mm Air laterals: 50 mm dia @ 500 mm c/c Depth of filter media: 750 mm Depth of base material: 600 mm	D540.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	III	Draw Plan showing (a) Top reinforcement (b) Bottom reinforcement and Longitudinal Section using CAD of **Continuous one–way slab with three equal spans** for the given Detailed specifications. Size of floor slab : 9m x 7m T-beams c/c distance : 3m Width of wall support : 250mm Thickness of slab : 150mm Clear cover : 25mm **Main reinforcement :** Middle of end span : 10mm dia @ 200mm c/ c Middle of interior span : 10mm dia @ 300mm c/c Support next to end support : 10mm dia @ 250mm c/c Distributors: 8mm dia @ 300mm c/c Use standard anchorage and curtailment practices wherever necessary.	D540.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7

2.	**I**	Draw the Plan and Longitudinal section a **Septic tank** with dispersion trench for The given detailed specifications. **Septic tank :** Size : 3400mm x 1600 mm Depth : 2000mm Free board : 450 mm Manhole : 600mm x 600mm Walls of brick masonry : 450mm Slope in base concrete : 1 in 20 Base Concrete thickness at left side edge : 200mm Baffle wall thickness : 100mm Depth of baffle wall from brick liquid : 100mm Distribution chamber : 600mm x 600mm Distance of baffle wall from brick wall : 800mm Thickness of foundation concrete : 300 mm Foundation concrete offset : 100 mm : **Stone ware pipes diameter:** Inlet pipe : 150mm Tee pipe at outlet : 150mm Outlet pipe from outlet chamber to dispersion trench : 100mm Vent pipe : 50mm **Dispersion trench :** Length : 10000mm Width of the dispersion trench : 1000 mm Depth of trench below G.L : 1400 mm Turfing depth above ground level : 300 mm	D540.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	III	Draw Plan showing (a) Top reinforcement (b) Bottom reinforcement and Cross section of the slab along Shorter span and Longer span of a **Restrained Simply supported two–way slab** for the given detailed specifications. Size of room : 3 m x 5m Width of supporting walls : 230mm Clear cover : 15mm Thickness of slab : 165mm **Middle strip reinforcement** Shorter span (Main reinforcement) : 8mm dia Fe415 @ 165mm c/cLonger span (Main reinforcement) : 8mm dia Fe415 @ 260mm c/c **Edge strip reinforcement**	D540.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

		Both direction : 8mm dia Fe415 @ 260mm c/c **Torsion reinforcement** Provide 4 layers (2 layers at bottom and 2 layers at top) 4 nos. of 8mm dia Fe415 bars. Use standard anchorage and curtailment practices wherever necessary.		
3.	**I**	Draw the Plan and Longitudinal section of a ‘’**Septic tank with Soak pit”** for the given detailed specifications. **Septic tank:** Size : 4000mm X 1400 mm Depth : 2000mm Free board : 400mm Manhole : 600mm x 600mm Walls of brick masonry : 450mm Slope in base concrete : 1 in 20 Depth of foundation concrete : 200 mm Foundation concrete offset : 100 mm Base concrete thickness at left side edge : 200mm Baffle wall thickness : 100mm Depth of baffle wall from liquid surface : 100mm Distribution chamber : 600mm x 600mm Distance of baffle wall from brick wall : 800mm RCC cover slab : 100mm thick **Stone ware pipes diameter:** Inlet pipe : 100mm Tee pipe at outlet : 100mm Outlet pipe from outlet chamber to soak pit : 100mm Vent pipe : 50mm **Soak pit :** Diameter : 2000mm Depth : 2500 mm Dry brick wall : 200mm Brick aggregate wall size : 150mm Sand thickness : 150mm Free board : 500mm	D540.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	III	Draw Plan showing (a) Top reinforcement (b) Bottom reinforcement and Longitudinal and Cross Section for a **Singly reinforced rectangular beam** using CAD for the given detailed specifications. Clear span : 6m Width of wall : 300mm	D540.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7

		Clear cover : 25mm Size of beam : 300mm x 500mm **Reinforcement details:** Tension reinforcement : 5 nos. of 20mm dia Hanger bar : 2nos. of 12mm dia Stirrups : 8mm dia two legged vertical stirrups @300mm c/c Use standard anchorage and curtailment practices wherever necessary.		
4.	**I**	Draw the Plan and Longitudinal section of **R.C.C square overhead tank supported by four columns** for the given detailed specifications. Size of tank : 3000mm x 3000 mm Free board : 300 mm Thickness of RCC side wall : 150 mm Thickness of bottom RCC slab : 200mm Thickness of cover slab : 100mm Size of manhole : 600mm x 600mm Maximum depth of water : 2600 mm Size of beam at floor level : 300mm x 400mm Size of braces : 300mm x 300mm Height of columns above G.L : 7000 mm Height of columns below G.L : 300mm Depth of foundation below G.L : 1400mm Size of column footing : 1500mm x 1500mm Height of sloped portion for footing : 600 mm Top plan size of sloped portion : 450 mm x 450 mm Diameter of inlet, outlet and over flow pipes : 200mm Diameter of scour pipe : 150mm Diameter of vent pipe : 150mm	D540.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	III	Draw Plan showing (a) Top reinforcement (b) Bottom reinforcement and longitudinal and Cross section for a Doubly reinforced continuous beam (with two equal spans) using CAD for the given detailed specifications. Clear span of the beam : 5m No. of span : 2 Width of support : 300mm Clear cover : 25mm Size of beam : 300mm x 600mm	D540.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

		Reinforcement details: **Span** Tension reinforcement @ bottom : 5 nos of 20mm dia Fe415Compression reinforcement @ top : 2nos of 16mm dia **End support** Tension reinforcement @ top : 6 nos of 16mm dia Fe415 steel Compression reinforcement @bottom : 2nos of 20mm dia **Interior support** Tension reinforcement @ top : 6 nos of 16mm dia Fe415 steelCompression reinforcement @bottom : 2nos of 20mm dia **Stirrups** :8mm dia 2 legged Fe415 at 250 mm c/c Use standard anchorage and curtailment practices wherever necessary.		
5.	**II**	Draw the Elevation and Cross Section using a **steel foot over bridge** across a highway. Span of foot bridge : 20 m Width of foot bridge : 2.5m Flooring of foot bridge : timber planks Size of timber planks : 20 mm x 60 mm Nailing strip : 150 mm x 60 mm x 26.6 mm Pitch of rivets in timber flooring : 150 mm No. of panels : 10 Length of each panel : 2m Type of truss : N type Height of main truss : 1.8 m Top chord members : 2 angles of 100 mm x 65 mm x 8mm Bottom chord members : 2 angles of 60 mm x 60mm x 8 mm Vertical members (end) : 2 angles of 100 mm x 65 mm x 8mm Vertical member intermediate : 1 angle of 70 mm x 70mm x 8mm Diagonal members : 1 angle of 60mm x 60mm x8mm Rakers : 1 angle of 60 mm x 60mm x 8mm Type of joints : Rivet Diameter of rivets : 20mm	D540.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

	III	Draw Plan showing (a) Top reinforcement (b) Bottom reinforcement and cross section and longitudinal section of **Tee–beams supporting continuous slab** for the given Detailed specifications. Clear span : 8.4m Width of wall : 300mm Size of rib : 300mm x 600mm Thickness of slab : 160mm Clear cover : 25mm **Reinforcement details for beams:** Tension reinforcement : 6 nos of 25mm dia Fe415 Hanger bar : 2nos. of 12mm dia Fe415 Stirrups : 10mm dia two legged vertical stirrups @150mm c/c	D540.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
6.	**II**	Draw the Half Plan at Foundation and half plan at top and half longitudinal section and half front elevation along the road of a **Two span Tee beam bridge with square Returns** for the given detailed specifications. **Hydraulic particulars :** Bed level of canal : +18.70m Bed width : 6600mm Fully supply level : +20.00m Width of linear waterway : 6000mm Top bund level : +20.70m **Bridge particulars :** Road level : +21.00m Kerb level : +21.15m Top of parapet level : +21.85m Top of coping : +21.95 m Bottom level of parapet : +21.15 m Bottom level of Tee beam : +20.4 m Top level of RCC slab : +21.0 m Bottom level of RCC slab : +20.70 m No. of Parapet pillars : 5 Size of parapet pillars : 300 x 300 mm Length of rough stone revetment on both sides : 2.0m Thickness of revetment : 300mm Abutment and pier are in course rubble masonry in C.M.1:5 Top width of abutment : 700mm	D540.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7

		Bottom width of abutment : 1400 mm Top and Bottom width of pier : 600mm Length of return wall : 4000 mm Length of abutment and pier : 8700 mm Foundation concrete offset : 300mm Number of Tee Beams : 3 Size of rib of Tee Beams : 300mm x 300mm Size of bed block in cement concrete 1:2:4:600mmx600mmx150mm Thickness of R.C Slab : 300mm Size of R.C.C Vertical post for hand rail : 100mm x 100mm x 700mm Size of hand rail : 25mm dia pipe Width of R.C.C kerb on either side : 300mm Width of roadway : 6.7m Width of roadway in the approach : 7.7m		
	III	Draw the Plan and Longitudinal Section of **Lintel cum sunshade** using CAD for the Given detailed specifications. **Lintel :** Clear span : 2.60m Width of support on either side : 300mm Size of lintel beam : 300mm x 400mm Clear cover : 25mm **Tension reinforcement** Main bar : 4nos of 16mm dia Fe415 Hanger bar : 2nos of 12mm dia Fe 415 Stirrups: 8mm dia two legged vertical stirrups @300mm c/c. **Sunshade:** Width : 750mm Thickness : 100mm at support and 50mm at free end Main reinforcement : 8mm dia 150mm c/c Fe415 Distributors : 6mm dia 200mm c/c Fe415 Use standard anchorage and curtailment practices wherever necessary	D540.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
7.	**I**	Draw the Plan and Longitudinal section of **R.C.C square overhead tank supported by four columns** for the given detailed specifications. Size of tank : 3000mm x 3000 mm Free board : 300 mm	D540.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7

		Thickness of RCC side wall : 150 mm Thickness of bottom RCC slab : 200mm Thickness of cover slab : 100mm Size of manhole : 600mm x 600mm Maximum depth of water : 2600 mm Size of beam at floor level : 300mm x 400mm Size of braces : 300mm x 300mm Height of columns above G.L : 7000 mm Height of columns below G.L : 300mm Depth of foundation below G.L : 1400mm Size of column footing : 1500mm x 1500mm Height of sloped portion for footing : 600 mm Top plan size of sloped portion : 450 mm x 450 mm Diameter of inlet, outlet and over flow pipes : 200mm Diameter of scour pipe : 150mm Diameter of vent pipe : 150mm		
	III	Draw the Layout Plan, Elevation and Cross Section of the first flight slab of **Dog legged Staircase** using CAD for the given detailed specifications. Clear size of the staircase room : 4.9m x 2.5m Vertical height between floors : 3.3m Width of supporting wall : 200mm Rise : 150mm Tread : 250mm Width of flight : 1.2m Width of landing : 1.2m Waist slab thickness : 150mm **Reinforcement details :** Main reinforcement : 12mm dia Fe415 steel @ 200 mm c/c Distributors : 8mm dia @ 200mm c/c Use standard anchorage and curtailment practices wherever necessary.	D540.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
8.	**I**	Draw the Plan and Longitudinal section a **Septic tank with dispersion trench** for The given detailed specifications. **Septic tank :** Size : 3400mm x 1600 mm Depth : 2000mm Free board : 450 mm	D540.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7

		Manhole : 600mm x 600mm Walls of brick masonry : 450mm Slope in base concrete : 1 in 20 Base Concrete thickness at left side edge : 200mm Baffle wall thickness : 100mm Depth of baffle wall from brick liquid : 100mm Distribution chamber : 600mm x 600mm Distance of baffle wall from brick wall : 800mm Thickness of foundation concrete : 300 mm Foundation concrete offset : 100 mm : **Stone ware pipes diameter:** Inlet pipe : 150mm Tee pipe at outlet : 150mm Outlet pipe from outlet chamber to dispersion trench : 100mm Vent pipe : 50mm **Dispersion trench :** Length : 10000mm Width of the dispersion trench : 1000 mm Depth of trench below G.L : 1400 mm Turfing depth above ground level : 300 mm		
	III	Draw the Plan and Cross Section of **RCC column with square isolated footings** Using CAD for the given detailed specifications. **Column :** Size : 300mm x 300mm Clear cover : 40mm Longitudinal reinforcement : 4 nos. of 25mm dia Fe415 Lateral ties : 8mm dia Fe415 @ 300mm c/c **Footing:** Size : 2.6m x 2.6m Depth of footing: 600mm with 50mm clear cover. Reinforcement: 10nos. of 16mm dia Fe415steel in both directions. Use standard anchorage and curtailment practices wherever necessary.	D540.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
9.	**I**	Draw the Plan, and Longitudinal section of a **Rapid sand filter** for the given detailed specifications: Size of filter unit : 8000 mm x 6000 mm Size of inlet chamber : 1000 mm x 6000 mm Wall thickness at top and bottom : 400 mm and	D540.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7

		600mm Thickness of foundation : 400 mm Laterals : 80mm dia with 10mm strainers at 250mm c/c Slope of laterals : 1 in 50 Raw water inlet pipe : 300 mm dia Wash water drain pipe : 300 mm dia Size of wash water trough : 250 mm x 350mm Number of wash water trough : 3 Free board : 300mm Air laterals : 50 mm dia @ 500 mm c/c Depth of filter media : 750 mm Depth of base material : 600 mm		
	III	Draw Plan showing (a) Top reinforcement (b) Bottom reinforcement and Cross Section using CAD of the slab along Shorter span and Longer span of a **Simply supported Two–way slab** for the given detailed specifications. Size of room : 2.5m x 3.5m Width of supporting walls : 230mm Clear cover : 25mm Thickness of slab : 110mm **Reinforcement details :** Shorter span (Main reinforcement) : 8mm dia Fe415 @ 120mm c/c Longer span (Main reinforcement) : 8mm dia Fe415 @ 140mm c/c Use standard anchorage and curtailment practices wherever necessary.	D540.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
10.	Mini Project		D540.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

CED550 ENVIRONMENTAL ENGINEERING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

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

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

DETAILED ALLOCATION OF MARKS

SI. No	Description	Part - A Max. Marks (45)	Part - B Max. Marks (40)
1.	Procedure	5	5
2.	Tabulation and Observation/ Execution	20	25
3.	Calculations	10	
4.	Sketch / Graph	5	5
5.	Accuracy of result/ Finish	5	5
6.	Mini Project	10	
7.	Viva Voce	5	
	Total	**100**	

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

EQUIPMENTS REQUIRED

SI. 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.	Turbidimeter	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	1no.
14.	Crucible	1 no.
15.	Whattman filter paper	Required no.
16.	Wash bottle	2 nos.
17.	Pipette, Burette, Funnel, Conical flask, Beaker, Bunsen burner, Stand, Wire gauge, Filter paper	As required

OBJECTIVES:

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

- Determine the quality of water, testing procedures and standards for drinking water.
- Understand the Cutting, threading and joining of G.I. Pipes / cutting and pasting of PVC pipes using solvents.
- Make suction and delivery pipe connections to a centrifugal pump (making indents, drawing a neat sketch of the connection with details).

COURSE OUTCOMES:

Course	CED550 ENVIRONMENTAL ENGINEERING LABORATORY
After successful completion of this course, the students will be able to	
D550.1	Collection of Water Sample - Physical, Chemical, Bacteriological Tests
D550.2	Learn the Necessity of Disinfection, suspended solid sand dissolved solids present in the given sample of water
D550.3	Understand the "Temporary and permanent Hardness" Study of sanitary wares
D550.4	Understand the Making suction and delivery pipe connections and cutting, threading and joining of G.I.Pipes
D550.5	Learn the air pollution control equipments and develop the mini projects with report.

CED550 ENVIRONMENTAL ENGINEERING LABORATORY

PART A

1. Collection of water samples from sources and "Estimation of Sulphate content" in water sample.
2. Determination pH of value by Electrometric method using pH meter/ Calorimetric method and comparison by paper method.
3. Determine the optimum dose of coagulant in a given raw water sample by jar test.
4. Determine the dissolved oxygen in the given sample of water.
5. Determination of suspended solid sand dissolved solids present in the given sample of water / wastewater.
6. Determination of "Temporary and permanent Hardness" present in the given sample of water by EDTA titration method.
7. Estimation of chlorides in the given sample of water by silver Nitrate titration method.
8. Prepare a report of a field visit to water treatment plant.

PART B

1. Study of pipe fitting used in water supply (with actual models displayed on board).
2. Study of sanitary wares (with actual models displayed on board).
3. Cutting, threading and joining of G.I.Pipes / cutting and pasting of PVC pipes using solvents.
4. Making a bathroom connection from an existing water supply main (making indents, drawing a neat sketch of the connection with details.
5. Making suction and delivery pipe connections to a centrifugal pump (making indents, drawing a neat sketch of the connection with details).
6. Study of air pollution control equipments (Gravity settling chamber, Cyclone filter with models/devices)
7. Prepare a report of a field visit to sewage treatment plant.
8. Study of piping connection details in an Residential Buildings
9. Mini Project
   The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES

1. https://onlinecourses.nptel.ac.in/noc19_ge22/preview
2. NPTEL :: Chemical Engineering - Environmental Engineering
3. https://youtube.videoken.com/embed/C8ghKCUfcQk

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure/observation/output	
Other practical related works	- 10 marks
Record writing	- 10 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D550.1	3	2	2	3	2	2	3	3	2	1
D550.2	3	2	2	3	2	2	3	3	2	1
D550.3	3	2	2	3	2	2	3	3	2	1
D550.4	3	2	2	3	2	2	3	3	2	1
D550.5	3	2	2	3	2	2	3	3	2	1
D550 Total	15	10	10	15	10	10	15	15	10	5
Correlation level	3	2	2	3	2	2	3	3	2	1

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED550 ENVIRONMENTAL ENGINEERING LABORATORY

Model Question Paper

Time: 3 Hrs. **Max. Marks.100**

SI NO		Answer the following questions part A; questions carries 45 marks part B; questions carries 40 marks	CO	PO
1.	A.	"Estimate Sulphate content" in the given water sample.	D550.1	PO1,PO2,PO5,PO6,PO7
	B.	Do Cutting, threading and joining for the given G.I. Pipes / cutting and pasting of PVC pipes using solvents	D550.4	PO1,PO2,PO5,PO6,PO7
2.	A.	Determine Ph value by Electrometric method using pH meter/ Calorimetric method and compare by paper method.	D550.1	PO1,PO2,PO5,PO6,PO7
	B.	Make a bathroom connection from an existing water supply main (making indents, drawing a neat sketch of the connection with details).	D550.4	PO1,PO2,PO5,PO6,PO7
3.	A.	Determine the optimum dose of coagulating the given raw water by jar test.	D550.2	PO1,PO2,PO5,PO6,PO7
	B.	Make suction and delivery pipe connections to the given centrifugal pump along making indents, drawing a neat sketch of the connection with details.	D550.4	PO1,PO2,PO5,PO6,PO7
4.	A.	Determine the dissolved oxygen in the given sample of water.	D550.1	PO1,PO2,PO5,PO6,PO7
	B.	Do Cutting and pasting of PVC pipes using solvents.	D550.4	PO1,PO2,PO5,PO6,PO7
5.	A.	Determine suspended solid sand dissolved solids present in the given sample of water / wastewater.	D550.2	PO1,PO2,PO5,PO6,PO7
	B.	Make a bathroom connection from an existing water supply main (making indents, drawing a neat sketch of the connection with details).	D550.4	PO1,PO2,PO5,PO6,PO7
6.	A.	Determine "Temporary and permanent Hardness" present in the given sample of water by EDTA titration method.	D550.2	PO1,PO2,PO5,PO6,PO7
	B.	Do Cutting, threading and joining for the given G.I.Pipes / cutting and pasting of PVC pipes using solvents	D550.4	PO1,PO2,PO5,PO6,PO7
7.	A.	Estimate chlorides in the given sample of water by silver Nitrate titration method.	D550.3	PO1,PO2,PO5,PO6,PO7
	B.	Do Cutting and pasting of PVC pipes using solvents	D550.4	PO1,PO2,PO5,PO6,PO7
8.	Study of piping connection details in an Residential Building		D550.4	PO1,PO2,PO5,PO6,PO7
9.	Mini Project		D550.5	PO1,PO2,PO5,PO6,PO7

CED561 ADVANCED SURVEYING AND BASIC GIS PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Course	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Autonomous Examinations	Total	
ADVANCED SURVEYING AND BASIC GIS 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**

DETAILED ALLOCATION OF MARKS

SI. No	Description	Max. Marks (100)
1.	Procedure	10
2.	Tabulation and Observation	30
3.	Calculations	25
4.	Sketch / Graph	10
5.	Accuracy of result	10
6.	Viva Voce	5
7.	Mini Project	10
	Total	**100**

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

Equipments Required: (30 Students)

SI. 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

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 OUTCOMES:

Course	**CED561 ADVANCED SURVEYING AND BASIC GIS PRACTICAL**
After successful completion of this course, the students will be able to	
D561.1	Understand the Remote Sensing and GIS
D561.2	Analyze Creating and editing Shape files in ARC MAP
D561.3	Learn about the Geo referencing an image using ARC GIS
D561.4	Understand to Buffering and Clipping.
D561.5	Understand to create Querying the data and develop the mini projects with report.

CED561 ADVANCED SURVEYING AND BASIC GIS PRACTICAL

SI.NO **Remote Sensing Exercises:**

1. Introduction to Remote Sensing and GIS and creating a map using tools.
2. Introduction to ARC GIS Desktop.
3. Geo referencing an image using ARC GIS.
4. Creating and editing Shape files in ARC MAP.
5. Editing in ARC MAP.
6. Adding fields to a Shape file.
7. Querying the data.
8. Buffering and Clipping.
9. Case study of creation of campus map using Arc GIS Software.
10. Mini Project

    The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES:

1. https://www.nptel.ac.in/courses/105/107/105107122
2. Untitled Document (nptel.ac.in)
3. https://youtu.be/KTXDlBAFVYU
4. https://youtu.be/KJim1okqKnA

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure/observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks
Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D561.1	3	2	3	2	2	2	3	3	2	2
D561.2	3	2	3	2	2	2	3	3	2	2
D561.3	3	2	3	2	2	2	3	3	2	2
D561.4	3	2	3	2	2	2	3	3	2	2
D561.5	3	2	3	2	2	2	3	3	2	2
D560 Total	15	10	15	10	10	10	15	15	10	10
Correlation level	3	2	3	2	2	2	3	3	2	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED561 ADVANCED SURVEYING AND BASIC GIS PRACTICAL

Model Question Paper

SI.NO	Answer the following question and the each questions carries 85 marks	CO	PO
1.	Create a map using GIS Tools.	D561.1	PO1,PO2,PO3,PO4,PO5 ,PO7
2.	Carry out Geo Referencing an image using ARC GIS.	D561.3	PO1,PO2,PO3,PO4,PO5 ,PO7
3.	Create and edit shape files in ARC MAP.	D561.2	PO1,PO2,PO3,PO4,PO5 ,PO7
4.	Edit the given image using ARC MAP as per given instructions.	D561.2	PO1,PO2,PO3,PO4,PO5 ,PO7
5.	Add fields tie for the given shape file.	D561.3	PO1,PO2,PO3,PO4,PO5 ,PO7
6.	Perform various queries with Arc Map Tool.	D561.2	PO1,PO2,PO3,PO4,PO5 ,PO7
7.	Carry out buffering and clipping for the given shapes.	D561.4	PO1,PO2,PO3,PO4,PO5 ,PO7
8.	Mini Project	D561.5	PO1,PO2,PO3,PO4, PO5,PO7

CED562 CONCRETE TECHNOLOGY PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
	Hours/ Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Autonomous Examinations	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**

DETAILED ALLOCATION OF MARKS

SI.No	Description	PART A (35 MARKS)	PART B (50 MARKS)
1.	Procedure	5	10
2.	Tabulation and Observation	15	20
3.	Calculations	5	10
4.	Sketch / Graph	5	5
5.	Accuracy of result	5	5
6.	Viva Voce	5	
7.	Mini Project	10	
	Total		**100**

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

EQUIPMENTS REQUIRED:

SI.NO	Name 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

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 slump cone, compaction factor and Vee Bee consistometer tests.
- Know the arrangement of steel reinforcement for concrete elements
- Study the workability properties of self compacting concrete.

COURSE OUTCOMES:

Course	CED562 CONCRETE TECHNOLOGY PRACTICAL
After successful completion of this course, the students will be able to	
D562.1	Understand the materials properties
D562.2	Analyze various concrete test
D562.3	Understand the various coarse aggregate test
D562.4	Understand the various fine aggregate test
D562.5	Understand the test and workability of concrete and develop the mini projects with report.

CED562 CONCRETE TECHNOLOGY PRACTICAL

PART-A

1. Determination of the fineness of cement by Blains Permeability Apparatus or by sieve analysis.
2. Determination of Initial setting time of cement by using Vicat's Apparatus
3. Determination of final setting time of cement by using 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

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 particle size distribution curve and also find the effective size and uniformity co-efficient.
12. Determination of Fineness Modulus of coarse aggregate sample by Conducting sieve analysis.
13. Vee- Bee Consistometer Test on concrete test.
14. Study of workability of self compacting concrete.
15. Mini Project

    The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES

1. https://www.nptel.ac.in/courses/105/104/105104030
2. https://youtu.be/Y4kKLvLitSk
3. https://youtube.videoken.com/embed/NRSfUsNTPSs

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure/observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks
Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D562.1	2	2	3	3	3	3	3	2	3	2
D562.2	2	2	3	3	3	3	3	2	3	2
D562.3	2	2	3	3	3	3	3	2	3	2
D562.4	2	2	3	3	3	3	3	2	3	2
D562.5	2	2	3	3	3	3	3	2	3	2
Total	10	10	15	15	15	15	15	10	15	10
Correlation level	2	2	3	3	3	3	3	2	3	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED562 CONCRETE TECHNOLOGY PRACTICAL

Time 3hrs **Model Question Paper** **Max. Marks: 100**

SI NO	Answer the following questions part A; questions carries 35 marks part B; questions carries 50 marks		CO	PO
1.	A	Conduct shape test for the given coarse aggregate and determine Flakiness index.	D562.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
	B	Conduct slump test for 1:2:4 concrete mix with w/c ratio 0.50, 0.55 and 0.60 and draw a graph "w/c ratio Vs slump".	D562.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
2.	A	Determine the normal consistency of cement by Vicat's test .	D562.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
	B	Conduct compaction factor test on 1:2:4 concrete mix with w/c ratios of 0.45,0.5 and 0.55 and draw a graph "w/c ratio Vs compaction factor"	D562.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
3.	A	Determine the fineness of cement by Sieve analysis.	D562.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
	B	i) Cast a concrete cube of size 150mm×150mm ×150mm using 1:2:4 concrete mix with standard compaction. (25 Marks) ii)Conduct a compression test on the already cured concrete cube and find its ultimate compressive strength(25 Marks)	D562.2 D562.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
4.	A	Determine the fineness of cement by Blains Permeability apparatus.	D562.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
	B	Determine the fineness modulus of the given sample of sand by sieve analysis. Draw the particle size distribution curve and find the effective size and uniformity coefficient of the sample.	D562.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
5.	A	Determine the initial setting time of cement by Vicat's test.	D562.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
	B	Determine the fineness modulus of the given coarse aggregate by sieve analysis. Draw the particle size distribution curve and find the effective size and uniformity coefficient of the sample.	D562.3	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
6.	A	Determine the normal consistency of cement by Vicat's test.	D562.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
	B	Conduct Vee- Bee test on 1:2:4 concrete mix with at least three w/c ratios and draw a graph "w/c ratio Vs Vee Bee time..	D562.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
7.	A	Conduct shape test for the given coarse aggregate and determine. Angularity number test.	D562.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
	B	Conduct slump test for 1:2:4 concrete mix with w/c ratio 0.45, 0.5, 0.55 and 0.60 and draw a graph "w/c ratio Vs slump".	D562.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
8.	A	Conduct shape test for the given coarse aggregate and determine elongation index.	D562.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
	B	Determine the fineness of modulus of Coarse Aggregate sample.	D562.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
9.	A	Conduct slump test for 1:1½:3 mix for water cement ratio of 0.5, 0.55 and 0.6 and draw graph. (35 Marks)	D562.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
	B	Find the maximum building of the given sand sample and draw graph.	D562.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
10	Mini Project		D562.5	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7

CED563 GEOTECHNICAL ENGINEERING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examinations			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	Autonomous Examinations	Total	
GEOTECHNICAL ENGINEERING LABORATORY	3	48	25	100*	100	3 Hours

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

DETAILED ALLOCATION OF MARKS

SI.No	Description	Max.Marks (100)
1.	Procedure	10
2.	Tabulation and Observation	30
3.	Calculations	25
4.	Sketch / Graph	10
5.	Accuracy of result	10
6.	Viva Voce	5
7.	Mini Project	10
	Total	**100**

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

EQUIPMENT REQUIRED:

SI.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.

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 through various tests.
- Know the procedure for performing CBR test.
- Learn various compaction methods for soil stabilization.
- Study the SPT at construction site.

COURSE OUTCOMES:

Course	CED563 GEOTECHNICAL ENGINEERING LABORATORY
After successful completion of this course, the students will be able to	
D563.1	Understand the properties of soil, rock
D563.2	Analyze dry density of soil through various tests.
D563.3	Understand the shear strength of soil.
D563.4	Understand the procedure for performing CBR and SPT test.
D563.5	Understand the stages of soil condition tests and develop the mini projects with report.

CED563 GEOTECHNICAL ENGINEERING LABORATORY

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 as per IS 2720 (Part- IV).
5. Use different types of soil to identify and classify soil by conducting field tests- Through Visual inspection, Dry strength test, Dilatancy test and Toughness test.
6. Determine coefficient of permeability by constant head test as per IS 2720 (Part-XVII).
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.
14. Mini Project

    The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES

1. https://nptel.ac.in/courses/105/101/105101160
2. https://www.youtube.com/watch?v=lQ-cyCB2-so
3. NDLI: Soil-water interaction (iitkgp.ac.in)

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure/observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks
Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D563.1	3	3	3	2	3	2	2	3	2	3
D563.2	3	3	3	2	3	2	2	3	2	3
D563.3	3	3	3	2	3	2	2	3	2	3
D563.4	3	3	3	2	3	2	2	3	2	3
D563.5	3	3	3	2	3	2	2	3	2	3
D563 Total	15	15	15	10	15	10	10	15	10	15
Correlation level	3	3	3	2	3	2	2	3	2	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED563 GEOTECHNICAL ENGINEERING LABORATORY

Model Question Paper

Time: 3Hrs. **Max. Marks: 100**

SI. NO	Answer the following questions and each questions carries 85 marks	Co	Po
1.	Determine water content of given soil sample by oven drying	D563.1	PO1,PO2,PO3, PO4,PO5,PO7
2.	Determine Shrinkage limit of given soil sample	D563.1	PO1,PO2,PO3, PO4,PO5,PO7
3.	Determine grain size distribution of given soil sample by mechanical sieve analysis.	D563.2	PO1,PO2,PO3, PO4,PO5,PO7
4.	Use different types of soil to Identify and Classify the sample of soils by visual inspection and dry strength test.	D563.2	PO1,PO2,PO3, PO4,PO5,PO7
5.	Classify the sample of soils by visual inspection and Dilatancy test.	D563.3	PO1,PO2,PO3, PO4,PO5,PO7
6.	Classify the sample of soils by visual inspection and Toughness test.	D563.4	PO1,PO2,PO3, PO4,PO5,PO7
7.	Determine coefficient of permeability by constant head test.	D563.3	PO1,PO2,PO3, PO4,PO5,PO7
8.	Determine coefficient of permeability by falling head test.	D563.4	PO1,PO2,PO3, PO4,PO5,PO7
9.	Determine shear strength of soil by triaxial shear test.	D563.4	PO1,PO2,PO3, PO4,PO5,PO7
10.	Determine shear strength of soil by vane shear test.	D563.5	PO1,PO2,PO3, PO4,PO5,PO7
11.	Determine the consolidation properties of given soil sample.	D563.5	PO1,PO2,PO3, PO4,PO5,PO7
12.	Find the unconfined compressive strength of given clay sample.	D563.4	PO1,PO2,PO3, PO4,PO5,PO7
13.	Identify the given rock specimen and give the report	D563.1	PO1,PO2,PO3, PO4,PO5,PO7
14.	Mini Project	D563.5	PO1,PO2,PO3, PO4,PO5,PO7

CED570 ENTREPRENEURSHIP AND STARTUPS

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16weeks

Subject	Instructions		Examination			
	Hours / Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Board Examination	Total	
ENTREPRENEURSHIP AND STARTUPS	**4 Hrs**	**64 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	NO.OF HOURS
I	Entrepreneurship – Introduction and Process	10
II	Business Idea and Banking	10
III	Start ups, E-cell and Success Stories	10
IV	Pricing and Cost Analysis	10
V	Business Plan Preparation	10
Field visit and Preparation of case study report		14
Total		64

COURSE DESCRIPTION:

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 study of 5th semester the students will be able to

- To excite the students about entrepreneurship
- Acquiring Entrepreneurial spirit and resourcefulness
- Understanding the concept and process of entrepreneurship
- Acquiring entrepreneurial quality, competency and motivation
- Learning the process and skills of creation and management of entrepreneurial venture
- Familiarization 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
- Understand the formation of E-cell
- Survey and analyze the market to understand customer needs
- Understand the importance of generation of ideas and product selection
- Learn the preparation of project feasibility report
- Understand the importance of sales and turnover
- Familiarization of various financial and non financial schemes
- Aware the concept of incubation and starts ups

COURSE OUTCOMES

Course	**CED570 ENTREPRENEURSHIP AND STARTUPS**
After successful completion of this course, the students should be able to	
D570.1	Understand the concept and process of Entrepreneurship.
D570.2	Familiarize about business idea and banking.
D570.3	Understand the formation of E-Cell, start-ups and success stories.
D570.4	Aware the human resources and industrial legislation.
D570.5	Learn about the business plan preparation and develop the mini projects with report.

CED570 ENTREPRENEURSHIP AND STARTUPS

UNIT I **[10 Hrs]**

ENTREPRENEURSHIP – INTRODUCTION AND PROCESS

Concept, Functions and Importance	[1 Hr]
Myths about Entrepreneurship	[1 Hr]
Pros and Cons of Entrepreneurship	[1 Hr]
Process of Entrepreneurship	[1 Hr]
Benefits of Entrepreneur	[1 Hr]
Competencies and Characteristics	[1 Hr]
Ethical Entrepreneurship, Entrepreneurial Values and Attitudes	[1 Hr]
Motivation, Creativity, Innovation	[1 Hr]
Entrepreneurs - as problem solvers	[1 Hr]
Mindset of an employee and an entrepreneur Business Failure – causes and remedies, Role of Networking in entrepreneurship	[1 Hr]

UNIT II **[10 Hrs]**

BUSINESS IDEA AND BANKING

Types of Business: Manufacturing, Trading and Services	[1 Hr]
Stakeholders: Sellers, Vendors and Consumers and competitors	[1 Hr]
E- Commerce Business Models	[1 Hr]
Types of Resources - Human, Capital and Entrepreneurial tools	[1 Hr]
Goals of Business and Goal Setting	[1 Hr]
Patent, copyright and Intellectual Property Rights	[1 Hr]
Negotiations - Importance and methods, Customer Relations and Vendor Management	[1 Hr]
Size and Capital based classification of business enterprises	[1 Hr]
Role of Financial Institutions, Role of Government policy, Entrepreneurial support systems	[1 Hr]
Incentive schemes for State Government, Incentive schemes for central Government.	[1 Hr]

UNIT III **10 Hrs**

STARTUPS, E-CELL AND SUCCESS STORIES

Concept of Incubation centre's	[1 Hr]
Activities of DIC, financial institutions and other relevance institutions	[1 Hr]
Success stories of Indian and global business legends	[1 Hr]
Field Visit to MSME's	[1 Hr]

Various sources of Information [1 Hr]

Learn to earn [1 Hr]

Startup and its stages [1 Hr]

Role of Technology – E-commerce and Social Media [1 Hr]

Role of E-Cell [1 Hr]

E-Cell to Entrepreneurship [1 Hr]

UNIT IV

4.1 HUMAN RESOURCE MANAGEMENT **[10 Hrs]**

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 - [1 Hr]

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.- [2 Hrs]

The Building and Other Construction Workers (Regulation of Employment and Condition of Services) Central Rules, 1998 [1 Hr]

4.2 INDUSTRIAL LEGISLATION [1 Hr]

Need of Industrial legislation-Indian Factories Act – 1948 –Definition of Factory, main provisions regarding health, Safety and [1 Hr]

Welfare of Workers-Industrial Dispute Act – 1947 – Definition of Industrial dispute, Machineries for settlement of Industrial dispute in India [1 Hr]

4.3 MICRO AND SMALL ENTERPRISES [2 Hrs]

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 [1 Hr]

UNIT V

PREPARATION OF PROJECT REPORTS FOR: **[10 Hrs]**

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. [2 Hrs]

5.2 PROJECT PROFILE/PRE-FEASIBILITY REPORT

Introduction of the product - Market.- Man Power (PersonnelRequired).- Manufacturing Process- Plant and Machinery. [1 Hr]

Cost of Project

Means of Finance- Cost of Production- Annual Turnover- Profit -Profit on Investment. [1 Hr]

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 - [2 Hrs]

Requirement of Raw materials, Consumables, Utilities and Working Capital - Organisational Structure, Management and Man Power-Project Implementation Schedule - Profitability and Cash Flow. [2 Hrs]

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. [2 Hrs]

Field visit and Preparation of case study report [14 Hrs]

TEXT BOOKS:

Sl.No	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Essentials of Entrepreneurship and small business management	M.Scarborough, R.Cornwell,	Pearson Education India, Noida - 201301

REFERENCE BOOKS:

Sl.No	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Fundamentals of Entrepreneurship	Dr. G.K. Varshney,	Sahitya Bhawan Publications, Agra - 282002
2.	Business Regulatory Framework	Dr. G.K. Varshney,	Sahitya Bhawan Publications, Agra - 282002
3.	Essentials of Entrepreneurship and small business management	M.Scarborough, R.Cornwell,	Pearson Education India, Noida - 201301

DETAILED ALLOCATION OF MARKS

SI. No	Description	Marks
Part A	Written Examination - Theory Question and answer (10 questions x 3 marks:30 marks & (3 questions x 5 marks: 15 marks)	45
Part B	Practical Examination – Submission on Business Plan/Feasibility Report or Report on Unit IV&V	40
Part C	Viva voce	15
	TOTAL	**100**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D570.1	3	3	2	2	2	3	2	2	2	2
D570.2	3	3	2	2	2	3	2	2	2	2
D570.3	3	3	2	2	2	3	2	2	2	2
D570.4	3	3	2	2	2	3	2	2	2	2
D570.5	3	3	2	2	2	3	2	2	2	2
D570 Total	15	15	10	10	10	15	10	10	10	10
Correlation level	3	3	2	2	2	3	2	2	2	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

CED570 ENTREPRENEURSHIP AND STARTUPS

MODEL QUESTION PAPER

PART-A (10 X 3= 30Marks)					
Note: Answer all questions. All questions carry equal marks					
S.No	**Questions**	**UNIT**	**Bloom's Level**	**CO**	**PO**
1	Define entrepreneurship.	I	U	D570.1	PO1,PO2,PO3
2	State the process of entrepreneurship.	I	R	D570.2	PO1,PO2,PO3
3	What are the benefits of being an entrepreneur?	II	U	D570.1	PO1,PO2,PO3
4	How do entrepreneurs act as problem solvers?	II	U	D570.1	PO1,PO2,PO3
5	Outline the role of networking in entrepreneurship.	III	R	D570.1	PO1,PO2,PO3
6	List the various types of business.	III	R	D570.2	PO1,PO2,PO3
7	Outline the business model.	IV	U	D570.2	PO1,PO2,PO3
8	Suggest the various goals of business.	IV	U	D570.2	PO1,PO2,PO3
9	How selection of human resources is carried out?	IV	U	D570.4	PO1,PO2,PO3
10	Specify the role of government policy on entrepreneurship.	V	R	D570.4	PO1,PO2,PO3

					(3 X 5 = 15Marks)
Note: Answer all questions. All questions carry equal marks					
S.No	**Questions**	**UNIT**	**Bloom's Level**	**CO**	**PO**
11	Describe the importance of innovation on entrepreneurship.	I	An	D570.1	PO1,PO2,PO3
12	Enumerate the various incentive schemes for the central government.	II	U	D570.4	PO1,PO2,PO3
13	How technology will play a major role in E-commerce?	III	R	D570.3	PO1,PO2,PO3
PART-C (1 X 40 = 40 Marks)					
14.	Practical Examination– Submission on Business Plan / Feasibility Report or Report On Unit 4 & 5	IV, V	R	D570.4 D570.5	PO1,PO5,PO6,PO7
Viva voce = 15 Marks					

CED510 STRUCTURAL ENGINEERING

MODEL QUESTION PAPER

Time: 3 Hrs **Max. Marks: 100**

Note: Answer all questions. All questions carry equal marks

	PART- A					Marks 10X3=30
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**Blooms Level**	**CO**	**PO**	
1.	Differentiate between singly and doubly reinforced beams.	I	U	D510.1	PO1,PO2	
2.	State the design consideration usually made in assessing the depth of beam.	I	U	D510.1	PO1,PO2	
3.	What is the max spacing of shear reinforcement according to IS 456-2000?	II	R	D510.2	PO1,PO2,PO3,PO4	
4.	Write the code provisions for a beam regarding. a. Minimum area tension reinforcement b. Maximum area tension reinforcement c. Maximum area compression reinforcement	II	U	D510.2	PO1,PO2,PO3,PO4, PO5	
5.	Define one way and two way slab	III	U	D510.3	PO1,PO2,PO3	
6.	Draw a c/s of simply supported slab and show its main and secondary reinforcement	III	U	D510.3	PO1,PO2,PO3	
7.	Mention the different classifications of column based on slenderness ratio.	IV	U	D510.4	PO1,PO2,PO3	
8.	Explain the places where combined footing and mat footing are provided.	IV	U	D510.4	PO1,PO2	
9.	Define shape factor.	V	U	D510.5	PO1,PO2	
10.	Expand a. ISMC b. ISWB	V	U	D510.5	PO1,PO2,PO3	
	PART- B					**Marks 5X14=70**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11. a	A reinforced concrete simply supported beam 200 mm wide and 500 mm deep effective is reinforced with 3 Nos of 16 mm dia bars. Find the moment of resistance of the beam. Effective span is 5 m. Find the safe working load. If the effective cover is 40 mm, find the safe working load M20 and Fe250 used.	14	I	AN	D510.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	A simply supported rectangular beam of 4 m span carries a uniformly distributed characteristics load addition it's self-weight of 20 kN/m. The beam section is 230 mm X 450 mm overall .Design the beam using M20 grade concrete and Fe415 Steel.	14	I	AN	D510.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7

12 a	A single reinforced T beam has a flange width of 1400 mm and a flange thickness of 120 mm. it is reinforced with 4 Nos of 20 mm dia bars Fe415 steel at an effective depth of 450 mm. The breadth of web is 230mm. Concrete grade is M20. Find the M.R of the section at the limit state of collapse.	14	II	AN	D510.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	(OR)					
b	Design the shear reinforcement for a RC rectangular beam of size 250 mm X 500 mm (effective).M20 and Fe500 are used. Percentage of steel is 0.85% and factored shear force is 180 KN.	14	II	AN	D510.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
13 a	Design a simply supported roof slab for a room of 4mx12m clear size using M20 grade concrete and Fe500 grade steel; width of wall all around is 300mm.No access is provided to the roof. Weight of weathering course is 1.25 kN/m^2.	14	III	AN	D510.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	(OR)					
b	Design the waist slab of a staircase which is supported at top and bottom risers by 250mm wide R.C beams spanning parallel with the risers using M20 and Fe415 carry an imposed udl of $5000N/m^2$.The rise and tread of each step are 160mm and 275mm respectively. No of steps in one flight is 10.Weight of brick work $19000N/m^3$ weight of floor finish 800 N/m^2. Clear width of staircase 1.5m and one of its edge is embedded in to the masonry wall for a length of 120mm.	14	III	AN	D510.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
14 a	Design a short square column using M25 grade concrete and Fe500 steel to carry an axial load of 1000kN by limit state method.	14	IV	AN	D510.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	(OR)					
b	Design a square RC footing of uniform thickness for a RCC column 500X500 size, to support a load of 2000kN, using M20 and Fe 500 grade of concrete and steel respectively. Assume SBC of soil is $150kN/m^2$. Design only for effective depth and area of steel only.	14	IV	AN	D510.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
15 a	Design a tie member using a single channel section to carry an axial load of 850 kN. f_y= 450 MPa f_u = 570 MPa. The member will be connected at its ends through its web by side fillet welds of 300 mm length each.	14	V	AN	D510.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

	(OR)					
b	A single angle ISA 90x60x10mm is to be connected at its ends to 8mm thick gussets by fillet welds through one leg along the three sides and used as a tension member. Determine the design strength of the angle when it is connected through (a) its longer leg and (b) its shorter leg to the gusset. Take f_y=300N/mm^2 and f_u=440N/mm^2 for steel. The length of weld along the length direction is 125mm.	14	V	AN	D510.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as Presented below:

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

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CED520 ENVIRONMENTAL ENGINEERING

MODEL QUESTION PAPER

Note: Answer all questions. All questions carry equal marks

	PART- A					**Marks 10X3=30**
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**Blooms Level**	**CO**		**PO**
1.	What are the sources of water?	I	R	D520.1		PO1,PO2,
2.	Define intake and mention the types of intake.	I	U	D520.1		PO1,PO2,PO3
3.	What are the objects of water treatments?	II	R	D520.2		PO1,PO2,PO3,
4.	What is purpose of sedimentation?	II	R	D520.2		PO1,PO2,PO3
5.	What is meant by combined system?	III	R	D520.3		PO1,PO2
6.	What is meant dead end system?	III	R	D520.3		PO1,PO2
7.	What is the purpose of sanitization?	IV	R	D520.4		PO1,PO2
8.	What are the types of sewage pumps?	IV	R	D520.4		PO1,PO2
9.	State any two limitations of EIA.	V	U	D520.5		PO1,PO2,PO3
10.	What are the necessities of solid waste disposal?	V	R	D520.5		PO1,PO2,PO3,PO4
	PART- B					**Marks 5X14=70**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11. a	i. Explain in detail about underground water sources ii. What are the different methods if predicting the population? explain	14	I	U R	D520.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. Describe canal intake with neat sketch. ii. Explain about the laying and testing of pipe lines	14	I	R U	D520.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
12. a	i. Describe the construction and operation of a rapid sand filter. ii. State the necessity of disinfection and specify the methods of disinfection.	14	II	U R	D520.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. What is the purpose of sedimentation tanks and specify the types. ii. What is turbidity? How is it measured?	14	II	R R	D520.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
13. a	i. Explain systems of water supply. ii. State and explain the types of service reservoirs.	14	III	U R	D520.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. Compare the continuous and intermittent system of water supply. ii. How will you prepare preparation of	14	III	U R	D520.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7

	water supply scheme or project?					
14. a	i. Explain the treatment of sewage by activated sludge process with the help of a flow diagram ii Write short notes on a) Collection and conveyance of solid waste b) Energy from waste	14	IV	U R	D520.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. What are sanitary fittings? State and explain any four sanitary fittings with sketches ii. Describe drainage arrangements in building.	14	IV	R U	D520.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
15. a	i. State the effects of water pollution and explain the measures to be taken to prevent water pollution ii. Write short notes on ozone layer depletion.	14	V	AN R	D520.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. State the limitations of EIA ii. How is the environmental impact statement prepared?	14	V	U U	D520.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as Presented below:

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

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CED531 REMOTE SENSING AND GEOINFORMATICS

MODEL QUESTION PAPER

Time: 3 Hrs **Max. Marks: 100**

Note: Answer all questions. All questions carry equal marks

	PART- A					Marks 10X3=30
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**BLOOMS LEVEL**	**CO**	**PO**	
1.	How does the "human factor" enter into GIS development and implementation?	I	R	D531.1	PO1,PO2,PO3	
2.	How would you distinguish among GIS, CAD?	I	U	D531.1	PO1,PO2,PO3	
3.	What is image enhancement?	II	R	D531.2	PO1,PO2	
4.	What is image classification?	II	R	D531.2	PO1,PO2	
5.	Why are digital forms used?	III	R	D531.3	PO1,PO2	
6.	How are digital numbers used in application to remote sensing images?	III	R	D531.3	PO1,PO2,PO3	
7.	What is the numerical range of values most often associated with remote sensing data?	IV	R	D531.4	PO1,PO2,PO3	
8.	Describe the characteristics of a digital image	IV	U	D531.4	PO1,PO2	
9.	List four trends in GIS technology?	V	R	D531.5	PO1,PO2,PO3,PO4,	
10.	What is a scale in GIS?	V	R	D531.5	PO1,PO2	
	PART- B					**Marks 5X14=70**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11. a	i. Differentiate between unsupervised classification and supervised classification. ii. Explain about electromagnetic radiation	14	I	R U	D531.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. What are advantages to be gained by multisensory image merging? ii. What are the five basic steps for image classification?	14	I	R R	D531.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
12. a	i. How many ratio combinations are possible with the four bands of the MSS? ii. What are the advantages to be gained by multi sensor merging?	14	II	AN R	D531.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i.Why is it useful to view GIS as a process rather than merely software of hardware? ii.What are the other image variations which computers can produce from the input data?	14	II	R R	D531.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7

13. a	i.According to William E.Huxhold (1991) in Chapter 7 An Introduction to Urban Geographic Information Systems ii.What is the size in pixels of a MSS Land sat image, a TM Land sat image, a HRV multispectral SPOT image and a HRV panchromatic SPOT image?	14	III	R R	D531.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. Describe the characteristics of a digital image. ii. What are the advantages to be gained by multi sensor image merging?	14	III	U R	D531.3	PO1,PO2,PO3,PO4,PO5,PO6,PO7
14. a	i. What three issues are most critical to the overall success or failure of a GIS project? ii. Describe the difference between raster and vector data models used to represent maps in a GIS.	14	IV	R U	D531.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. Describe the differences between raster and vector based GIS? ii. Summarize the various definitions of a GIS .What elements do each have in common?	14	IV	U R	D531.4	PO1,PO2,PO3,PO4,PO5,PO6, PO7
15. a	i. Paper and digital maps are sometimes referred to as "dumb maps."Why they and what are would make them "intelligent?" ii. Describe the differences between raster and vector based GIS?	14	V	AN R	D531.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i.Explain the differences between attribute and spatial data with examples. ii.What is the difference between projected coordinated system and geographic coordinate system?	14	V	U R	D531.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as Presented below:

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

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CED532 CONCRETE TECHNOLOGY

MODEL QUESTION PAPER

Time: 3 Hrs **Max. Marks: 100**

Note: Answer all questions. All questions carry equal marks

	PART- A				**Marks 10X3=30**
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**BLOOMS LEVEL**	**CO**	**PO**
1.	What are the functions of cement?	I	R	D532.1	PO1,PO2,PO3,
2.	What are the properties of good sand?	I	R	D532.1	PO1,PO2,PO3,
3.	What are the classifications of admixtures?	II	R	D532.2	PO1,PO2,PO3,
4.	Define mix design.	II	U	D532.2	PO1,PO2,PO3,
5.	What is polymer concrete?	III	R	D532.3	PO1,PO2
6.	What are the advantages of pre-stressed concrete?	III	U	D532.3	PO1,PO2,PO3,
7.	What are the classifications of light weight concrete?	IV	R	D532.4	PO1,PO2,PO3,
8.	What are the requirements of formwork?	IV	R	D532.4	PO1,PO2,PO3,
9.	What is an expansion joint?	V	R	D532.5	PO1,PO2,PO3,
10.	What are the methods of repairing concrete works?	V	R	D532.5	PO1,PO2,PO3, PO4

	PART- B					**Marks 5X14=70**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11. a	i. Briefly explain the ingredients of concrete. ii. State the advantages of adding pozzolana in cement.	14	I	U R	D532.1	PO1,PO2,PO3, PO4,PO7
(OR)						
b	i. Explain the properties of concrete ii. Explain the requirements of aggregate.	14	I	U U	D532.1	PO1,PO2,PO3, PO4,PO7

12. a	i. What are various functions of admixtures? ii. Explain air entraining admixtures.	14	II	R U	D532.2	PO1,PO2,PO3, PO4,PO7
	(OR)					
b	i. Explain the purpose of mix design ii. What are factors affecting the choice of mix design?	14	II	U R	D532.2	PO1,PO2,PO3, PO4,PO7
13. a	i. Explain fiber reinforced concrete. ii. What are the applications of shotcrete concrete?	14	III	U R	D532.3	PO1,PO2,PO3, PO4,PO7
	(OR)					
b	i. What are the characteristics of light weight concrete ii. Explain the advantages of light weight concrete	14	III	R U	D532.3	PO1,PO2,PO3, PO4,PO7
14. a	i. What are the remedial measures in pre stressed concrete? ii. Explain pre tensioning and post tensioning methods.	14	IV	R U	D532.4	PO1,PO2,PO3, PO4,PO7
	(OR)					
b	i. What are the requirements of form work? ii. What are the points to be considered before placing the concrete in form work?	14	IV	R R	D532.4	PO1,PO2,PO3, PO4,PO7
15. a	i. Explain the types of cracks in concrete structures. ii. What are the preventive measures of cracks in concrete structures?	14	V	U R	D532.5	PO1,PO2,PO3, PO4,PO7
	(OR)					
b	i. Explain the necessity of construction joints and contraction joints. ii. What are the methods of repairing concrete?	14	V	U R	D532.5	PO1,PO2,PO3, PO4,PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as Presented below:

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

****

CED533 GEOTECHNICAL ENGINEERING

MODEL QUESTION PAPER

Note: Answer all questions. All questions carry equal marks

	PART- A				Marks 10X3=30
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**BLOOMS LEVEL**	**CO**	**PO**
1.	What are the factors affecting permeability?	I	R	D533.1	PO1,PO2
2.	Differentiate unit weight and density of soil.	I	U	D533.1	PO1,PO2,PO3
3.	State Mohr"s Columb failure theory.	II	R	D533.2	PO1,PO2
4.	What are the types of samples and samplers?	II	U	D533.2	PO1,PO2,PO3,PO4,
5.	Write any three properties of flow net.	III	R	D533.3	PO1,PO2
6.	Define bearing capacity of soil. Write the formula to find bearing capacity.	III	U	D533.3	PO1,PO2,PO3
7.	Explain about under reamed pile foundation with neat sketch.	IV	U	D533.4	PO1,PO2,PO3,PO4,
8.	Write the uses of pile foundation.	IV	R	D533.4	PO1,PO2,
9.	Define soil dynamic.	V	R	D533.5	PO1,PO2
10.	What is machine foundation?	V	R	D533.5	PO1,PO2
	PART- B				**Marks 5X14=70**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.					
11. a	i. Define: Liquidity index and Plasticity index. ii. Explain the liquid limit test on soil with neat sketch.	14	I	U R	D533.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. Explain how the plastic limit of soil is determined in the laboratory. ii. Explain in detail the factors affecting the permeability of soil	14	I	R R	D533.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
12. a	i. Compare compaction and consolidation of soil. ii. Explain with neat sketch the standard Proctor"s compaction test to determine the density of soil.	14	II	U R	D533.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						

b	i. Write short notes on disturbed and undisturbed soil samples ii. Explain with neat sketch any one type of geophysical method of soil exploration	14	II	R R	D533.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
13. a	i. State the different properties of flow nets. ii. Explain how the uplift pressure and exit gradient are calculated by using Khosla‟s theory	14	III	R R	D533.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. What are the factors affecting the bearing capacity of soil? ii What are the assumptions and limitations of Terzaghis analysis on bearing capacity of soil?	14	III	R R	D533.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
14. a	i. Explain with neat sketch the negative skin friction ii. Explain how the pile load test is carried out to determine the bearing capacity of piles.	14	IV	R R	D533.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. Explain how the expansive soils are identified ii. Explain with neat sketch about the under reamed pile foundation	14	IV	R R	D533.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
15. a	i. What are the general requirements for machine foundations? ii. Briefly describe the resonance method and wave velocity method for dynamic investigation of soil at the site	14	V	R R	D533.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. Give the necessary information required for the design and construction of transmission line tower foundation. ii. Explain how is the safety of a tower foundation checked against Uplift and overturning.	14	V	AN R	D533.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as Presented below:

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

DETAILLED SYLLABUS –VI SEMESTER

CED610 CONSTRUCTION MANAGEMENT

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous 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	NO.OF HOURS
I	Construction sector in India Feasibility study, planning of Civil Engineering Project and Contract Management	17
II	Construction Organisation and their Superintendence, Departmental procedure and Accounting	17
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 and Financial Management	17
	Tests & Model Exam	9
	Total	**96**

COURSE DESCRIPTION

This is an applied engineering subject. The subject aims at imparting basic knowledge about construction planning and management, site organization, 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 contractor ship, tendering and preparation of specifications for various types of jobs. Also diploma holders adopt values 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 OUTCOMES

Course	**CED610 CONSTRUCTION MANAGEMENT**
After successful completion of this course, the students should be able to	
D610.1	Understand the construction management functions, various organisation structures and duties of various construction teams.
D610.2	Understand the departmental procedures, accounting and M book entries.
D610.3	Develop the CPM and PERT network of various construction activities
D610.4	Understand the professional ethics and concern for safety during various construction works.
D610.5	Entrepreneurship and use management information system**.**

CED610 CONSTRUCTION MANAGEMENT

UNIT I **[17 Hrs]**

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. [2 Hrs]

Public and Private functions of construction management in national development - Construction practice:- the owner, consultant, and contractor - Duties and responsibilitie - Various stages of a construction project. [2 Hrs]

1.2 FEASIBILITY STUDY

Study of necessity of project– Technical feasibility, Financial feasibility, Ecological feasibility, Resource feasibility [1 Hr]

Recovery from the project, Economical Analysis –Building Economics – Preliminary studies-Analysis – valuation [2 Hrs]

1.3 PLANNING OF CIVIL ENGINEERING PROJECT

Objectives of planning – Public Project - Preliminary planning – Design factors – Site utilization- – Reconnaissance survey [2 Hrs]

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 clien and engineer [2 Hrs]

Limitations -Stages of planning by owner and contractor. [1 Hr]

1.4 CONTRACT MANAGEMENT

Types of contracts - Contract documents - Contractual obligations -Specifications - Tender notice [2 Hrs]

Types - Tender documents - Earnest money deposit (EMD) and Security deposits (SD) - Scrutiny and acceptance of a tender [2 Hrs]

Contract agreement – Contractual changes and termination of contract – Work order – Execution of agreement – Sub contract - Rights and duties of sub-contractor. [1 Hr]

UNIT II **[17 Hrs]**

2.1 CONSTRUCTION ORGANISATIONS AND THEIR SUPERINTENDENC

Forms of business organizations - sole proprietorship – Partnership - Joint stock company,- Co-operative society,- and State enterprises- Advantages and Disadvantages [2 Hrs]

delegation of responsibility, personnel requirements and division of works – Decentralization - Construction supervision and Superintendence [2 Hrs]

Requirements and Responsibilities of Executives of the project – Qualities of Efficient construction Manager [1 Hr]

Pay rolls and Records - Purchase and delivery of construction materials and equipments - Percentage completion report - Insurance record [2 Hrs]

Project office requirement - Organisation chart of a small / medium / large construction company (broad outline only). [2 Hrs]

2.2 DEPARTMENTAL PROCEDURE AND ACCOUNTING

Organisation of P.W.D. - Responsibilities of officers - Accounting procedure (administrative sanctions, technical sanctions, payment of bills) [2 Hrs]

Imprest and Temporary accounts – Cash book - Works register [2 Hrs]

Accounting for consumable materials - Record for tools and plants – Importance of M-book and its entries [2 Hrs]

Work charged establishment – Nominal Muster Roll (N.M.R) – Daily Labour Reports (D.L.R) [2 Hrs]

UNIT III **[18 Hrs]**

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) [2 Hrs]

Network for projects management – Activity – Event – Dummies – Basic assumptions in creating a network – Rules for developing networks [2 Hrs]

Fulckerson's rule for numbering the events – Critical Path Method Critical and Subcritical paths [2 Hrs]

Critical and Non critical activities/events – Significance of critical path – Simple Problems [2 Hrs]

PERT – Time estimate – EST, EFT, LST, LFT - Earliest expected time – Latest allowable occurrence time –Floats - Slack. Standard deviation - Variance – Simple problems. [2 Hrs]

3.2 RESOURCE MANAGEMENT

Definition – Need for resource management – Optimum utilization of resources- finance, materials, machinery, human resources [2 Hrs]

Resource planning – Resource levelling and its objectives – Construction planning – Stages – Operations [2 Hrs]

Schedule –Crashing – Need for crashing an activity – Methods and tips for crashing – Time Vs Cost optimization curve [2 Hrs]

Cost slope and its significance in crashing – simple problem on resource levelling (description only) [2 Hrs]

UNIT IV **[18 Hrs]**

4.1 QUALITY MANAGEMENT AND SAFETY

Importance of quality – Elements of quality – Quality assurance techniques (inspection, testing, sampling) Importance of safety [2 Hrs]

Causes of accidents – Role of various parties (designer / employer / worker) in safety management – Benefits [2 Hrs]

Approaches to improve safety in construction. [2 Hrs]

4.2 CONSTRUCTION DISPUTES AND THEIR SETTLEMENT [2 Hrs]

Introduction – Development of disputes – Categories of disputes [2 Hrs]

Modes of settlements -Arbitration. [2 Hrs]

4.3 CONSTRUCTION LABOUR AND LEGISTATION [2 Hrs]

Need for legislation - Payment of wages Act - Factories Act [2 Hrs]

Contract labour(Regulation and abolition) Act – Employees Provident Fund (EPF) Act

4.4 ETHICS IN ENGINEERING

Human values - Definition of Ethics - Engineering ethics - Engineering as a profession - Qualities of professional [2 Hrs]

Professional institutions - Code of ethics - Major ethical issues - Ethical judgment - Engineering and management decision Value based ethics. [2 Hrs]

UNIT - V **[17 Hrs]**

5.1 ENTREPRENEURSHIP

Definition – Role and Significance – Risks and Rewards – Concepts of Entrepreneurship [2 Hrs]

Profile and requirement of entrepreneur - Programmes existing in India – SISI, DIC, TANSIDCO [2 Hrs]

Funding and technical assistance to Entrepreneurship- NIDCO,ICICI,IDBI,IFCI, SFC. [2 Hrs]

5.2 INFORMATION MANAGEMENT AND COMPUTERS

Introduction – Definition of MIS – Out lines of MIS – Use of computers in construction industry – Requirements of MIS [2 Hrs]

A data base approach – Definition –Benefits - A data base approach to contractor account and its advantage – Basic concepts of estimation [2 Hrs]

Project management and operations simulation packages – Construction automation and Robotics. [2 Hrs]

5.3 FINANCIAL MANAGEMENT

Elements of cash flow – Time value of money – Interest rate of capital – Present value computation [2 Hrs]

NPV method – IRR method – simple problems - Global banking culture – Types of banks –Activities of Banks – Corporate finance [2 Hrs]

Personal, retail and rural banking – Treasury management. [1 Hr]

Tests & Model Exam **[9 Hrs]**

TEXT BOOKS:

Sl.No	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Construction of Structures and Management of works	Rangwala.S.C	Charotar Publishing House, Anand 388001, 2000
2.	Project Planning and control with PERT and CPM	B C Punmia	Lakshmi Publication 2010
3.	Construction Engineering & Management	Seetharaman. S	Umesh Publications NaiSarak, New Delhi 2006

REFERENCE BOOKS:

Sl.No	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Construction Management	Sanga Reddy. S	Kumaran Publications, Coimbatore
2.	Construction of Structures and Management of Works	Rangwala.S.C	Charotar Publishing House, Anand 388 001, 2000
3.	Planning , control PERT,CPM	B C Punmia	Laxmi Publications

LEARNING WEBSITES

1. https://nptel.ac.in/courses/105/103/105103093
2. https://nptel.ac.in/courses/105/104/105104161
3. https://youtu.be/pwv1Nu3TO4A
4. https://youtu.be/pwv1Nu3TO4A
5. Civil Engineering (Web Course), IIT Guwahati (nptel.ac.in)

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Assignment	-5 marks
Tests	-10 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D610.1	3	3	2	3	2	-	3	3	3	3
D610.2	3	3	2	3	2	-	3	3	3	3
D610.3	3	3	2	3	2	-	3	3	3	3
D610.4	3	3	2	3	2	-	3	3	3	3
D610.5	3	3	2	3	2	-	3	3	3	3
D610 Total	15	15	10	15	10	-	15	15	15	15
Correlation level	3	3	2	3	2	-	3	3	3	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED620 ESTIMATION, COSTING AND VALUATION

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
ESTIMATION, COSTING AND VALUATION	**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	NO.OF HOUURS
I	Introduction, Approximate Estimates, Measurements and Material Requirement and Specification & report writing	15
II	Preparation of Data and Rate Analysis	16
III	Detailed Estimate : Taking of quantities by Trade System	18
IV	Detailed Estimate : Taking of quantities by Group System	20
V	Report Writing, Valuation and Rent Calculation	18
	Tests & Model Exam	9
TOTAL		**96**

COURSE DESCRIPTION:

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 OUTCOMES:

Course	**CED620 ESTIMATION,COSTING AND VALUATION**
After successful completion of this course, the students should be able to	
D620.1	Understand the specifications for various materials and for different items of works and practice report writing
D620.2	Learn to Compute the rate analysis of various structures
D620.3	Analyze the trade system of buildings.
D620.4	Analyze the group system of buildings.
D620.5	Understand the procedure for report writing and valuation, rent calculation

CED620 ESTIMATION, COSTING AND VALUATION

UNIT I **[15Hrs]**

1.1INTRODUCTION:

Estimation – Definition of Estimate – Approximate estimate – Detailed estimate – Main estimate-Revised estimate [2 Hrs]

Supplementary estimate – Sub estimate – Annual maintenance estimate – Repair estimate – Complete estimate. [1 Hr]

1.2 APPROXIMATE ESTIMATES:

Necessity – Types – Plinth area method – Cubical content method – Service unit method [2 Hrs]

Typical bay method – Simple problems on preliminary estimate of a building project. [2 Hrs]

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 [2 Hrs]

Painting co- efficient – out turn of works working out of materials requirements – cement, sand, bricks, aggregates etc based on thumb rules for different works. [2 Hrs]

1.4 SPECIFICATION

Specification – Necessity – Types of specifications – Essential requirements of specifications – Specifications for various materials like Cement, Sand, Brick, Timber, Reinforcement Steel, Stone Aggregate, Water - Specifications for various [2 Hrs]

items of works – General Specifications for a building - Culvert - Concrete Roads - Detailed specifications for works such as, earthwork excavation, foundation concrete, Reinforcement cement concrete in column, beam and slab - Weathering course - Steps involved in writing standard specifications [2 Hrs]

UNIT II **[16Hrs]**

2.1 PREPARATION OFDATA

Data – Types – Main and sub data – Observed data [2 Hrs]

lead statement - Schedule of rates – Standard data book – Sundries – Lump sum provision [2 Hrs]

Preparation of data using standard data and schedule of rates: [2 Hrs]

2.2 RATE ANALYSIS:

Brick and stone masonry –Plain cement concrete in foundation– cement concrete Flooring works and weathering course [2 Hrs]

R.C. works for slab, sunshade, beam and column – Partition wall – Form works for beams and slabs – [2 Hrs]

Road works, WBM and surface dressing – White washing and painting works – A.C. sheet roofing [2 Hrs]

Apron and revetment works in canals – Wall plastering – Ceiling plastering [2 Hrs]

Pointing – Plumbing and sanitary works in buildings. [2 Hrs]

UNIT III **[19Hrs]**

3.1 TRADE SYSTEM:

Taking off Quantities –Systems – Trade system – Group system — Methods [2 Hrs]

Long wall and Short wall method – Centre line method – Preparation of data — Lump sum provision and contingencies [2 Hrs]

Quantity surveyor – Duties – Essential Qualities. [2 Hrs]

3.2 TAKING OFF QUANTITIES USING TRADE SYSTEM:

Prepare detailed estimate using Trade system and Take off quantities for all items of works in the following types of buildings: [2 Hrs]

i. A small residential building with two / three rooms with RCC roof.

ii. Two Storied building (framed structure) with RCC roof [2 Hrs]

iii. Industrial buildings with AC/GI sheet roof with steel trusses. [2 Hrs]

iv. Community Hall with columns and T-beams [2 Hrs]

v. Septic tanks with dispersion trench / soak pit [2 Hrs]

vi. R.C.C slab culvert [2 Hrs]

vii water bound macadam road [1 Hr]

UNIT IV **[19Hrs]**

4.1 GROUP SYSTEM:

Advantages of group system – Taking off and Recording Dimensions [2 Hrs]

Squaring Dimensions – Abstracting or Working up – Billing – Abbreviations. [2 Hrs]

Dimension paper – Timesing, Dimension, Squaring, Descriptive column – Cancellation of Dimensions – Descriptions – [2 Hrs]

– Spacing of Dimensions – Order of taking off – Squaring the Dimensions - Method of [2 Hrs]

Squaring – Checking the Squaring – Casting up the dimensions. [2 Hrs]

Function of the Abstract – Order in the Abstract – Preparing the abstract – Casting and reducing the Abstract [2 Hrs]

Method of writing Bill – Checking the Bill. [1 Hr]

4.2 TAKING OFFQUANTITIES USING GROUP SYSTEM:

Prepare detailed estimate using Group system and Take off quantities for all items of works in the following types of buildings: [2 Hrs]

i. A single roomed building using Group system [2 Hrs]

ii. A small residential building with two/three rooms with RCC roof. [2 Hrs]

UNIT V [**18Hrs**]

5.1 REPORT WRITING

Report writing – Points to be considered while writing a report – writing typical reports for works such as [2 Hrs]

i. Buildings – Residential / Hospital / School

ii. Laying a village road

iii. Construction of a bridge [2 Hrs]

iv. Water supply system for a village

5.1 VALUATION

Purpose of valuation – Types [2 Hrs]

Book value – Market value – Salvage value – Scrap value [2 Hrs]

Depreciation – Obsolescence – Sinking fund – Land valuation – Mortgage & Lease [2 Hrs]

Problems on valuation – Annuity – Definition & types only. [2 Hrs]

5.2 RENTCALCULATION

Fixation of rent – Outgoing – Gross & Net income [2 Hrs]

Years' Purchase – Capital cost – Standard rent [2 Hrs]

Market rent – Economical rent [1 Hr]

Problems on rent calculation. [1 Hr]

Tests & Model Exam [9 Hrs]

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Estimating & Costing	Rangawala	Charotor Publishing 2010
2.	Quantity Surveying & Valuation	N.A.Shaw	Khanna Publishers 2008
3.	Estimating & Costing	L.N.Dutta	DhanpatRai& Sons 2010

REFERENCE BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Estimating &Costing	Bridie	Kalson Publication Ludhiuyana.
2.	Casting and Valuation	Bridie	Kalson Publication Ludhiuyana.
3.	Civil Estimating	Bridie	Kalson Publication Ludhiuyana.

LEARNING WEBSITES

1. Civil Engineering (Web Course), IIT Guwahati (nptel.ac.in)
2. https://nptel.ac.in/content/storage2/courses/105103023/pdf/mod5.pdf
3. https://www.bing.com/search?q=estimation+and+costing+and+valuation+nptel&qs=n&form=QBRE&sp
4. https://youtu.be/G0vaIPRePMk

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Assignment	-5 marks
Tests	-10 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D620.1	3	2	3	3	-	2	-	2	3	3
D620.2	3	2	3	3	-	2	-	2	3	3
D620.3	3	2	3	3	-	2	-	2	3	3
D620.4	3	2	3	3	-	2	-	2	3	3
D620.5	3	2	3	3	-	2	-	2	3	3
D620 Total	15	10	15	15	-	10	-	10	15	15
Correlation level	3	2	3	3	-	2	-	2	3	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED631 SUSTAINABLE AND GREEN BUILDINGTECHNOLOGY

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
SUSTAINABLE AND GREEN BUILDING TECHNOLOGY	**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	NO.OF HOURS
I	Introduction to Green Building and Design Features	14
II	Energy Audit and Environmental Impact Assessment (EIA)	15
III	Energy and Energy conservation	14
IV	Principles and planning of Green building	14
V	Rating System	14
	Tests & Model Exam	9
TOTAL		**80**

COURSE DESCRIPTION

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 OUTCOMES:

Course	**CED631 SUSTAINABLE AND GREEN BUILDING TECHNOLOGY**
After successful completion of this course, the students should be able to:	
D631.1	Understand the Green Building, Benefits of Green Building
D631.2	Define Process, Benefits of EIA and Steps in environmental impact assessment
D631.3	Define the Renewable Energy Resources and non Renewable Energy Resources
D631.4	Understand the environmental quality in civil structure Materials and Reuse of waste
D631.5	Define the HVAC and what are all the councils involved.

CED631 SUSTAINABLE AND GREEN BUILDING TECHNOLOGY

UNIT I **[14 Hrs]**

1.1 INTRODUCTION TO GREEN BUILDING AND DESIGN FEATURES [2 Hrs]

Definition of Green Building, Benefits of Green Building, Components/ features [2 Hrs]

Green Building, Site selection, Energy Efficiency, Water efficiency, Material [2 Hrs]

Efficiency, Indoor Air Quality building form, orientation, building envelope and [2 Hrs]

Fenestration, material and construction techniques, roofs, walls, [2 Hrs]

fenestration and shaded finishes. [2 Hrs]

advanced passive heating and cooling techniques, waste reduction during construction. [2 Hrs]

UNIT II **[15 Hrs]**

2.1ENERGY AUDIT AND ENVIRONMENTAL IMPACT ASSESSMENT (EIA) [2 Hrs]

Meaning, Necessity, Procedures, Types, [1 Hr]

Energy Management Programs. [2 Hrs]

2.2 ENVIRONMENTAL IMPACT ASSESSMENT(EIA): [2 Hrs]

Introduction, EIA regulations

Steps in environmental impact assessment [2 Hrs]

Process, Benefits of EIA [2 Hrs]

Limitations of EIA [2 Hrs]

Environmental clearance for civil engineering projects. [2 Hrs]

UNIT-III **[14 Hrs]**

3.1ENERGY AND ENERGY CONSERVATION [2 Hrs]

Renewable Energy Resources: Solar Energy, Wind Energy, Ocean Energy,

Hydro Energy, Biomass Energy. [1 Hr]

Coal, Petroleum, Natural Gas, Nuclear Energy, Chemical Sources of Energy, [2 Hrs]

Fuel Cells, Hydrogen, Bio fuels [1 Hr]

3.2 ENERGY CONSERVATION [2 Hrs]

Introduction, Specific objectives, present scenario, Need of energy conservation,

LEED India Rating System and Energy [2 Hrs]

Energy-saving houses, Green House, Passive house, Passive house construction, [2 Hrs]

Low-energy house, Zero-energy house, Energy consulting, Energy efficiency. [2 Hrs]

UNIT-4 **[15 Hrs]**

4.1PRINCIPLES AND PLANNING OF GREEN BUILDING [2 Hrs]

Salient features of Green Building,

Environmental design (ED) strategies for building construction [2 Hrs]

Process Improvement in environmental quality in civil structure Materials: [2 Hrs]

Green building materials and products- Bamboo, [1 Hr]

Rice husk ash concrete, plastic bricks, Bagasse particle board, Insulated concrete forms [2 Hrs]

waste material-Plastic, rubber, Newspaper wood, Nontoxic paint, Green roofing. [2 Hrs]

building and construction safety, energy efficiency in housing, [2 Hrs]

Property Refurbishment / Upgrade / Modernization / Renovation - Modular kitchens, bathrooms, [2 Hrs]

UNIT-V **[14Hrs]**

5.1RATING SYSTEM

Introduction to (LEED) criteria, Indian Green Building council (IGBC) Green rating, [2 Hrs]

Green Rating for Integrated

Habitat Assessment. (GRIHA) criteria Heating Ventilation Air Conditioning. [2 Hrs]

(HVAC) unit in green Building Functions of Government organization working [2 Hrs]

Energy conservation and Audit(ECA) - National Productivity council(NPC) [2 Hrs]

Ministry of New and Renewable *Energy* (MNRE) Bureau of Energy efficiency [2 Hrs]

(BEE) -BER (Building Energy Rating) - Certificates – Plumbing and Electrical [2 Hrs]

Heating efficiency. [2 Hrs]

Tests & Model Exam **[9 Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER&EDITION
1.	Limit State Design in Structural Steel	M.R.Shiyekar	PHI Learning Pvt ltd 2011
2.	Sustainable construction: Green Building design and Delivery	Kibert, C.J., , John Wiley Hobouken	NewJersey.
3.	Energy Technology	O.P. Gupta	Khanna Publishing House, NewDelhi

REFERENCE BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER&EDITION
1.	Energy Management and Conservation	Sharma K V, Venkataseshaia	IK International.
2.	Green Building - Project Planning and Cost Estimating	Means R S	John Wiley &Sons
3.	Non-conventional Energy Resources	Shobh Nath Singh	New Age International Publishers, NewDelhi.

LERANING WEBSITES:

1. https://www.technicalbookspdf.com/green-bim-successful-sustainable-design-with-building-information-modeling-by-eddy-krygiel-and-brad-nies-and-steve-mcdowell/
2. https://www.bing.com/search?q=sustainable+and+green+building+technology+nptel&qs=n&form=QBRE
3. https://youtu.be/2Bh5NZSdsfw

CONTINUOUS INTERNAL ASSESSMENT:

Attendance	-5 marks
Assignment	-5 marks
Tests	-10 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D631.1	3	2	2	-	3	2	3	3	2	-
D631.2	3	2	2	-	3	2	3	3	2	-
D631.3	3	2	2	-	3	2	3	3	2	-
D631.4	3	2	2	-	3	2	3	3	2	-
D631.5	3	2	2	-	3	2	3	3	2	-
D631 Total	15	10	10	-	15	10	15	15	10	-
Correlation level	3	2	2	-	3	2	3	3	2	-

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED632 URBAN PLANNING AND DEVELOPMENT

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examination			
			Assessment Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
URBAN PLANNING AND DEVELOPMENT	**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	NO.OF HOURS
I	Town planning Principles, Surveys and Zoning	14
II	Housing and Slums	14
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
	Tests & Model Exam	9
	Total	**80**

COURSE DESCRIPTION:

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 student will be familiar:

- 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 OUTCOMES:

Course	**CED632 URBAN PLANNING AND DEVELOPMENT**
After successful completion of this course, the students should be able to	
D632.1	Understand the principles of town planning and zoning.
D632.2	Analyse the housing and the slum clearance project, to prepare plan for plot map cost flow.
D632.3	Understand the planning to the public buildings, as per the law and rules and regulations.
D632.4	Design urban roads and practice the traffic management.
D632.5	To know the approval of house building is to be base on the national policies and state level laws.

CED632 URBAN PLANNING AND DEVELOPMENT

UNIT I **[14 Hrs]**

1.1 TOWN PLANNING PRINCIPLES

General- Evaluation of planning – objects of Town planning - Economic justification for town planning- [2 Hrs]

Principles of Town planning Necessity of town planning Origin of towns - growth of towns - stages in towns development [2 Hrs]

Personality of town - Distribution of land - Forms of planning site for an ideal town Requirements of new towns [2 Hrs]

planning of modern town powers required for enforcement of town- planning scheme-cost to town planning- present position of town planning in India [2 Hrs]

1.2 SURVEYS

General -Necessity - Collection of Data - Types of surveys for planning a new town – uses of surveys [2 Hrs]

1.3 ZONING

Meaning of the term - Uses of land, objects and Principles of Zoning - Advantages of Zoning - Importance of Zoning [2 Hrs]

Aspects of Zoning Transition Zone- economy of zoning Special Economic Zone (SEZ) - Zoning powers - Maps for Zoning. [2 Hrs]

UNIT II **[14Hrs]**

2.1 HOUSING

General - Importance of housing - Demand for houses [3 Hrs]

Building site requirements of residential building Classification of residential building [2 Hrs]

design of residential areas- rural housing Agencies for housing [2 Hrs]

Investment in Housing HUDCO – CIDCO - Housing problems in India [2 Hrs]

2.2 SLUMS

General - Causes of slums - Characteristics of slums - Effects of slums - Slum clearance - Problems in removing slums [3 Hrs]

Improvement Works- Open plot scheme - Slum clearance end rehousing - Prevention of slum formation –Resources for slum clearance programs - The Indian slums. [2 Hrs]

UNIT III **[15Hrs]**

3.1 PUBLIC BUILDINGS

General – Suitable Location of Public Buildings – Classification of Public Buildings Principles of design of public buildings [2 Hrs]

Town centers - Grouping of public buildings – Requirements of Public buildings – Green House– Civic aesthetics. [2 Hrs]

3.2 PARKS AND PLAY GROUNDS

General- Types of recreation- Necessity of open spaces -Location of urban green spaces - [2 Hrs]

Classification of parks - Park systems [1 Hr]

park design- finance of parks- parkways Playgrounds - Space standards - Landscape architecture [2 Hrs]

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 [2 Hrs]

3.4 RE-PLANNING EXISTING TOWNS

General – Objects of re planning- Analysing the defects of existing towns- data to be collected- difficulties in master planning existing towns / cities urban renewal projects- merging of suburban areas Decentralization [2 Hrs]

Satellite towns- – Smart cities- definition and features-Surface drains- Refuses of town- Refuse disposal refuse disposal methods [2 Hrs]

UNIT - IV **14Hrs**

4.1 URBAN ROADS

General-Objects – Requirements of good city road- Factors to be considered- Classification of urban roads [2 Hrs]

Types of street system- Through and bye pass roads- outer and inner ring roads- Expressways- Freeways- Precincts- Road aesthetics [2 Hrs]

4.2TRAFFIC MANAGEMENT

General – Object – survey- Traffic congestion- Traffic control- Traffic diversion- Road junction- Parking- Traffic capacity of road [2 Hrs]

One way traffic - Road traffic problems Use of islands and flyovers at crossings [2 Hrs]

causes of road accidents- traffic signals [2 Hrs]

Advantages and disadvantages of automatic light signals- Road sign- Road marking- Name boards of street [2 Hrs]

Direction Boards- Street lighting in a town- Traffic problems of existing towns- Peculiarities of traffic [2 Hrs]

UNIT - V **[14Hrs]**

5.1 BUILDING BYE – LAWS

General -Objects of bye-laws- Importance of bye laws – Function of local authority – Responsibility of owners- Applicability of bye-laws- [2 Hrs]

Set backs- to buildings – Necessity of setbacks-Light plane - Plot coverage- Plot size- Floor Space index- Maximum Height of buildings- Off street parking [2 Hrs]

Fire protection- Minimum width of streets and some other terms -Principles underlying in framing building bye laws [2 Hrs]

Building Bye Laws for residential area- Town planning scheme- Building bye laws of other type of buildings – Development control rules – general rules of metropolitan Area- CMDA rules. [2 Hrs]

5.2 MISCELLANEOUS TOPICS [2 Hrs]

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- [2 Hrs]

Location for water/sewage treatment plants, location for waste disposal etc.,– Transportation planning. [2 Hrs]

Tests & Model Exam **[9Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Town Planning	S.C. Rangwala	Charotar Publisher 2011
2.	Town Planning	K.S.Rangwala and P.S.Rangwala	Charotar Publishing House, 15th Edition1999
3.	Remote sensing methods and application	Michael Hord, R	John Wiley and Sons New York 1986

REFERENCE BOOKS

SI.NO	TITLE	AUTHOR	PUBLISHER &EDITION
1.	Urban and regional planning	KA. Ramegowda	University of Mysore
2.	Principles and practice of town and country planning	Lewis B.Keeble,Estates Gazette	University of Michigan, 2010

LEARNING WEBSITES:

1. point (nptel.ac.in)
2. https://www.bing.com/search?q=urban+planning+and+development+nptel&qs=n&form=QBRE&sp=-
3. https://pdfs.semanticscholar.org/5dd5/a60cf8650775acdfb8b0a82621d366f5a8cc.pdf
4. https://youtu.be/YL_FOI2wuUs
5. https://youtu.be/q_XmlG3CwNk

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Assignment	-5 marks
Tests	-10 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D632.1	2	2	3	3	3	2	3	2	2	3
D632.2	2	2	3	3	3	2	3	2	2	3
D632.3	2	2	3	3	3	2	3	2	2	3
D632.4	2	2	3	3	3	2	3	2	2	3
D632.5	2	2	3	3	3	2	3	2	2	3
Total	10	10	15	15	15	10	15	10	10	15
Correlation level	2	2	3	3	3	2	3	2	2	3

Correlation level 1 – Slight(low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED633 WATER RESOURCES ENGINEERING

TEACHINGAND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
	Hours / Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
WATER RESOURCES ENGINEERING	**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	NO.OF HOURS
I	Introduction and Hydrology	14
II	Ground Water and Management of Ground Water	14
III	Rivers and River Training Works, Storage Works	15
IV	Distribution Works and Management of Canal Irrigation	14
V	Watershed Management and Water Harvesting and Recycling	14
	Tests & Model Exam	9
	TOTAL	**80**

COURSE DESCRIPTION:

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 resource management.
- Understand the components of hydrological cycle and hydrograph.
- Understand the occurrence of ground water and ground water exploration methods.
- Understand the groundwater 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 waterlogged lands.

COURSE OUTCOMES:

Course	**CED633 WATER RESOURCESE ENGINEERING**
After successful completion of this course, the students should be able to	
D633.1	Understand the Demonstrated ability to solve engineering design problems in the context of flood hydrology and hydrogeology.
D633.2	Identify the characteristics of ground water and their system management
D633.3	Understand the use of Canal Transmission Structures.
D633.4	Understand the plan and design of irrigation systems.
D633.5	Learn the water shed management and water harvesting system.

CED633 WATER RESOURCESE ENGINEERING

UNIT I **[14 Hrs]**

1.1 INTRODUCTION

Water resources – world water inventory - Importance o f water resources [2 Hrs]

Necessity for conservation and development of water resources–water resources of India-water resources management - purpose [2 Hrs]

water resources of India-water resources management - purpose – factors involved in water resources management. [2 Hrs]

1.2 HYDROLOGY [2 Hrs]

Introduction–Definition- Application of Hydrology in engineering - Hydrological cycle - Precipitation – [2 Hrs]

forms of Precipitation-measurements of rain fall - Rain gauge -types of rain gauges – rain gauge network [2 Hrs]

mean rainfall over a drainage basin –methods –Radar and Satellite Measurements of rainfall runoff – Estimation of runoff-losses –Hydrograph –Unit Hydrograph-uses [2 Hrs]

UNIT II **[14 Hrs]**

2.1 GROUNDWATER

Ground water resources- zones of Groundwater-Aquifer - types-terms used [2 Hrs]

porosity, permeability, yield, specific yield specific retention, coefficient of storage [2 Hrs]

specific capacity – Darcy's law-measurement of yield of well -pumping test [2 Hrs]

recuperation test-ground water exploration–geophysical methods- [2 Hrs]

Electrical resistivity method–seismic resistivity method-logs. [2 Hrs]

2.2 MANAGEMENT OF GROUNDWATER

Concept of basin management- Ground water basin investigations- data collection and field work-mining yield-perennial yield - [2 Hrs]

Salt balance - basin management by conjunctive use-artificial recharge of Groundwater-recharge methods. [2 Hrs]

UNIT-III- **[15 Hrs]**

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 [3 Hrs]

objectives of river training - classification of river training – methods of river training [2 Hrs]

Levees-guide banks–spurs–types-artificial cut-offs –launching apron-pitching of banks-pitched islands-miscellaneous methods. [2 Hrs]

3.2 STORAGE WORKS

Surface storage - purpose of surface storage – tanks – types -tank weirs – tank outlet [2 Hrs]

reservoirs – types - storage capacity of reservoir methods of determination of storage capacity of reservoir [2 Hrs]

reservoir losses – dams - classification of dams selection of dam site- Earth dams [2 Hrs]

types-methods of construction-causes of failure of earth dam- remedial measures Spillway- types – spill way crest gates-types – sluiceway -types. [2 Hrs]

UNIT-IV **14 Hrs**

4.1 DISTRIBUTION WORKS

Irrigation Canal - Typical cross section of canal - components of canal section [2 Hrs]

classification of canal -alignment of canal –canal head works – types [2 Hrs]

Components of diversion head works-cross drainage works – types - canal losses - [2 Hrs]

lining of canal –necessity-types of lining.

4.2 MANAGEMENT OF CANAL IRRIGATION

Canal irrigation system - Need for canal irrigation management
objectives of canal irrigation management - methods of improving canal irrigation management [2 Hrs]

cropping pattern - need for crop rotation-crop water requirement [2 Hrs]

-water delivery system-irrigation scheduling -frequency of irrigation - [2 Hrs]

optimum use of irrigation water-irrigation efficiencies-conservation of water on the field-farmer's participation-irrigation manager [2 Hrs]

UNIT-V

5.1 WATER SHED MANAGEMENT **[14 Hrs]**

Water shed - classification of water sheds - integrated approach for water shed management [2 Hrs]

role of remote sensing and GIS in water shed management-soil and water conservation [2 Hrs]

–Necessity - soil erosion – causes - effects – remedial measures against erosion-cont our bunding [2 Hrs]

strip cropping-bench terracing – check dams - vegetated water way [2 Hrs]

afforestation –crop residue-land drainage-surface drains-subsurface drains. [1Hr]

5.2 WATER HARVESTING AND RECYCLING [2 Hrs]

water harvesting-runoff collection-onsite detention basin-ponds

-types-Seepage control–methods -evaporation control- [1 Hr]

Recycling of harvested water - waste water recharge for reuse – methods -water [2 Hrs]

logging-remedial measures-soil reclamation.

Tests &Model Exam **[9 Hrs]**

TEXT BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Hydrology and water resources engineering	Santhosh Kumar Garg,	Khanna Publishsers-Delhi 2006
2.	Irrigation and Water Resources Engineering	G.L.Asawa	New Age International Pvt. Ltd New Delhi 2010
3.	Ground water Hydrology	David Keith	John Wiley & Sons Singapore 2009

REFERENCE BOOKS:

SI.NO	TITLE	AUTHOR	PUBLISHER & EDITION
1.	Irrigation water management	Dilip Kumar Majumdar	PHI Pvt., Ltd New Delhi 2011
2.	Irrigation and water power	Madan Mohan Das	PHI Learning Pvt., Ltd New Delhi 2011

LEARNING WEBSITES:

1. 3(nptel.ac.in)https://www.bing.com/search?q=water+resources+engineering+nptel&qs=n&form=QBRE&sp=-
2. https://repositorio.cepal.org/bitstream/handle/11362/39542/1/FOCUSIssue4Oct-Dec2015.pdf
3. https://youtu.be/fx1uUek3Iqg

CONTINUOUS INTERNAL ASSESSMENT

Attendance	-5 marks
Assignment	-5 marks
Tests	-10 marks
Seminar	-5 marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D633.1	2	2	3	3	3	2	3	2	2	3
D633.2	2	2	3	3	3	2	3	2	2	3
D633.3	2	2	3	3	3	2	3	2	2	3
D633.4	2	2	3	3	3	2	3	2	2	3
D633.5	2	2	3	3	3	2	3	2	2	3
D633 Total	10	10	15	15	15	10	15	10	10	15
Correlation level	2	2	3	3	3	2	3	2	2	3

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

QUESTION PAPER SETTING

The teaching learning process and assessment are being carried out in accordance with the revised Bloom's Taxonomy. The question paper should consist of 90% questions based on Lower Order Thinking (LOTs) and the remaining 10% based on Higher Order Thinking (HOTs) as detailed below.

Bloom's Taxonomy	**Lower Order Thinking Skills (LOTs)**	**Higher Order Thinking Skills (HOTs)**
Level	R-Remember, U-Understand, Ap-Apply	An-Analyse, E-Evaluate, C- Create
% to be included	90%	10%

CED640 COMPUTER APPLICATIONS IN CIVIL ENGINEERING PRACTICE

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
COMPUTER APPLICATIONS IN CIVIL ENGINEERING PRACTICE	**5 Hrs.**	**80Hrs.**	**25**	**75***	**100**	**3 Hrs.**

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

DETAILED ALLOCATION OF MARKS

SI.No	Description	Part - A Max.Marks(40)	Part - B Max.Marks(45)
1.	Procedure	5	5
2	Tabulation and Observation	15	20
3	Calculations	10	10
4	Sketch / Graph	5	5
5	Accuracy of result	5	5
6.	Mini Project	10	
7.	Viva Voce	5	
	Total	**100**	

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

EQUIPMENTS REQUIRED:

SI.No.	Name 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

OBJECTIVES:

- All the experiments given in the list of experiments should be completed and given for the end semester practical examination.
- In order to develop best skills in handling Instruments/Equipment and taking readings in the practical classes, every two students should be provided with a separate experimental setup for doing experiments in the laboratory.
- The external examiners are requested to ensure that a single experimental question should not be given to more than four students while admitting a batch of 30 students during Board Examinations.

COURSE OUTCOMES:

Course	CED640 COMPUTER APPLICATIONS IN CIVIL ENGINEERING PRACTICE
After successful completion of this course, the students should be able to	
D640.1	Understand to create excel sheet of the estimation values
D640.2	Understand the available open source software tools used for specific Problems in Civil Engineering.
D640.3	Use the latest software tools for Modeling, Analysis and Design of Civil Engineering Systems
D640.4	Understand the of project management system of schedule building
D640.5	Understand the about map drawing with GIS software.

CED640 COMPUTER APPLICATIONS IN CIVIL ENGINEERING PRACTICE

PART A

I RCC DETAILING SOFTWARE

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 Total Amount 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 singly reinforced section
6. 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
7. Finding centre of gravity; IZZ and IYY of I, L,T and channel sections

Commercial Software	Similar Open source	Download Link
Microsoft Project	Open office	http://www.download.openoffice.org/
	Libre office	http://www.libreoffice.org/

PART B

II RCC DETAILING SOFTWARE

Generation of detailed drawings for the given specification and Preparation of Bar Bending schedule using any one of the software packages for the following exercises.

Cross section and longitudinal section of:

1. Continuous one way slab (with three equal Spans)
2. Simply supported two-way slabS
3. Restrained two – way slab
4. Singly reinforced rectangular beam
5. Doubly reinforced continuous rectangular beam with two equal span
6. Dog-legged staircase
7. R.C.C Column with square Isolated footing
8. Mini Project

   The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

III RCC STRUCTURES - ANALYSISUSINGSOFTWARE

1.Carry out of the analysis and design of RCC structures using any one of the available packages like STADD PRO,ETAB,CADD&3D any other suitable packages

IV CONSTRUCTION PROJECT MANAGEMENT USING SOFTWARE

1. 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.

Commercial Software	Similar Open source	Download Link
Microsoft Project	GANTT PROJECT	http://www.ganttproject.biz/

V DRAWING MAPS USING GIS SOFTWARE (Demonstration And Practice Only)

1. Develop Aerial map of given area using any one of the available packages mentioned below or any other suitable packages.

Commercial Software	Similar Open source	Download Link
ARCGIS	Q GIS	http://www.qgis.org/en/site/
	GRASS GIS	http://grass.osgeo.org/

LEARNING WEBSITES:

1. https://www.bing.com/search?q=rcc+structures+in+cad+pdf&qs=n&form=QBRE&sp=-
2. https://youtu.be/OaPWNOwbBnI

CONTINUOUS INTERNAL ASSESSMENT:

Attendance	- 5 marks
Procedure /observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D640.1	2	3	3	3	2	2	3	2	3	3
D640.2	2	3	3	3	2	2	3	2	3	3
D640.3	2	3	3	3	2	2	3	2	3	3
D640.4	2	3	3	3	2	2	3	2	3	3
D640.5	2	3	3	3	2	2	3	2	3	3
D640 Total	10	15	15	15	10	10	15	10	15	15
Correlation level	2	3	3	3	2	2	3	2	3	3

Correlation level 1 – Slight (low)

Correlation level 2 – Moderate (Medium)

Correlation level 3 – Substantial (high)

CED640 COMPUTER APPLICATIONS IN CIVIL ENGINEERING PRACTICE

Model Question Paper

Note: i). Answer all Questions part A; questions carries 40 marks part B; questions carries 45 marks			
		CO	**PO**
1. a	Using MS EXCEL, prepare the detailed estimate sheet with the given data and calculate the quantities for the following items of work using formula bar. i. Earthwork excavation in foundation ii. Cement concrete 1:5:10 in foundation iii. Brick work with C.M 1:6 using I class bricks in foundation and basement.	D640.1	PO1,PO2, PO3,PO4, PO7
b	Generate the following detailed drawings of a continuous one way slab (three equal spans) for the given particulars / specifications to a suitable scale using R.C.C detailing package. i. Cross-section of the slab along shorter span showing reinforcement details. ii. Cross-section of the slab along longer span showing reinforcement details. iii. Plan showing the reinforcement arrangements at bottom. iv. Bar bending schedule.	D640.3	PO1,PO2, PO3,PO4, PO7
2. a	Using MS EXCEL, prepare the abstract sheet with the given data and calculate the total amount for the following items of work using formula bar. i) Earthwork excavation in foundation. ii) Cement concrete 1:5:10 in foundation. iii) Brick work with C.M 1:6 using I class bricks in foundation and basement. iv) Sand filling in basement. v) RCC in lintels and sunshade. vi) Flooring concrete	D640.2	PO1,PO2, PO3,PO4, PO7
b	Carry out the analysis and design of RCC structures using any one available analysis and design software package. Note: 1. RCC structures may be a continuous beam (OR) plane frame with one or two stories and bays(OR) space frame with single bay and single storey to be given by the Examiners 2. Each candidate may be given with a separate structure with different dimensions and loading.	D640.3	PO1,PO2, PO3,PO4, PO7
3. a	Using MS EXCEL, calculate the area and elongation of a prismatic bar for the given load (P),length (l), breadth(b),thickness(t) and Young's modulus (E) using formula bar.	D640.1	PO1,PO2, PO3,PO4, PO7
b	Generate the following detailed drawings of a simply supported two way slab for the given particulars / specifications to a suitable scale using	D640.3	PO1,PO2, PO3,PO4,

	R.C.C detailing package. i. Cross-section of slab along shorter span showing reinforcement details. ii. Cross-section of slab along longer span showing reinforcement details. iii. Plan showing the reinforcement arrangements at bottom. iv. Bar bending schedule.		PO7
4. a	Using MS EXCEL, calculate the effective depth 'd' and area of steel 'Ast' for a singly reinforced rectangular beam for the given values of 'Mu','b', 'fck' and 'fy' using formula bar.	D640.1	PO1,PO2, PO3,PO4, PO7
b	Generate the following detailed drawings of a restrained two way slab for the given particulars / specifications to a suitable scale using R.C.C detailing Package. i. Cross-section of the slab along shorter span showing reinforcement details. ii. Cross-section of the slab along longer span showing reinforcement details. iii. Plan showing the reinforcement arrangements at bottom Bar bending schedule.	D640.4	PO1,PO2, PO3,PO4, PO7
5. a	Using MS EXCEL, calculate the base pressure and check the stability of the R.C.C dam for the given values of top width 'a', bottom width 'b' , height of dam 'H, height of water 'h', Specific weight of R.C.C 'γc' and specific weight of water 'γw' using formula bar.	D640.1	PO1,PO2, PO3,PO4, PO7
b	Generate the following drawings of a singly reinforced rectangular R.C.C beam for the given particulars / specifications to a suitable scale using R.C.C detailing package. i. Longitudinal section of the beam showing reinforcement details. ii. Cross-section of the beam at mid span and at support showing reinforcement details. iii. Bar bending schedule.	D640.3	PO1,PO2, PO3,PO4, PO7
6. a	Using MS EXCEL,find the centre of gravity, Ixx and Iyy for the given L section.	D640.1	PO1,PO2, PO3,PO4, PO7
b	Generate the following drawings of a doubly reinforced continuous rectangular R.C.C beam (two equal span) for the given particulars / specifications to a suitable scale using R.C.C detailing package. i. Longitudinal section of the beam showing the reinforcement details. ii. Cross section of the beam at mid span and at supports. iii. Bar bending schedule.	D640.3	PO1,PO2, PO3,PO4, PO7
7. a	Using MSEXCEL, find the centre of gravity, Ixx and Iyy for the given I section. (Section details to be given by the Examiners)	D640.1	PO1,PO2, PO3,PO4, PO7
b	Carry out the analysis and design of RCC structures using any one available analysis and design software package. Note: 1. RCC structures may be a continuous beam (OR) plane frame with one or two stories and bays(OR) space frame with single bay and single storey	D640.3	PO1,PO2, PO3,PO4, PO7

	2. Each candidate may be given with a separate structure with different dimensions and loading.		
8. a	Using MSEXCEL, find the centre of gravity, Ixx and Iyy for the given "T" section.	D640.1	PO1,PO2, PO3,PO4, PO7
b	Generate the following detailed drawings of a Dog-legged R.C.C stair case for the given particulars / specifications to a suitable scale using R.C.C detailing package. i. Longitudinal section of the waist slab showing reinforcement details. ii. Cross section of the waist slab.	D640.3	PO1,PO2, PO3,PO4, PO7
9. a	Using MSEXCEL, prepare the abstract sheet with the given data and calculate the total amount for the following items of work using formula bar. i. Earthwork excavation in foundation. ii. Cement concrete 1:5:10 in foundation. iii. Brick work with C.M 1:6 using I class bricks in foundation and basement.	D640.1	PO1,PO2, PO3,PO4, PO7
b	Generate the following detailed drawings of a R.C.C column with square isolated footing for the given particulars / specification to a suitable scale using R.C.C detailing package. i. Cross-section of Column and footing showing reinforcement details. ii. Plan showing the arrangements of reinforcement. iii. Bar bending schedule.	D640.4	PO1,PO2, PO3,PO4, PO7
10. a	Using MS EXCEL, prepare the abstract sheet with the given data and calculate the total amount for the following items of work using formula bar. i. Earthwork excavation in foundation. ii. Cement concrete 1:5:10 in foundation. iii. Brick work with C.M 1:6 using I class bricks in foundation and basement. iv. Sand filling in basement. v. RCC in lintels and sunshade. vi. vi. Flooring concrete	D640.4	PO1,PO2, PO3,PO4, PO7
b	Develop the CPM network chart for a proposed simple project using any one available project management software package. (Minimum seven tasks for the CPM network chart to be given)	D640.5	PO1,PO2, PO3,PO4, PO7
11. a	Using MSEXCEL, calculate the area and elongation of a prismatic bar for the given load (P),length (l), breadth(b),thickness(t) and Young"s modulus (E) using formula bar. (Suitable values to be given by the Examiners)	D640.1	PO1,PO2, PO3,PO4, PO7
b	Develop the PERT network chart for a proposed simple project using any one available project management software package. (minimum seven tasks with necessary details for the PERT network chart to be given)	D640.3	PO1,PO2, PO3,PO4, PO7
12. a	Using MSEXCEL, calculate the effective depth „d" and area of steel „Ast" for a singly reinforced rectangular beam for the given values of „Mu",„b", „fck" and „fy" using formula bar. (Suitable values to be given)	D640.1	PO1,PO2, PO3,PO4, PO7

b	Carry out the analysis and design of RCC structures using any one available analysis and design software package. Note: 1. RCC structures may be a continuous beam (OR) plane frame with one or Two stories and bays(OR) space frame with single bay and single storey to be given by the Examiners 2. Each candidate may be given with a separate structure with different dimensions and loading. 3. Details required for the generation of models and the results expected may be given.	D640.4	PO1,PO2, PO3,PO4, PO7
13. a	Using MSEXCEL, calculate the base pressure and check the stability of the R.C.C dam for the given values of top width „a", bottom width „b" , height of dam „H, height of water „h", Specific weight of R.C.C „γc„ and specific weight of water „γw„ using formula bar. (Suitable values to be given)	D640.1	PO1,PO2, PO3,PO4, PO7
b	Carry out the analysis and design of RCC structures using any one available analysis and design software package. Note: 1. RCC structures may be a continuous beam (OR) plane frame with one or two stories and bays (OR) space frame with single bay and single storey to be given. 2.Each candidate may be given with a separate structure with different Dimensions and loading. 3. Details required for the generation of models and the results expected may be given.	D640.3	PO1,PO2, PO3,PO4, PO7
14. a	Using MS EXCEL,find the centre of gravity, Ixx and Iyy for the given I section. (Section details to be given)	D640.1	PO1,PO2, PO3,PO4, PO7
b	Carry out the analysis and design of RCC structures using any one available analysis and design software package. Note: 1. RCC structures may be a continuous beam (OR) plane frame with one or two stories and bays (OR) space frame with single bay and single storey to be given. 2. Each candidate may be given with a separate structure with different dimensions and loading. 3. Details required for the generation of models and the results expected may be given.	D640.4	PO1,PO2, PO3,PO4, PO7
15. a	Using MS EXCEL,find the centre of gravity, Ixx and Iyy for the given I section. (Section details to be given)	D640.1	PO1,PO2, PO3,PO4, PO7
b	Develop the CPM network chart for a proposed simple project using any one available project management software package. (Minimum seven tasks with necessary details required for the CPM network chart to be given)	D640.4	PO1,PO2, PO3,PO4, PO7

16.a	Using MSEXCEL, find the centre of gravity, Ixx and Iyy for the given „T" section. (Section details to be given by the Examiners)	D640.1	PO1,PO2, PO3,PO4, PO7
b	Develop the PERT network chart for a proposed simple project using any one available project management software package (Minimum seven tasks with necessary details for the PERT network chart to be given)	D 640.4	PO1,PO2, PO3,PO4, PO7
17	Mini Project	D 640.5	PO1,PO2, PO3,PO4, PO7

CED651 ESTIMATION AND COSTING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 weeks

Course	Instructions		Examination			
	Hours / Week	Hours/ Semester	Marks			Duration
			Internal Assessment	Autonomous Examination	Total	
ESTIMATION AND COSTING LABORATORY	**4 Hrs**	**64 Hrs**	**25**	**75***	**100**	**3 Hrs.**

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

DETAILED ALLOCATION OF MARKS

SI. No	Description	Marks
1.	Tabulation and Observation	40
2.	Calculations	35
3.	Accuracy of result	10
4.	Mini Project	10
5.	Viva-Voce	5
	Total	**100**

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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 OUTCOMES:

Course	**CED651 ESTIMATION AND COSTING LABORATORY**
After successful completion of this course, the students should be able to:	
D651.1	Learn the various building structures
D651.2	Understand the estimation and recordings.
D651.3	Analyze the R.C.C and road structures.
D651.4	Understand the bar bending schedule
D651.5	Understand the footing design and to develop the mini projects with report.

CED651 ESTIMATION AND COSTING LABORATORY

LIST OF EXPERIMENTS

1. Prepare the list of items to be executed with units for detailed estimate of a given structure from the given drawing
2. 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.
3. Recording in Measurement Book (MB) for any four items.
4. Prepare bill of quantities of given item from actual measurements. (Any four items).
5. Prepare approximate estimate for the given engineering works
6. 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).
7. Prepare detailed estimate from the given set of drawings using "standard measurement and abstract format" for RCC framed structure using description of item (G+1Building)
8. Calculate the reinforcement quantities from the given set of drawings for a room size of 3 m x 4m with bar bending schedule.
9. Prepare detailed estimate of bitumen road of one kilometer length from the given drawing
10. Prepare detailed estimate of small Septic tank from the given set of drawings.
11. Prepare bar bending schedule for the given singly reinforced and doubly reinforced beams
12. Prepare bar bending schedule for the given continuous beam
13. Prepare bar bending schedule for the given one way slab
14. Prepare bar bending schedule for the given two way slab
15. Prepare bar bending schedule for the given square column and square footing
16. Prepare a Detailed Estimate for the given Staircase
17. Mini Project

    The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITE

1. https://civiconcepts.com/
2. https://youtu.be/lOUt8b-PzuU
3. https://youtu.be/XNEtSFMOpho

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure /observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D651.1	2	3	2	2	3	2	3	2	3	3
D651.2	2	3	2	2	3	2	3	2	3	3
D651.3	2	3	2	2	3	2	3	2	3	3
D651.4	2	3	2	2	3	2	3	2	3	3
D651.5	2	3	2	2	3	2	3	2	3	3
D651 Total	10	15	10	10	3	10	3	10	3	3
Correlation level	2	3	2	2	15	2	15	2	15	15

Correlation level 1 – Slight (low)

Correlation level 2 – Moderate (Medium)

Correlation level 3 – Substantial (high)

CED651 ESTIMATION AND COSTING LABORATORY

MODEL QUESTION PAPER

Answer All the questions and each questions carries 85 marks		CO	PO
1.	Prepare the list of items to be executed with units for detailed estimate of a given structure from the given drawing.	D651.1	PO1,PO2,PO3, PO4,PO7
2.	Record in Measurement Book (MB) for the given items of work.	D651.2	PO1,PO2,PO3, PO4,PO7
3.	Prepare bill of quantities of given four items of actual measurements of work.	D651.2	PO1,PO2,PO3, PO4,PO7
4.	Prepare approximate estimate for the given engineering works.	D651.2	PO1,PO2,PO3, PO4,PO7
5.	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).	D651.2	PO1,PO2,PO3, PO4,PO7
6.	Prepare detailed estimate from the given set of drawings using "standard measurement and abstract format" for RCC framed structure using the given description of item.	D651.2	PO1,PO2,PO3, PO4,PO7
7.	Calculate the reinforcement quantities from the given set of drawings for a room size of 3m x 4m with bar bending schedule.	D651.4	PO1,PO2,PO3, PO4,PO7
8.	Prepare detailed estimate of bitumen road of one kilometer length from the given drawing.	D651.3	PO1,PO2,PO3, PO4,PO7
9.	Prepare detailed estimate of small Septic tank from the given set of drawings.	D651.1	PO1,PO2,PO3, PO4,PO7
10.	Prepare detailed estimate of well from the given set of drawing.	D651.2	PO1,PO2,PO3, PO4,PO7
11.	Prepare bar bending schedule for the singly reinforced and doubly reinforced beams given in the sketch.	D651.4	PO1,PO2,PO3, PO4,PO7
12.	Prepare bar bending schedule for the continuous beam given in the sketch.	D651.4	PO1,PO2,PO3, PO4,PO7
13.	Prepare bar bending schedule for the one way slab and two way slab given in the sketch.	D651.4	PO1,PO2,PO3, PO4,PO7
14.	Prepare bar bending schedule for the square column and square footing given in the sketch.	D651.4	PO1,PO2,PO3, PO4,PO7
15.	Prepare the list of items to be executed with units for detailed estimate of a given structure from the given drawing.	D651.4	PO1,PO2,PO3, PO4,PO7
16.	Prepare a Detailed Estimate for the given Staircase	D651.4	PO1,PO2,PO3, PO4,PO7
17.	Mini Project	D651.5	PO1,PO2,PO3, PO4,PO7

CED652 - HIGHWAY ENGINEERING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous Examination	Total	
HIGHWAY 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.**

DETAILED ALLOCATION OF MARKS

SI.No	Description	Marks
1.	Procedure	15
2.	Tabulation and Observation	30
3.	Calculations	30
4.	Accuracy of result	10
6.	Mini Project	10
7.	Viva-Voce	5
	Total	**100**

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

In this course, the students learn about testing of aggregates, bitumen and preparing a report about road works.

EQUIPMENTS REQUIRED (for a batch of 30 students):

SI.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

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 OUTCOMES:

Course	**CED652 - HIGHWAY ENGINEERING LABORATORY**
After successful completion of this course, the students should be able to:	
D652.1	Know the Freeways, NH/SH,MDR/ODR
D652.2	Understand test of bitumen
D652.3	Study of dense Bituminous macadam design
D652.4	Understand the photographic report
D652.5	Understand the drainage condition and Develop the mini projects with report.

CED652 - HIGHWAY ENGINEERING LABORATORY

S.No	LIST OF EXPERIMENTS
1.	Draw the sketches showing standard cross sections of Expressways, Freeways, NH/SH,MDR/ODR
2.	Flakiness and Elongation Index of aggregates.
3.	Angularity Number of aggregates.
4.	Los Angeles Abrasion test
5.	Softening point test of bitumen.
6.	Penetration test of bitumen.
7.	Ductility test of Bitumen.
8.	Study of dense Bituminous macadam design
9.	Visit the constructed road for visual inspection to identify defects and suggest remedial measures.
10.	Prepare the photographic report containing details for exercise No.9
11.	Visit the hill road constructed site to understand its components.
12.	Prepare the photographic report containing details for exerciseNo.11
13.	Visit the road of any one type (flexible or rigid) to know the drainage condition.
14.	Mini Project The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES

1. Welcome to Virtual Labs - A MHRD Govt of india Initiative (vlabs.ac.in)
2. (PDF) Highway and Transportation Engineering Lab Manual | Jayashree Sengupta - Academia.edu
3. https://youtu.be/_tFwd253hG0

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure /observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D652.1	3	2	2	3	2	2	3	3	2	2
D652.2	3	2	2	3	2	2	3	3	2	2
D652.3	3	2	2	3	2	2	3	3	2	2
D652.4	3	2	2	3	2	2	3	3	2	2
D652.5	3	2	2	3	2	2	3	3	2	2
D652 Total	15	10	10	15	10	10	15	15	10	10
Correlation level	3	2	2	3	2	2	3	3	2	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED652 - HIGHWAY ENGINEERING LABORATORY

MODEL QUESTION PAPER

Answer all the questions and each question carries 85 marks		CO	PO
1.	Conduct the Flakiness and Elongation Index test on the given sample of aggregates and state the flakiness and elongation index.	D652.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
2.	Conduct the angularity test on the given sample and determine the Angularity Number of aggregate sample.	D652.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
3.	Conduct the Los Angeles Abrasion test on the given sample and find out the abrasion value of the given sample.	D652.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
4.	Conduct Softening point test of bitumen and determine the softening point of the given sample.	D652.3	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
5.	Conduct Penetration test of bitumen and find out the hardness or softness of the bitumen	D652.3	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
6.	Conduct Flash and Fire Point test of bitumen and state the lowest temperature at which the bitumen can be ignited. Also state the safe mixing and application temperature values of given bitumen sample.	D652.3	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
7.	Conduct Ductility test of Bitumen find the ductility value of the given sample	D652.3	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
8.	Mini Project	D652.5	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7

CED653 - WATER RESOURCES ENGINEERING LABORATORY

TEACHING AND SCHEME OF EXAMINATION

No. of Weeks Per Semester: 16 Weeks

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous 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.**

DETAILED ALLOCATION OF MARKS

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

Mini Project Evaluation (10 marks)

Breakup Details

1	Project Description	05
2	Project Demo	05
	Total	**10**

COURSE DESCRIPTION:

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.

EQUIPMENTS REQUIRED

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

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 OUTCOMES

Course	CED653 WATER RESOURCES ENGINEERING LABORATORY
After successful completion of this course, the students should be able to:	
D653.1	Understand the water demand of crops and provisions
D653.2	analyze the testing machine, briquette mould, water bath
D653.3	Understand the canal and reservoir
D653.4	Understand the model of any irrigation structure
D653.5	Know the one micro or minor irrigation scheme and develop the mini projects with report.

CED653 - WATER RESOURCES ENGINEERING LABORATORY

LIST OF EXPERIMENTS

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 irrigation scheme.
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 vicinity of your area, based on field visit.
13. Prepare summary of the technical details of any existing water resource project in the 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 of material required for lining.
16. Mini Project

    The mini project is activity based and it may be group of maximum of six students for handled experience and to create specific temper.

LEARNING WEBSITES

1. Rural Water Resources Management - Course (nptel.ac.in)
2. https://youtube.videoken.com/embed/qyfQem7KaRY
3. https://youtu.be/80WIZddUUyE
4. https://youtu.be/vDr1PiNhYz8

CONTINUOUS INTERNAL ASSESSMENT

Attendance	- 5 marks
Procedure /observation/output	
Other practical related works	- 5 marks
Tests	- 10 marks
Student Centered Learning (SCL) work sheet	- 5 Marks

Total	**- 25 marks**

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D653.1	3	2	3	3	3	2	3	3	2	2
D653.2	3	2	3	3	3	2	3	3	2	2
D653.3	3	2	3	3	3	2	3	3	2	2
D653.4	3	2	3	3	3	2	3	3	2	2
D653.5	3	2	3	3	3	2	3	3	2	2
D653 Total	15	10	15	15	15	10	15	15	10	10
Correlation level	3	2	3	3	3	2	3	3	2	2

Correlation level 1 – Slight (low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

CED653 - WATER RESOURCES ENGINEERING LABORATORY

MODEL QUESTION PAPER

Answer all the questions and each questions carries 85 marks		CO	PO
1.	Calculate average rainfall for the given area using arithmetic mean method.	D653.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
2.	Calculate average rainfall for the given area using isohyetal, Theissen polygon method.	D653.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
3.	Delineation of contributory area for the given outlet from the given topo-sheet.	D653.2	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
4.	Estimate crop water requirement for the given data.	D653.1	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
5.	Estimate capacity of the canal for the given data.	D653.3	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
6.	Calculate reservoir capacity from the given data.	D653.3	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
7.	Calculate control levels for the given data for a given reservoir.	D653.3	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
8.	Draw a labeled sketch of the given masonry/earthen dam section.	D653.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
9.	Draw the theoretical and practical profile of the given gravity dam section.	D653.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
10.	Prepare a presentation on the technical details of any one micro or minor irrigation scheme.	D653.5	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
11.	Prepare a model of any irrigation structure using suitable material.	D653.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
12.	Prepare a maintenance report for any major/minor irrigation project site in the vicinity of your area, based on field visit.	D653.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
13.	Prepare summary of the technical details of any existing water resource project in the vicinity of your area.	D653.5	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
14.	Draw a labeled sketch of the given diversion head works and Cross Drainage works.	D653.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
15.	Design a canal section for the given conditions with estimation of the quantity of material required for lining.	D653.4	PO1,PO2,PO3,PO4 ,PO5,PO6,PO7
16.	Mini Project	D653.5	PO1,PO2,PO3,PO4, PO5,PO6,PO7

CED660 PROJECT WORK AND INTERNSHIP

TEACHING AND SCHEME OF EXAMINATION

No. of weeks per semester: 16 WEEKS

Course	Instructions		Examination			
			Marks			Duration
	Hours / Week	Hours/ Semester	Internal Assessment	Autonomous 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.**

COURSE DESCRIPTION:

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:

i) 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.

ii) Develop understanding of subject based knowledge given in the classroom in the context of its application at work places.

iii) 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.

iv) 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 for 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.

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:

SI.No	Activity	Reference
1.	Preparation of Architectural Drawings	1. Building Regulations of Locality 2. National Building Code of India, etc
2.	Structural design, Concrete Reinforcement, Steel etc.	1. Relevant IS code for Masonry, Structures 2. IS 456 for Reinforced Cement Concrete 3. 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	1. Construction procedure by organization,viz. PWD 2. Construction procedure by organization viz. CPWD 3. 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) CONTINUOUS INTERNAL ASSESSMENT:

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

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

b) ALLOCATION OF MARKS FOR PROJECT WORK

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

COURSE OUTCOMES:

Course	**CED660 PROJECT WORK AND INTERNSHIP**
After successful completion of this course, the students should be able to:	
D660.1	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
D660.2	Get exposure on industrial environment and its work ethics
D660.3	Understand the theoretical and practical knowledge gained through the real practical working environment preferably in an industrial environment
D660.4	Understand the rules and regulation of buildings.
D660.5	Know the creativity of building structures.

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

CO-POs & PSOs MAPPING MATRIX

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
D660.1	3	3	3	3	3	3	3	3	3	3
D660.2	3	3	3	3	3	3	3	3	3	3
D660.3	3	3	3	3	3	3	3	3	3	3
D660.4	3	3	3	3	3	3	3	3	3	3
D660.5	3	3	3	3	3	3	3	3	3	3
D660 Total	15	15	15	15	15	15	15	15	15	15
Correlation level	3	3	3	3	3	3	3	3	3	3

Correlation level 1 – Slight(low)
Correlation level 2 – Moderate (Medium)
Correlation level 3 – Substantial (high)

LIST OF SUGGESTED PROJECTS

- **COMPARATIVE STUDY**

  Conventional and Composite concrete mixtures Light weight construction materials Prefabricated 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 flyash in concete

- **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
  - Baggase ash concrete
  - Flyash concrete
  - Concrete with Natural vegetative materials
  - Concrete using Plastic waste
  - Concrete using Steel slag
  - Concrete using factory wastes
  - Self Compacting concrete, Fibre reinforced concrete, Ferro cement 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 Collection and 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

ARRANGEMENT OF CONTENTS:

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

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

3.2 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.

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

3.4 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.**

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

3.6 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 the matter under this head.

3.7 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.

3.8 Chapters – The chapters may be broadly divided into 3 parts

(i) Introductory chapter,

(ii) Chapters developing the main theme of the project work such as

1. Objectives
2. Collection of data and required survey work
3. Management and construction procedure
4. Resources scheduling and networking
5. Design details
6. Required drawing set
7. Utility to society if any and Conclusion

The main text will be divided into several chapters and each chapter may be further divided into 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 the

reference where they are cited.

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

3.9 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.

3.10 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:

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

3.10.1 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.

4.0 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.

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CED 610 CONSTRUCTION MANAGEMENT

MODEL QUESTION PAPER

Time: 3 Hrs **Max. Marks: 100**

Note: Answer all questions. All questions carry equal marks

PART- A						**Marks 10X3=30**
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**BLOOMS LEVEL**	**CO**	**PO**	
1.	What are the classifications of construction planning?	I	R	D610.1	PO1,PO2	
2.	What is meant by Project Report?	I	R	D610.1	PO1,PO2	
3.	State any two requirements of a project office.	II	U	D610.2	PO1,PO2,PO3	
4.	What is nominal muster roll?	II	R	D610.2	PO1,PO2	
5.	What is the expansion of CPM?	III	R	D610.3	PO1,PO2	
6.	What is PERT?	III	R	D610.3	PO1,PO2	
7.	When disputes are developed between the Owner and contractor?	IV	R	D610.4	PO1,PO2,PO3	
8.	What is the function of trade Union?	IV	R	D610.4	PO1,PO2	
9.	Define MIS.	V	U	D610.5	PO1,PO2	
10.	Write the basic concepts of estimation.	V	R	D610.5	PO1,PO2	
	PART- C					**Marks 5X14=70**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11. a	(i) What are the objectives of construction management? (ii) What are the factors to be considered in the feasibility study of a project?	14	I	R R	D610.1	PO1,PO2,PO3 PO4,PO5,PO6, PO7
(OR)						
b	Explain the function of construction management in National development	14	I	R	D610.1	PO1,PO2,PO3 PO4,PO5,PO6, PO7
12. a	i. What do you understand by decentralization? Explain i. Explain the basic difference between construction supervision and construction superintendence?	14	II	R U	D610.2	PO1,PO2,PO3 PO4,PO5,PO6, PO7
(OR)						
b	Explain the duties and responsibilities of chief engineer and superintending engineer of State P.W.D.	14	II	U	D610.2	PO1,PO2,PO3 PO4,PO5,PO6, PO7

13. a	Draw a critical path and determine the project duration time for the following details. Activity 0-1 0-2 1-3 2-3 3-4 4-5 Duration in days 18 4 5 4 6 6	14	III	AN	D610.3	PO1,PO2,PO3 PO4,PO5,PO6, PO7
(OR)						
b	Explain the terms "material resource" and "human resources"	14	III	R	D610.3	PO1,PO2,PO3 PO4,PO5,PO6, PO7
14 a	Describe in details the different forms of quality assurance Techniques	14	IV	R	D610.4	PO1,PO2,PO3 PO4,PO5,PO6, PO7
(OR)						
b	I. What are the causes of accidents in the construction site? II. What is the need of labour legislation?	14	IV	R R	D610.4	PO1,PO2,PO3 PO4,PO5,PO6, PO7
15 a	Mention the different types of entrepreneurial development programs existing in India.	14	V	R	D610.5	PO1,PO2,PO3 PO4,PO5,PO6, PO7
(OR)						
b	Mention the different types of entrepreneurial development programs existing in India.	14	V	R	D610.5	PO1,PO2,PO3 PO4,PO5,PO6, PO7

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as presented below:

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

CED620 ESTIMATION, COSTING AND VALUATION

MODEL QUESTION PAPER

Time: 3 Hrs **Max. Marks: 100**

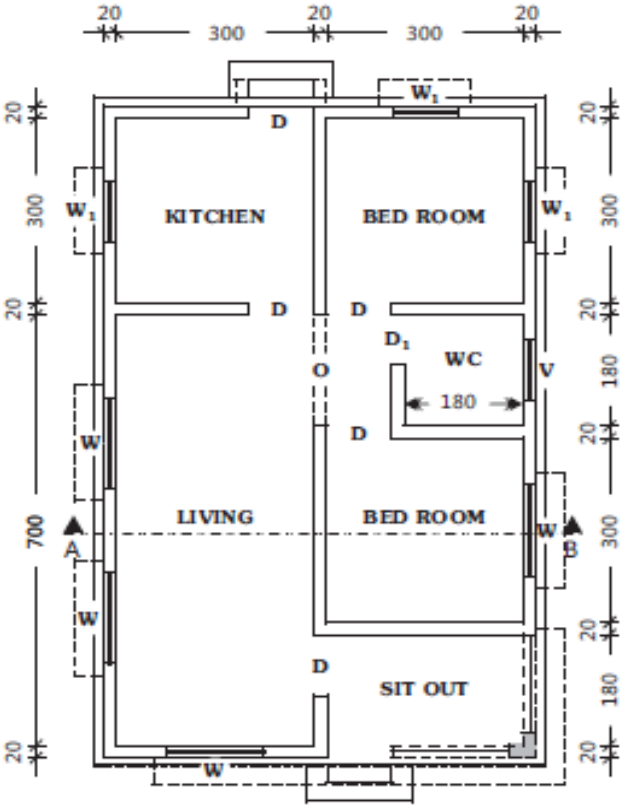
Note: Answer all questions. All questions carry equal marks

	PART- A				Marks 10X3=30
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**BLOOMS LEVEL**	**CO**	**PO**
1.	What are the different types of estimates and define cubical content method of estimate?	I	R	D620.1	PO1,PO2,PO3,PO6
2.	What do you mean by "Contingency provision"? Give examples	I	R	D620.1	PO,PO2,PO3,PO6
3.	State the use of standard data book in the analysis of rates.	II	U	D620.2	PO,PO2,PO3,PO6
4.	Write any three materials for which the lead cost is more than their actual cost.	II	R	D620.2	PO,PO2,PO3,PO6
5.	What particulars are needed to arrive at a reasonable rate for earth work in trenches?	III	R	D620.3	PO1,PO2,PO3,PO6
6.	Compare and contrast Trade system and Group system of taking quantities.	III	U	D620.3	PO1,PO2,PO3,PO6
7.	Prepare the detailed estimate for brick work septic tank of size 4mx3m and depth 4musing 230mm thick brick wall all around and115mm thick R.C.C baffle wall in the middle	IV	AN	D620.4	PO1,PO2,PO3,PO6
8.	Prepare the detailed estimate for 15cm thick R.C.C. slab of room size 3mx4m	IV	E	D620.4	PO1,PO2,PO3,PO6
9.	Define "fair rent".	V	R	D620.5	PO1,PO2,PO3,PO6
10.	Write the factors which govern the rent of a building	V	R	D620.5	PO1,PO2,PO3,PO6
	PART- B				**Marks 5X14=70**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.					
11. a	The actual cost of a single story residential building of plinth area 85$m^2$is found to be Rs.5,67,500/- in which 70% is towards the cost of materials and 30% towards the labour. It is proposed to construct a similar building of same specification with a plinth area of 145m^2 at a place where the cost of materials to be 20% more and cost of labour 15% less. Estimate the rough cost of the proposed building.	14	I	AN	D620.1	PO1,PO2, PO3,PO6

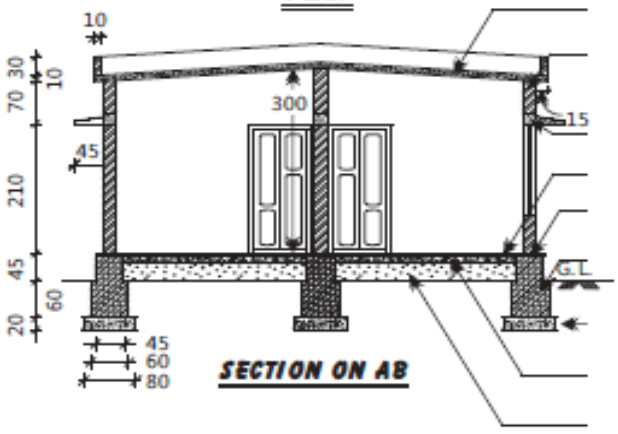
	(OR)					
b	I. Write a detailed specification for cement concrete 1:4:8 for foundation using 40mm size aggregates. II. Work out all the materials required for stucco plastering 12mm thick using granite chips – 250m^2. Materials required: 0.15m^3 C.M. 1:5 0.15m blue granite chips 86.50 kg. Cement.	14	I	AN	D620.1	PO1,PO2, PO3,PO6
12. a	Analyze and determine the rates for the following items of work with the given data. Flooring with 100mm thick base concrete using 40 mm size broken stone in cement mortar 1:4 and finished with 20mm thick ellis pattern cement concrete surface - 1 m^2	14	II	AN	D620.2	PO1,PO2, PO3,PO6
	(OR)					
b	I. Flush pointing R R masonry with cement mortar 1:4 – 1m^2. II. Supplying and fixing 100mm dia rain water pipes – 1m **1.Cementconcretebasewith40mmbrokenstoneinCM 1:4–10m^3** 40 mm broken stone 9.5 m^3 Cement mortar 1:4 3.8 m^3 Mason Category II 1.8 No. Mazdoor Category I 17.7 No. Mazdoor Category II 14.1 No. **2.Flooring with 100mm thick base concrete using 40mm size broken stone in CM1:4 and finishing with 20mm thick ellis pattern cement concrete surface- 10m^2** Cement concrete base 1 m^3 Stone chips 0.24 m^3 Cement 117 kg Mason Category I 0.50 No. Mazdoor Category I 1.10 No. Mazdoor Category II 4.30 No. Labour for tamping base crete course Rs.400 per 10m^2 Labour for fishing the floor work Rs.450 per 10m^2	14	II	AN	D620.2	PO1,PO2, PO3,PO6

	3.Flush pointing RR masonry with cement mortar 1:4–10m^2. Cement mortar 1:4 0.09 m^3 Mason Category II 1.6 No. Mazdoor Category I 0.5 No Mazdoor Category II 1.1 No. **4.Supplying and fixing 100mm dia rain water pipes – 3m** A.C pipe 100 dia 3 m M.S clamp 2 No. T.W plugs 4 No. Plumber 1 No Cement Packing LS **5.Cost of materials and lead particulars:** Material Unit Cost (Rs) Lead (kM) Ratefor Lead/kM(Rs) Handling charges(Rs) Cement 50kg 280.00 4 2.00 5.00 Sand 1m^3 250.00 30 20.00 60.00 Broken stone(40mm) 1m^3 380.00 20 18.00 40.00 Stone chips 1m^3 520.00 20 18.00 40.00 A.C pipe100mmdia 1m 65.00 4 3.00 5.00 M.S clamp 1No. 16.00 -- -- -- T.Wplugs 1No. 3.00 -- -- -- **6.Cost of Labour:** Mason Category I : Rs.550.00 per day Mason Category II : Rs.500.00 per day Plumber : Rs.550.00 per day Mazdoor Category I : Rs.400.00 per day Mazdoor Category II : Rs.275.00 per day Mixing charge for mortar : Rs.200 / m^3					
13. a	i. Taking of quantities using group system, Earth work excavation in foundation. ii. What are the qualities of a quantity surveyor.	14	III	AN	D620.3	PO1,PO2, PO3,PO6
	(OR)					
b	Explain with example, how will you prepare the abstract?	14	III	AN	D620.3	PO1,PO2, PO3,PO6
14	i Take the quantity of earth work in foundation for the	14	IV	AN	D620.4	PO1,PO2,

a	residential building shown in Sketch 1by Centre line method using Trade system ii Take the quantity of R.C.C in the sloped roof for the residential building shown in Sketch using Trade system (Sketch I — A plan and section of a small residential building with sloped RCC roof.)					PO3,PO6
	(OR)					
b	i. Take the quantity of brick work in foundation and basement for the community hall building shown in Sketch II. ii. Take the quantities of works in the parapet of the community hall building shown in Sketch II.	14	IV	AN	D620.4	PO1,PO2, PO3,PO6
15 a	i Write a small note on any two types of valuation ii A building was constructed in the year 2011 for a total cost of Rs.40 lakhs. Its salvage value in year 2030 is expected to be Rs.15 lakhs. Find the book value of the building in the year 2020 by sinking fund method, and also determine the annual instalment of sinking fund, assuming the rate of interest as 8%.	14	V	AN	D620.5	PO1,PO2, PO3,PO6
	(OR)					
b	i. How the nominal lease rents are fixed for Government buildings when they are rented to service associations of the department employees? ii. A person is having a house building worth Rs.12,00,000 at present market value, constructed 10 years back in a plot area of 240 m^2. The present market value of land in the locality is Rs.3000 per m^2. The cost of amenities provided to the building is Rs.1,20,000. Allowing a rate of depreciation of 2% and taking the nominal interest on investments as 9%, fix a fair monthly rent to the building.	14	V	AN	D620.5	PO1,PO2, PO3,PO6



PLAN



SECTION ON AB

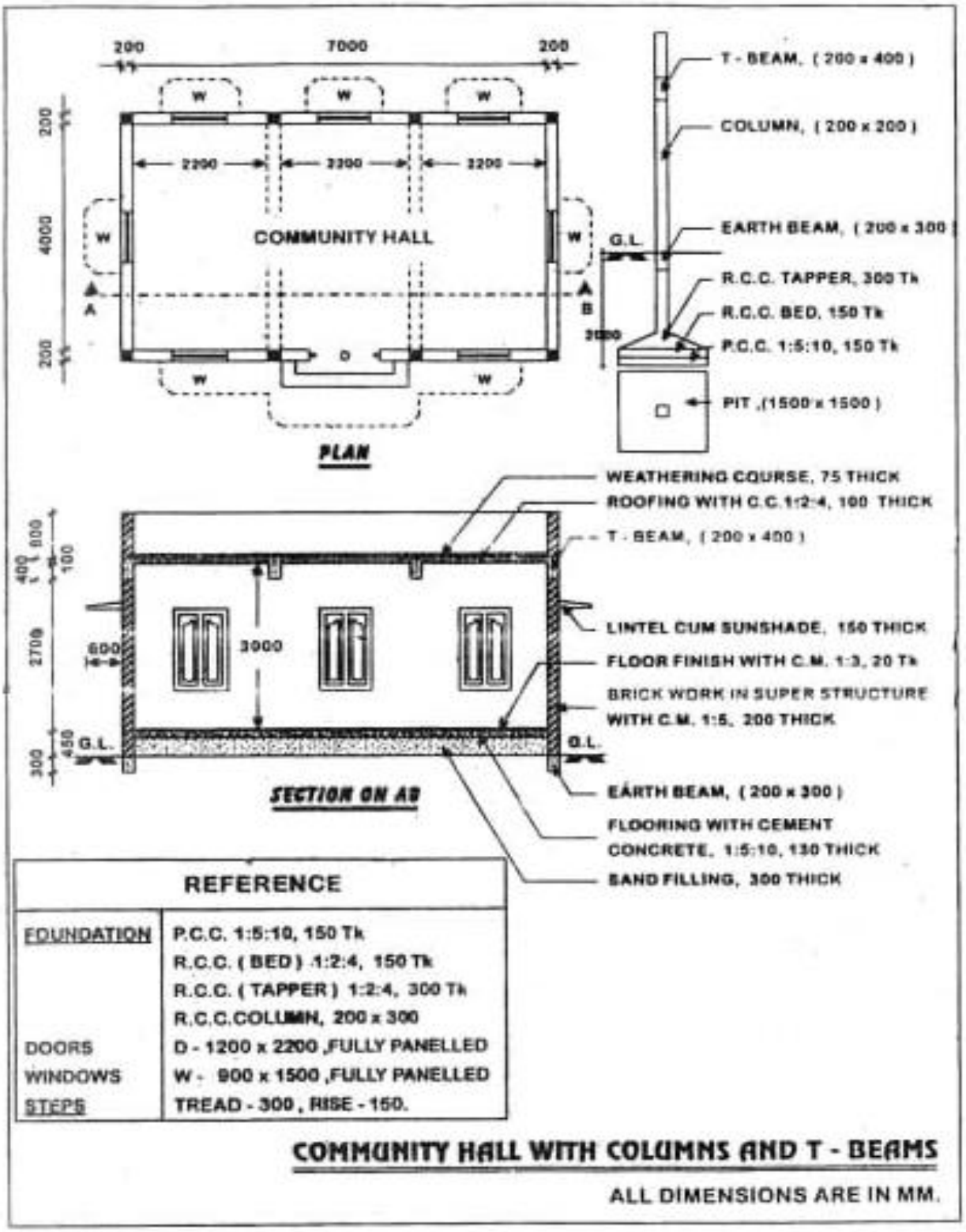
REFERENCE	
FOUNDATION	R.R. IN C.M. 1:8
BASEMENT	R.R. IN C.M. 1:8
WALLS	B.W. IN C.M. 1:6, 20 Tk
LINTEL	R.C.C. 1:2:4, 15 Tk
ROOF	R.C.C. 1:2:4, 10 Tk
DOORS	D - 100 x 210, FULLY PANELLED D_1 - 80 x 210, FULLY PANELLED
WINDOWS	W - 150 x 150 ,FULLY GLAZED W_1 - 100 x 150 ,FULLY GLAZED
VENTILATOR	V - 100 x 50 ,FULLY GLAZED
PLASTERING	INSIDE & OUT SIDE WITH C.M. 1:5, CEILING C.M. 1:3
STEPS	
TREAD	30
RISE	15

ROOFING WITH C.C.1:2:4, 100 THICK
BRICK WORK IN SUPER STRUCTURE WITH C.M. 1:5, 200 THICK
LINTEL CUM SUNSHADE, 150 THICK
FLOOR FINISH WITH C.M. 1:4, 20 THICK
D.P.C. WITH C.M. 1:3, 20 THICK
R.R.MASONRY IN FOUNDATION AND BASEMENT WITH C.M. 1:5
CEMENT CONCRETE FOR FOUNDATION, 1:4:8, 200 THICK
FLOORING WITH CEMENT CONCRETE, 1:4:8, 130 THICK
SAND FILLING, 300 THICK

A RESIDENTIAL BUILDING WITH TWO BED ROOM

ALL DIMENSIONS ARE IN CM.

Sketch1



Sketch2

QUESTION PAPER SETTING

The question paper setters are requested to follow the Revised Bloom's Taxonomy levels as presented below:

Bloom's Taxonomy	Lower Order Thinking Skills (LOTs)	Higher Order Thinking Skills (HOTs)
Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

CED631 SUSTAINABLE AND GREEN BUILDINGTECHNOLOGY

MODEL QUESTION PAPER

Time: 3 Hrs **Max. Marks: 100**

	PART- A				Marks 10X3=30
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**BLOOMS LEVEL**	**CO**	**PO**
1.	What is meant by Energy efficiency?	I	R	D631.1	PO1,PO2
2.	Explain about advanced passive heating and cooling techniques.	I	U	D631.1	PO1,PO2,PO5
3.	State the regulations of EIA.	II	U	D631.2	PO1,PO2
4.	Explain the environmental clearance for civil engineering projects.	II	U	D631.2	PO1,PO2,PO5
5.	Explain how hydro energy is produced.	III	U	D631.3	PO1,PO2
6.	What are the chemical sources of energy?	III	R	D631.3	PO1,PO2
7.	Explain any two green building materials and their use in construction.	IV	U	D631.4	PO1,PO2,PO5
8.	Write few lines about green building.	IV	R	D631.4	PO1,PO2
9.	What is the role of Energy efficiency?	V	R	D631.5	PO1,PO2
10.	State the role of NPC in building entrepreneurs.	V	R	D631.5	PO1,PO2

	PART- C					Marks 5X14=70
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11. a	What are the benefits of Green Building?	14	I	R	D631.1	PO1,PO2, PO5,PO6, PO7
	(OR)					
b	Explain the methods of reducing the waste	14	I	U	D631.1	PO1,PO2, PO5,PO6, PO7
12. a	Explain the necessity, procedures and types of energy Management Programs.	14	II	U	D631.2	PO1,PO2, PO5,PO6, PO7
	(OR)					
b	Explain the benefits and limitations of EIA	14	II	U	D631.2	PO1,PO2, PO5,PO6, PO7
13. a	What are the different forms of Renewable energy? Compare and contrast Renewable and Non renewable energy sources.	14	III	R	D631.3	PO1,PO2, PO5,PO6, PO7
	(OR)					

b	Explain the need of energy conservation. What is LEED India rating system?	14	III	U	D631.3	PO1,PO2, PO5,PO6, PO7
14. a	Explain the salient features of Green Building and explain the environmental design strategies for building construction.	14	IV	U	D631.4	PO1,PO2, PO5,PO6, PO7
	(OR)					
b	Explain in detail about the reuse of waste materials.	14	IV	U	D631.4	PO1,PO2, PO5,PO6, PO7
15. a	Explain in detail the functions of Government organization working for Energy conservation and Audit.	14	V	U	D631.5	PO1,PO2, PO5,PO6, PO7
	(OR)					
b	What is meant by MNRE and State its functions?	14	V	R	D631.5	PO1,PO2, PO5,PO6, PO7

QUESTION PAPER SETTING

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Level	R-Remember, U-Understand , Ap-Apply	An-Analyze, E-Evaluate, C-Create
% to be included	90%	10%

CEC632 URBAN PLANNING AND DEVELOPMENT

MODEL QUESTION PAPER

Time: 3 Hrs **Max. Marks: 100**

	PART- A					Marks 10X3=30
Note: Answer ALL questions .All questions carry equal marks.		**Unit**	**BLOOMS LEVEL**	**CO**		**PO**
1.	What is meant by zoning and state its importance?	I	R	D632.1		PO1,PO2
2.	Mention the types of surveys for planning a town.	I	R	D632.1		PO1,PO2
3.	Define "HUDCO" and CIDCO.	II	U	D632.2		PO1,PO2
4.	What are the classifications of a residential building?	II	R	D632.2		PO1,PO2,PO3
5.	Define "Green House".	III	R	D632.3		PO1,PO2
6.	What are the methods of execution in Master plan?	III	R	D632.3		PO1,PO2
7.	What are the advantages and disadvantages of Automatic light signals?	IV	U	D632.4		PO1,PO2,PO3
8.	Mention the classification of urban roads.	IV	R	D632.4		PO1,PO2
9.	What are the general rules of metro politan area?	V	R	D632.5		PO1,PO2
10.	Write notes on light plane.	V	R	D632.5		PO1,PO2
	PART- C					**Marks 5X14=70**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11. a	(i) What are the principles of town planning? Explain them briefly. (ii) What are the objects of zoning? Explain the advantages of zoning.	14	I	R R	D632.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	(i) Discuss the growth of towns according to origin (ii) Distinguish natural growth and planned growth	14	I	R R	D632.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
12. a	(i) Explain the advantages of housing finances. (ii) What are the objectives of NHP?	14	II	R R	D632.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						

b	(i) Describe the various housing programme by HUDCO (ii) What are the factors to be considered while selecting a building site?	14	II	R R	D632.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
13. a	(i) State the data to be collected for Re planning of a town. (ii) Explain the principles of a Garden city.	15	III	AN R	D632.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	(OR)					
b	(i) What is a master plan? What are the objects of master plan ? (ii) List the drawings to be prepared for the master plan	14	III	AN AN	D632.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
14. a	Write short notes on a) Arterial road b) Rectangular street system	14	IV	R	D632.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	(OR)					
b	(i) Describe the travel and transport strategy and policy (ii) Explain the transport policy of Tamil Nadu.	14	IV	U R	D632.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
15. a	Write about i) Reforms of Bye laws ii) Supervising agencies.	14	V	R	D632.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
	(OR)					
b	(i) What are the drawings to be submitted for plan approval? (ii) What are the details to be provided with the application for getting an approval for a building?	14	V	R R	D632.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

QUESTION PAPER SETTING

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% to be included	90%	10%

CED 633 WATER RESOURCES ENGINEERING

MODEL QUESTION PAPER

Time: 3 Hrs **Max. Marks: 100**

Note: Answer all questions. All questions carry equal marks

	PART- A					**Marks 10X3=30**
Note: Answer All questions carry equal marks.			**Unit**	**BLOOMS LEVEL**	**CO**	**PO**
1.	Why do you need to conserve water resources		I	R	D633.1	PO1,PO2
2.	State the methods to find mean rainfall over a drainage basin.		I	U	D633.1	PO1,PO2,PO3
3.	Define permeability.		II	U	D633.2	PO1,PO2,
4.	State any two methods of ground water exploration.		II	U	D633.2	PO1,PO2,PO3
5.	State the concept of basin management.		III	R	D633.3	PO1,PO2,PO3
6.	What do you mean by interlinking of rivers?		III	R	D633.3	PO1,PO2
7.	State any two types of spillway crest gates.		IV	U	D633.4	PO1,PO2,PO3
8.	State the necessity of lining of canal.		IV	R	D633.4	PO1,PO2,PO3
9.	How are watersheds classified?		V	U	D633.5	PO1,PO2
10.	State any two methods of seepage control		V	R	D633.5	PO1,PO2
	PART- C					**Marks 5X14=70**
Note: i). Answer all Questions choosing either division (A) or division (B) of each question. ii). All divisions carry equal marks.						
11. a	I. Write short notes on water resources management. ii Write about water resource potential in India.	14	I	R	D633.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	i. Explain the various components of a hydrological cycle with a neat sketch ii. Explain any two methods of estimation of runoff.	14	I	R	D633.1	PO1,PO2,PO3, PO4,PO5,PO6, PO7
12. a	Explain the geophysical methods of ground water exploration in detail	14	II	U	D633.2	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	(i) Describe the data to be collected in a ground water basin investigation	14	II	U	D633.2	PO1,PO2,PO3, PO4,PO5,PO6,

	(ii) Write short notes on basin management by conjunctive use.					PO7
13. a	Explain the different methods of river training.	14	III	R	D633.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	(i) How will you compute reservoir capacity from mass diagram? (ii) What are the points to be considered in the selection of a dam site?	14	III	R	D633.3	PO1,PO2,PO3, PO4,PO5,PO6, PO7
14. a	(i) Draw the typical cross section of canal and explain its components (ii) Explain the classification of canals based on their alignment.	14	IV	R	D633.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	(i) Write short notes on farmer's participation in irrigation management. (ii) Mention the effects of soil erosion.	14	IV	R	D633.4	PO1,PO2,PO3, PO4,PO5,PO6, PO7
15. a	(i) Describe the role of remote sensing and GIS in water shed management (ii) Mention the effects of soil erosion	14	V	R	D633.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7
(OR)						
b	(i) Explain the methods of waste water recharge for reuse. (ii) Write short notes on evaporation control.	14	V	R	D633.5	PO1,PO2,PO3, PO4,PO5,PO6, PO7

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