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INSTITUTE VISION

“To be a preferred institution in Engineering Education by achieving excellence in teaching and research and to remain as a source of pride for its commitment to holistic development of individual and society”

INSTITUTE MISSION

“To continuously strive for the overall development of students by educating them in a state-of-the-art- infrastructure, by retaining the best practices, faculties and inspire them to imbibe real-time problem-solving skills, leadership qualities, human values and societal commitments, so that they emerge as competent professionals”.

DEPARTMENT VISION


"To be the centre of excellence in providing education in the field of Civil Engineering to produce technically competent and socially responsible engineering graduates."

DEPARTMENT MISSION

"Educating students to prepare them for professional competencies in the broader areas of the Civil Engineering field by inculcating analytical skills, research abilities and encouraging culture of continuous learning for solving real time problems using modern tools."

PROGRAM EDUCATIONAL OBJECTIVES (PEO's):

1. *Pursue a successful career in various domains of Civil Engineering Profession by acquiring knowledge in mathematical, scientific and engineering fundamentals.*
2. *Analyze and design Civil Engineering systems with social awareness and responsibility.*
3. *Exhibit professionalism, ethical approach, communication skills & teamwork in their profession and adapt to modern trends by engaging in lifelong learning.*

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PROGRAM OUTCOMES (PO's):

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSO's):

PSO1: Inculcating in students practical knowledge and experimental skills to tackle Civil Engineering problems using technical and management skills, exhibiting professional ethics to meet the societal needs.

PSO2: Provide solutions related to Civil Engineering built environment through a multidisciplinary approach.

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Sl. No.	Purpose	Contact Person	
		Faculty	Instructor
01	HOD, Academics, Attestations, Exam forms signature	Prof. S.M.Chandrakanth	NA
02	Research Center Co-Ordinator,	Prof. S.M.Chandrakanth	NA
03	Industry-Institute-Interaction, Technical Magazine Coordinator (MoU, Ind. Visit etc.)	Prof. Shreedevi S B	NA
04	EMS / ED Cell coordinator, TP Cell officer	Prof. Preethi. R.Patil	NA
05	Project Coordinator, KSCST, IEEE coordinator, Smart India Hackathon, Scholarship, LIC	Prof. Preethi. R.Patil	NA
06	FACE / Website Coordinator	Prof. Sudarshan V Jore	NA
07	Civil/ IT Maintenance, Feedback / Publicity, Department News Letter, NSS, Student Welfare	Prof. Vishwanath I Patil	NA
08	GATE Coaching Coordinator	Prof. Sudarshan V Jore	NA
09	ISTE / E-Shikshana / E-learning / Internship	Prof. Vishwanath I Patil	NA
10	Women Empower cell, Conference, FDP, Workshop	Prof. Shreedevi S B	NA
11	IA Coordinator / Alumni coordinator	Prof. Shreedevi S B	NA
Institute Level			
		Faculty	Contact
12	Student Welfare Convener	Sri. M. G. Huddar	8217056798
13	TP Cell Coordinator	Sri. Pramod. Patil	9731104059
14	Anti-Ragging Committee Member	Sri. K.M.Akkoli	9739114856
15	Anti Raging Squad Convener	Sri. K.M.Akkoli	9739114856
16	Internal Complaint Committee Convener	Smt. S. S. Kamte	9008696825
17	Grievance redressal Convener	Sri. S. S. Tabhaj	9901398134
18	Sports and Cultural / Extra-Curricular Activities Convener	Sri. S.B. Sarawadi	9739109383

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2.0 Departmental Resources

Department of Civil Engineering was established in the year 2020 and is housed in a total area of 858 Sq. Mtrs.

2.1 Faculty Position

Sl.No.	Category	No. in Position	Average experience (in years)
01.	Teaching faculty	05	13
02.	Technical Supporting Staff	00	00
03.	Helper staff	02	21

2.2 Major Laboratories

Sl.No.	Name of the laboratory	Area in Sq. Mtrs	Amount Invested (Rs. in Lakhs)
01.	Computer Aided Building Planning & Drawing	66	14.37
02.	Building Materials Testing Laboratory	149	11.02
03.	Geology Laboratory	76	0.75
04.	Fluid Mechanics & Hydraulic Machines Laboratory	72	7.76
05	Surveying Practice	76	0.70
06	Concrete and Highway Materials Laboratory	72	1.30
07	Geotechnical Engineering Laboratory	73	0.70
08	Environmental Engineering Laboratory	200	New Setup Under Process

Total Investment in the Department

Rs. 36.60 Lakhs

3.0 Teaching Faculty Details

Sl. No.	Name	Designation	Qualification	Specialization	Professional Membership	Teaching Exp (In yrs.)	Phone No.
01	Prof. S.M.Chandrakanth	Asst. Prof./HOD	M. Tech. (PhD)	Highway Engineering	IAENG 220815	12	8867814854
02	Prof. Preethi R. Patil	Asst. Prof.	M. Tech.	Structures	--	04	9606557280
03	Prof. Vishwanath I Patil	Asst. Prof.	M. Tech	Structures	--	05	9975499979
04	Prof. Sudarshan V Jore	Asst. Prof.	M. Tech.	CT & M	--	02	9535459918
05	Prof. Shreedevi S B	Asst. Prof.	M. Tech.	CT & M	--	02	7760429556



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4.0 Institute Academic Calendar

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ACADEMIC CALENDAR OF EVENTS-02 (CoE-02) OF IV& VI SEMs FOR THE AY: 2023-24

Ref: 1) VTU CoE Revised Notification No.: VTU/BGM/AC-MBA/2023-24/6901, Dated 27th March 2024
2) VTU Tentative Academic Calendar Notification No.: VTU/BOS/AC-PG-6th sem BE/2023-24 /239, Dated 15th April 2024

Calendar	Date	Events & Holidays						
April -2024								
Sun	Mon	Tue	Wed	Thu	Fri	Sat	2 nd April 2024	Technovision-24
	1	2	3	4	5	6	9 th April 2024	GH: Yugadi Festival
7	8	9	10	11	12	13	11 th April 2024	GH: Kutub-A-Ramjan
14	15	16	17	18	19	20	22 nd April, 2024	Commencement of IV Semester Classes
21	22	23	24	25	26	27	29 th April, 2024	Commencement of VI Semester Classes
28	29	30					30 th April 2024	Institute Sports Events
May-2024			1 st May 2024	GH: Labours Day				
Sun	Mon	Tue	Wed	Thu	Fri	Sat	3 rd May 2024	Fun Week-HSIT Shambhrama-24
			1	2	3	4	7 th May 2024	GH: Lok Sabha Election
5	6	7	8	9	10	11	8 th May 2024	Graduation Day-24 & World Red Cross Day
12	13	14	15	16	17	18	9 th May 2024	Final Year Project Exhibition
19	20	21	22	23	24	25	10 th May 2024	GH: Basav Jayanti/Akhsay Trutiya
26	27	28	29	30	31		29 th -31 st May 2024	1 st IA Test for IV & VI Sems.
June-2024			31 st May 2024	1 st Feedback on Teaching-Learning (IV & VI Sems.)				
Sun	Mon	Tue	Wed	Thu	Fri	Sat	5 th June 2024	Display of 1 st IA Test Marks of IV & VI Sems.
			1	2	3	4	21 st -22 nd June 2024	Lab IA Test-I (IV & VI Sem. 2021 & 2022 Schemes)
5	6	7	8	9	10	11	21 st June 2024	International Yoga Day
12	13	14	15	16	17	18	27 th -29 th June 2024	2 nd IA Test for IV & VI Sems.
19	20	21	22	23	24	25	29 th June 2024	2 nd Feedback on Teaching-Learning (IV & VI Sems.)
26	27	28	29	30	31		3 rd July 2024	Display of 1 st IA Test Marks of IV & VI Sems.
July-2024			17 th June 2024	GH: Bakreed				
Sun	Mon	Tue	Wed	Thu	Fri	Sat	3 rd July 2024	International Plastic Bag Free Day
						1	11 th July 2024	World Population Day
2	3	4	5	6	7	8	15 th July 2024	World Youth Skills Day
9	10	11	12	13	14	15	17 th July 2024	GH: Last Day of Moharam
16	17	18	19	20	21	22	25 th -27 th July 2024	3 rd IA Test for IV & VI Sems.
23	24	25	26	27	28	29	28 th July 2024	World Nature Conservation Day
August-2024			30 th July 2024	Display of 3 rd IA Test Marks of IV & VI Sems.				
Sun	Mon	Tue	Wed	Thu	Fri	Sat	29 th -30 th July 2024	Lab IA Test-II (IV & VI Sem. 2021 & 2022 Schemes)
							31 st July 2024	Last Working Day of the VI Semester Classes
1	2	3	4	5	6	7	7 th August 2024	Last Working Day of the IV Semester Classes
7	8	9	10	11	12	13	12 th August 2024	International Youth Day
14	15	16	17	18	19	20	15 th August 2024	GH: Independence Day Celebration
21	22	23	24	25	26	27	8 th -17 th August 2024	VTU IV Sem Practical Examinations
28	29	30	31				19 th Aug. -12 th Sept. 2024	VTU IV Sem Theory Examinations
August-2024							1 st -10 th August 2024	VTU VI Sem Practical Examinations
Sun	Mon	Tue	Wed	Thu	Fri	Sat	12 th Aug. -14 th Sept. 2024	VTU VI Sem Theory Examinations
							20 th August 2024	Sadbhavana Diwas
4	5	6	7	8	9	10	26 th August 2024	Women's Equality Day
11	12	13	14	15	16	17	16 th Sept. 2024	Commencement of V Sem of AY: 2024-25
18	19	20	21	22	23	24		
25	26	27	28	29	30	31		

GH: General Holiday, LH: Local Holiday

Dr.S.N.Topannavar
IQAC Coordinator & Dean (Academics)

Dr.S.C.Kamate
Principal

Nidasoshi, Taq: Hukkeri, Dist: Belgaum, Karnataka - 591 236
Phone:+91-8333-278887, Fax:278886, Web:www.hsit.ac.in, Mail:principal@hsit.ac.in

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5.0 Scheme of Teaching & Examination

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)
(Effective from the academic year 2018 – 19)

VI Semester

B.E: Civil Engineering

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI												
B.E. in Civil Engineering												
Scheme of Teaching and Examinations 2021												
Outcome-Based Education(OBE) and Choice Based Credit System (CBCS)												
(Effective from the academic year 2021 - 22)												
VI SEMESTER												
Sl. No	Course and Course Code	Course Title	Teaching Department (TD) and Question and Answer Paper Setting Board (PSB)	Teaching Hours /Week				Examination			Credits	
				Theory Lecture	Tutorial	Practical/ Drawing	Self Study	Duration in hours	CIE Marks	SEE Marks		Total Marks
				L	T	P	S					
1	HSMC 21CV61	Construction Management and Entrepreneurship	TD: Civil Engg PSB: Civil Engg	3	0	0		03	50	50	100	3
2	IPCC 21CV62	Concrete Technology	TD: Civil Engg PSB: Civil Engg	2	2	2		03	50	50	100	4
3	PCC 21CV63	Design of Steel structure	TD: Civil Engg PSB: Civil Engg	2	2	0		03	50	50	100	3
4	PEC 21CV64x	Professional Elective Course-I	TD: Civil Engg PSB: Civil Engg					03	50	50	100	3
5	OEC 21CV65x	Open Elective Course-I	Concerned Department					03	50	50	100	3
6	PCC 21CVL66	Computer Aided Detailing of Structure	TD: Civil Engg PSB: Civil Engg	0	0	2		03	50	50	100	1
7	MP 21CVMP67	Mini Project	TD: Civil Engg PSB: Civil Engg	Two contact hours /week for interaction between the faculty and students.				--	100	--	100	2
8	INT 21INT68	Innovation/Entrepreneurship /Societal Internship	Completed during the intervening period of IV and V semesters.				--	100	--	100	3	
Total									500	300	800	22
Professional Elective - I												
21CV641	Design of Prestressed Concrete Structures		21CV644	Design Concept in Building Services								
21CV642	Applied Geotechnical Engineering		21CV645	Ground Water Hydraulics								
21CV643	Railways, Harbors, Tunneling and Airports		21CV646	Alternative Building Materials								
Open Electives – I offered by the Department to other Department students												
21CV651	Remote Sensing and GIS		21CV653	Occupational Health and Safety								
21CV652	Traffic Engineering		21CV654	Conservation of Natural Resources								

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Subject Title	CONSTRUCTION MANAGEMENT AND ENTREPRENEURSHIP		
Subject Code	21CV61	CIE Marks	50
Number of Lecture Hrs / Week	(3:0:0)	SEE Marks	50
Total Number of Lecture Hrs	40	Exam Hours	03
CREDITS – 03			

FACULTY DETAILS:		
Name: Prof. V.I.Patil	Designation: Asst. Professor	Experience: 5 Years
No. of times course taught: 02		Specialization: Structural Engineering

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	Civil Engineering	III	Building Material and Construction

2.0 Course Objectives


This course will enable students to

1. Understand the concept of planning, scheduling, cost and quality control, safety during construction, organization and use of project information necessary for construction project.
2. Inculcate Human values to grow as responsible human beings with proper personality.
3. Keep up ethical conduct and discharge professional duties
4. Develop an entrepreneurial outlook and mind set along with critical skills and knowledge to manage risks associated with entrepreneurs.

3.0 Course Outcomes

After studying this course, students will be able to:

	Course Outcome	RBT Level	POs
C316.1	Understand various management principles of construction industry.	L1, L2, L3, L4	1,2,3,5, 6,8,12
C316.2	Use planning, organizing, scheduling, monitoring and controlling techniques for managing construction activity.	L1, L2, L3, L4	1,2,3,5, 6,8,12
C316.3	Understand importance of quality control and safety in construction.	L1, L2, L3, L4	1,2,3,5, 6,8,12
C316.4	Understand managing data pertaining to construction project.	L1, L2, L3, L4	1,2,3,5, 6,8,12
C316.5	Evaluate alternatives and develop capital budget for different scenarios.	L1, L2, L3, L4	1,2,3,5, 6,8,12
Total Hours of instruction			40

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4.0 Course Content

Module-1

Management: Characteristics of management, functions of management, importance and purpose of planning process, types of plans. **Construction Project Formulation:** Introduction to construction management, project organization, management functions, management styles.

Construction Planning and Scheduling: Introduction, types of project plans, work breakdown structure, Grant Chart, preparation of network diagram- event and activity based and its critical path critical path method, PERT method, concept of activity on arrow and activity on node.

Module-2

Resource Management: Basic concepts of resource management, class of labour, Wages & statutory requirement, Labour Production rate or Productivity, Factors affecting labour output or productivity.

Construction Equipments: classification of construction equipment, estimation of productivity for: excavator, dozer, compactors, graders and dumpers. Estimation of ownership cost, operational and maintenance cost of construction equipments. Selection of construction equipment and basic concept on equipment maintenance

Materials: material management functions, inventory management.

Module-3

Construction Quality , safety and Human Values: Construction quality process, inspection, quality control and quality assurance, cost of quality, ISO standards. Introduction to concept of Total Quality Management.

HSE: Introduction to concepts of HSE as applicable to Construction. Importance of safety in construction , Safety measures to be taken during Excavation , Explosives , drilling and blasting , hot bituminous works , scaffolds / platforms / ladder , form work and equipment operation. Storage of materials. Safety through legislation, safety campaign. Insurances.

Ethics : Morals, values and ethics, integrity, trustworthiness , work ethics, need of engineering ethics, Professional Duties, Professional and Individual Rights, Confidential and Proprietary Information, Conflict of Interest Confidentiality, Gifts and Bribes, Price Fixing, Whistle Blowing.

Module-4

Introduction: Principles of Engineering Economy, Engineering Decision- Makers, Engineering and Economics, Problem solving and Decision making, Intuition and Analysis, Tactics and Strategy. Interest and Interest Factors: Interest rate, Simple interest, Compound interest, Cash- flow diagrams, Exercises and Discussion.

Comparison of alternatives: Present worth, annual equivalent, capitalized and rate of return methods, Minimum Cost analysis and break even analysis.

Replacement Analysis: Replacement studies, replacement due to deterioration, obsolescence, inadequacy, economic life for cyclic replacements, Exercises, Problems. Break- Even Analysis: Basic concepts, Linear Break- Even analysis, Exercises, Problems.


Depreciation: Causes of Depreciation, Basic methods of computing depreciation charges, Exercises, Problems.

Module-5

Introduction to Entrepreneurship – Learn how entrepreneurship has changed the world. Identify six entrepreneurial myths and uncover the true facts. Explore E-cells on Campus

Listen to Some Success Stories: - Global legends Understand how ordinary people become successful global entrepreneurs, their journeys, their challenges, and their success stories. Understand how ordinary people from their own countries have become successful entrepreneurs.

Characteristics of a Successful Entrepreneur Understand the entrepreneurial journey and learn the concept of different entrepreneurial styles. Identify your own entrepreneurship style based on your personality traits, strengths, and weaknesses. Learn about the 5M Model, each of the five entrepreneurial styles in the model, and how they differ from each other. Communicate Effectively: Learn how incorrect

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assumptions and limiting our opinions about people can negatively impact our communication. Identify the barriers which cause communication breakdown, such as miscommunication and poor listening, and learn how to overcome them.

Business Planning Process: Business planning process, marketing plan, financial plan, project report and feasibility study, guidelines for preparation of model project report for starting a new venture. Introduction to international entrepreneurship opportunities, entry into international business, exporting, direct foreign investment, venture capital.

5.0 Relevance to future subjects

SI No	Semester	Subject	Topics
01	V	Extensive Survey Project	Construction Project

6.0 Relevance to Real World


SI No	Real World Mapping
01	Mega Construction Project Planning and Scheduling

7.0 Gap Analysis and Mitigation

SI No	Delivery Type	Details
01	Tenders Topic	Government and Private process

8.0 Books Used and Recommended to Students

Text Books
1. P C Tripathi and P N Reddy, “Principles of Management”, Tata McGraw-Hill Education 2. Chitkara, K.K, “Construction Project Management: Planning Scheduling and Control”, Tata McGraw-Hill Publishing Company, New Delhi. 3. Poornima M. Charantimath , “Entrepreneurship Development and Small Business Enterprise”, Dorling Kindersley (India) Pvt. Ltd., Licensees of Pearson Education 4. Dr. U.K. Shrivastava “Construction Planning and Management”, Galgotia publications Pvt. Ltd. New Delhi. 5. Bureau of Indian standards – IS 7272 (Part-1)- 1974 : Recommendations for labour output constant for building works:
Reference Books
1. Robert L Peurifoy, Clifford J. Schexnayder, Aviad Shapira, Robert Schmitt, “Construction Planning, Equipment, and Methods (Civil Engineering), McGraw-Hill Education 2. Harold Koontz, Heinz Weihrich, “Essentials of Management: An International, Innovation, and Leadership perspective”, T.M.H. Edition, New Delhi 3. Frank Harris, Ronald McCaffer with Francis Edum-Fotwe, “ Modern Construction Management”, Wiley Blackwell 4. Mike Martin, Roland Schinzinger, “Ethics in Engineering”, McGraw-Hill Education 5. Chris Hendrickson and Tung Au, “Project Management for Construction - Fundamentals Concepts for Owners, Engineers, Architects and Builders”, Prentice Hall, Pittsburgh

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6. James L.Riggs, David D. Bedworth , Sabah U. Randhawa “ Engineering Economics” 4

9.0

Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

<https://en.wikipedia.org/wiki/cme>

10.0

Magazines/Journals used and Recommended to Students

Sl.No	Magazines/Journals	Website
1	AEÜ - International Journal of CME	www.journals.elsevier.com/aeu

11.0

Examination Note

Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50)in the semester-end examination(SEE), and a minimum of 40% (40marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation: Three Unit Tests each of 20 Marks (duration 01 hour)

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester Two assignments each of **10 Marks**
4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks(duration 01 hours)**
6. At the end of the 13th week of the semester The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks** (to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods /question paper is designed to attain the different levels of Bloom’s taxonomy as per the outcome defined for the course.

Semester End Examination: Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)


1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module


12.0

Course Delivery Plan

Module	Lecture No.	Content of Lecturer	% of Portion
MODULE 1	01	Management: Characteristics of management.	20
	02	Functions of management, importance and purpose of planning process, types of plans.	
	03	Construction Project Formulation: Introduction to construction management	
	04	Project organization, management functions, management styles.	
	05	Construction Planning and Scheduling: Introduction	
	06	Types of project plans, work breakdown structure, Grant Chart.	

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	07	Preparation of network diagram- event and activity based and its critical path critical path method	
	08	PERT method, concept of activity on arrow and activity on node.	
MODULE 2	09	Resource Management: Basic concepts of resource management.	20
	10	Class of lab our, Wages & statutory requirement.	
	11	Labour Production rate or Productivity	
	12	Factors affecting labour output or productivity.	
	13	Construction Equipments: classification of construction equipment.	
	14	Estimation of productivity for: excavator, dozer, compactors, graders and dumpers.	
	15	Estimation of ownership cost, operational and maintenance cost of construction equipments. Selection of construction equipment and basic concept on equipment maintenance.	
	16	Materials: material management functions, inventory management.	
MODULE 3	17	Construction quality process, inspection, quality control and quality assurance, cost of quality.	20
	18	ISO standards. Introduction to concept of Total Quality Management.	
	19	HSE: Introduction to concepts of HSE as applicable to Construction	
	20	Importance of safety in construction , Safety measures to be taken during Excavation , Explosives ,drilling and blasting , hot bituminous works , scaffolds / platforms / ladder , form work andequipment operation.	
	21	Storage of materials. Safety through legislation, safety campaign. Insurances	
	22	Ethics: Morals, values and ethics, integrity, trustworthiness, work ethics, need of engineering ethics.	
	23	Professional Duties, Professional and Individual Rights.	
	24	Confidential and Proprietary Information, Conflict of Interest Confidentiality, Gifts and Bribes, Price Fixing, Whistle Blowing.	
MODULE 4	25	Introduction to engineering economy	20
	26	Principles of engineering economics, concept on Micro and macro analysis	
	27	Problem solving and decision making	
	28	Interest and time value of money:	
	29	Concept of simple and compound interest, interest formula for: single payment, equal payment and uniform gradient series.	
	30	Nominal and effective interest rates, deferred annuities, capitalized cost.	
	31	Comparison of alternatives: Present worth, annual equivalent, capitalized and rate of return methods.	
	32	Minimum Cost analysis and break even analysis.	
MODULE 5	33	Introduction to Entrepreneurship – Learn how entrepreneurship has changed the world. Identify six entrepreneurial myths and uncover the true facts. Explore E-cells on Campus	20
	34	Listen to Some Success Stories: - Global legends Understand how ordinary people become successful global entrepreneurs, their journeys, their challenges, and their success stories.	
	35	Understand how ordinary people from their own countries have become successful entrepreneurs	
	36	Characteristics of a Successful Entrepreneur Understand the entrepreneurial journey and learn the concept of different entrepreneurial styles. Identify your own entrepreneurship style based on your personality traits, strengths, and weaknesses.	

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37	Learn about the 5M Model, each of the five entrepreneurial styles in the model, and how they differ from each other. Communicate Effectively: Learn how incorrect assumptions and limiting our opinions about people can negatively impact our communication.
38	Identify the barriers which cause communication breakdown, such as miscommunication and poor listening, and learn how to overcome them.
39	Business Planning Process: Business planning process, marketing plan, financial plan, project report and feasibility study, guidelines for preparation of model project report for starting a new venture.
40	Introduction to international entrepreneurship opportunities, entry into international business, exporting, direct foreign investment, venture capital.

13.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl. No	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1: Questions on module 1	Students study basics Management: Construction Project Formulation: Construction Planning and Scheduling	Module 1 of the syllabus	3	Individual Activity.	Text 1 & 2 Ref Book 2
2	Assignment 2: Questions on module 2	Students study the Resource Management: Construction Equipments	Module 2 of the syllabus	5	Individual Activity.	Text 1 & 2 Ref Book 2
3	Assignment 3: Questions on module 3	Students study Construction Quality safety and Human Values: HSE: Introduction Ethics	Module 3 of the syllabus	8	Individual Activity.	Text 1 & 2 Ref Book 2
4	Assignment 4: Questions on module 4	Student study the Introduction to engineering economy Interest and time value of money: Comparison of alternatives.	Module 4 of the syllabus	10	Individual Activity.	Text 1 & 2 Ref Book 2
5	Assignment 5: Questions on module 5	Students Study Entrepreneurship: Business Planning Process.	Module 5 of the syllabus	12	Individual Activity.	Text 1 & 2 Ref Book 2

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14.0
QUESTION BANK
MODULE 1

1. Discuss the ideal characteristics that a Management?
2. What is Work break down structure?
3. Briefly explain the key steps involved in Construction planning?
4. Discuss suitability advantages and disadvantages of Autocratic and Democratic style of management?
5. Discuss on autocratic and democratic management style

MODULE 2

1. What are the fundamental resource management is real time visibility
2. What are the types of earth work equipments?
3. Why firms have implemented materials management system
4. What does the construction worker do ? Explain some of the main duties of a general construction worker
5. What are successful resource management requires

MODULE 3





1. Explain quality assurance
2. Explain seven quality management principles
3. Explain management commitment and leadership
4. Explain HSE and safety in construction
5. Explain safety construction problems.


MODULE 4

1. Define engineering mechanics
2. Explain the principle of engineering economy
3. Difference between micro economics macro economics
4. Explain interest formulas
5. Define simple interest and compound interest

MODULE 5

1. Explain concept of Entrepreneur
2. Explain Characteristics of of Entrepreneur
3. Difference between Entrepreneur and Manager.
4. Explain functions of entrepreneur.
5. Explain types of entrepreneurs.

Prepared by	Checked by		
			
Prof: V.I. Patil	Prof: Preethi R. Patil	HOD	Principal

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Subject Title	CONCRETE TECHNOLOGY		
subject Code	21CV62	CIE Marks	50
Number of Lecture Hrs / Week	(2+2+2)	SEE Marks	50
Total Number of Lecture Hrs	50	Exam Hours	03
CREDITS – 04			

FACULTY DETAILS:		
Name: Prof. V.I.Patil	Designation: Asst. Professor	Experience: 5 Years
No. of times course taught: 01		Specialization: Structural Engineering

1.0 Prerequisite Subjects:

Sl. No	Branch	Semester	Subject
01	Civil Engineering	I/II	Elements of Civil Engineering

2.0 Course Objectives

Make the students to learn


1. To recognize material characterization of ingredients of concrete and its influence on properties of concrete
2. Proportion ingredients of Concrete to arrive at most desirable mechanical properties of Concrete.
3. Ascertain and measure engineering properties of concrete in fresh and hardened state which meet the requirement of real time structures.

3.0 Course Outcomes

After studying this course, students will be able to:

	Course Outcome	RBT Level	POs
C317.1	Assess and infer various properties of cement, cementitious materials, Fine and coarse aggregate as per codal provision and specifications	L1, L2, L3, L4	1,2,3,5, 6,8,12
C317.2	Design the concrete mix for the given materials as per IS:10262-2019 provisions	L1, L2, L3, L4	1,2,3,5, 6,8,12
C317.3	Understand the manufacturing process and assess the quality of green	L1, L2, L3, L4	1,2,3,5, 6,8,12
C317.4	Describe the properties of fresh and hardened concrete – Strength and Durability aspects	L1, L2, L3, L4	1,2,3,5, 6,8,12
C317.5	Examine and Evaluate properties of Cement and Concrete	L1, L2, L3, L4	1,2,3,5, 6,8,12
Total Hours of instruction			50

4.0 Course Content

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Module-1

CEMENT AND AGGREGATES: Cement, Chemical composition, Physical and chemical properties, Other Cementitious materials and composition - GGBS, Fly ash, rice Husk ash, Silica fume, Hydration of cement, Factors influencing and affecting Hydration of cement, Types of cement. Fine aggregate - grading, analysis, Specific gravity, bulking, moisture content, deleterious materials. Coarse aggregate – Importance of size, shape and texture. Grading of aggregates - Sieve analysis, specific gravity, Flakiness and elongation index, crushing, impact and abrasion tests. Codal Provisions.

Module-2

FRESH PROPERTIES OF CONCRETE: Workability - Process of manufacture of concrete: Batching, Mixing, Assessment of Workability of Concrete, Factors affecting workability, Measurement of workability – slump test, flow test, Compaction factor test and Vee-Bee Consistometer tests, Segregation and bleeding, Transporting, Placing, Compaction, Curing, need and Types of curing, accelerated curing.

Module-3

ADMIXTURES: Classification, effect on fresh and hardened concrete, retention time, Dosage and their effects, Influence on properties of paste, mortar, and concrete Types of concrete (in brief).

MIX DESIGN PROCEDURE: Concept of Concrete Mix design, variables in proportioning, exposure conditions, Procedure of mix design as per IS 10262-2019, Numerical examples of Mix Design. Highlights of Other methods of Mix Design as per other codes.

Module-4

HARDENED CONCRETE: Factors affecting strength, w/c ratio, gel/space ratio, maturity concept, Effect of aggregate properties, assessment of compressive strength, flexural strength, tensile strength, bond strength and modulus of elasticity, aggregate - cement bond strength, factors influencing strength and codal provisions, Relation between modulus of elasticity and strength, factors affecting modulus of elasticity, Poisson Ratio.

Module-5

Durability - Definition, significance, short term and long-term durability. Shrinkage - plastic shrinkage and drying shrinkage, Factors contributing to cracks in concrete - plastic shrinkage, settlement cracks, Factors affecting shrinkage, Effect of creep. Measurement of creep, factors influencing creep. Permeability, Sulphate attack, Chloride attack, carbonation, freezing and thawing, Construction joints and Expansion joints, Thermal effect of concrete. Codal Provisions.

5.0


Relevance to future subjects

Sl No	Semester	Subject	Topics
01	VII	Pavement materials and construction	Pavement materials.

6.0

Relevance to Real World

Sl No	Real World Mapping
01	Mix Design of Concretes in different grades
02	Analysis of pavement materials

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7.0 Gap Analysis and Mitigation

SI No	Delivery Type	Details
01	Tutorial	Practicals should clubbed with theory for better understanding
02	NPTEL	https://twitter.com/concrete technology.com

8.0 Books Used and Recommended to Students

Text Books

- 1.M.S.Shetty , "Concrete Technology" - Theory and Practice, , S.Chand and Company, New Delhi, 2002.
2. Concrete Technology (Trade, Technology & Industry), George White, Delmar Pu
- 3.Concrete: Microstructure, Properties, and Materials, P. Kumar Mehta , Paulo J. M. Monteiro, McGraw-Hill Education
- 4.Neville, A.M. , Properties of Concrete": , ELBS, London
- 5.A.R.Santakumar , "Concrete Technology" –. Oxford University Press (2007)'

Reference Books

- 1.Advanced Concrete Technology, Zongjin Li, Wiley; 1 edition
- 2.GambhirDhanpatRai&Sons , "Concrete Manual" -, New Delhi
- 3.N.KrishnaRaju, "Concrete Mix Design" -, Sehgal - publishers
- 4.IS:10262-2016 , "Recommended guidelines for concrete mix design", Bureau of Indian Standards, New Delhi


9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

Cement <https://nptel.ac.in/courses/105102012/1>
 Aggregates <https://nptel.ac.in/courses/105102012/6>
 Mineral admixtures<https://nptel.ac.in/courses/105102012/11>
 Chemical admixtures <https://nptel.ac.in/courses/105102012/9>
<https://nptel.ac.in/courses/105102012/10>
 Concrete mix design <https://nptel.ac.in/courses/105102012/14>
 Concrete production & fresh concrete <https://nptel.ac.in/courses/105102012/19>
 Engineering properties of concrete<https://nptel.ac.in/courses/105102012/23>
 Dimensional stability & durability <https://nptel.ac.in/courses/105102012/27> Durability of concrete
<https://nptel.ac.in/courses/105102012/31>
 Special concretes <https://nptel.ac.in/courses/105102012/36>

10.0 Magazines/Journals used and Recommended to Students

Sl.No	Magazines/Journals	Website
1	AEÜ - International Journal of hydrology and irrigations.	www.journals.elsevier.com/aeu

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11.0 Examination Note

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

CIE for the theory component of IPCC

Two Tests each of **20 Marks (duration 01 hour)**

- First test at the end of 5th week of the semester
- Second test at the end of the 10th week of the semester

Two assignments each of **10 Marks**

- First assignment at the end of 4th week of the semester
- Second assignment at the end of 9th week of the semester

Scaled-down marks of two tests and two assignments added will be CIE marks for the theory component of IPCC for **30 marks**.

CIE for the practical component of IPCC

On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.

The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.

The laboratory test (**duration 02/03 hours**) at the end of the 15th week of the semester /after completion of all the experiments (whichever is early) shall be conducted for **50 marks** and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **20 marks**.


SEE for IPCC Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (duration 03 hours)

1. The question paper will have ten questions. Each question is set for **20 marks**.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
3. The students have to answer 5 full questions, selecting one full question from each module.

The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper shall include questions from the practical component).


The minimum marks to be secured in CIE to appear for SEE shall be the 12 (40% of maximum marks-30) in the theory component and 08 (40% of maximum marks -20) in the practical component. The laboratory component of the IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 04/05 questions to be set from the practical component of IPCC, the total marks of all questions should not be more than the **20 marks**.

SEE will be conducted for **100 marks** and students shall secure 35% of the maximum marks to qualify in the SEE. Marks secured will be **scaled down to 50**.

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12.0 Course Delivery Plan

Module	Lecture No.	Content of Lecturer	% of Portion
MODULE 1	01	CEMENT AND AGGREGATES: Cement,	20
	02	Chemical composition, Physical and chemical properties	
	03	Other Cementitious materials and composition	
	04	GGBS, Fly ash rice Husk ash, Silica fume, Hydration of cement,	
	05	Factors influencing and affecting Hydration of cement, Types of cement..	
	06	Fine aggregate - grading, analysis, Specific gravity, bulking, moisture content, deleterious materials	
	07	Coarse aggregate – Importance of size, shape and texture.	
	08	Grading of aggregates - Sieve analysis, specific gravity,	
	09	Flakiness and elongation index, crushing, impact and abrasion tests.	
	10	Codal Provisions.	
MODULE 2	11	FRESH PROPERTIES OF CONCRETE: Workability.	20
	12	Process of manufacture of concrete	
	13	Batching, Mixing, Assessment of Workability of Concrete	
	14	Factors affecting workability	
	15	Flow test, Compaction	
	16	Factor test and Vee-Bee Consistometer tests	
	17	Segregation and bleeding	
	18	Transporting, Placing, Compaction	
	19	Curing, need and Types of curing	
	20	Accelerated curing.	
MODULE 3	21	ADMIXTURES: Classification	20
	22	Effect on fresh and hardened concrete	
	23	Retention time, Dosage and their effects	
	24	Influence on properties of paste, mortar	
	25	Concrete Types of concrete (in brief).	
	26	MIX DESIGN PROCEDURE:	
	27	Concept of Concrete Mix design,	
	28	Variables in proportioning, exposure conditions	
	29	Procedure of mix design as per IS 10262-2019, Numerical examples	
	30	Mix Design. Highlights of Other methods of Mix Design as per other codes.	
MODULE 4	31	HARDENED CONCRETE:	20
	32	Factors affecting strength	
	33	W/c ratio, gel/space ratio, maturity concept	
	34	Effect of aggregate properties,	
	35	Assessment of compressive strength	
	36	Flexural strength, tensile strength, bond strength and modulus of elasticity	
	37	Aggregate - cement bond strength	
	38	Factors influencing strength and codal provisions	
	39	Relation between modulus of elasticity and strength	
	40	Factors affecting modulus of elasticity, Poisson Ratio.	
MODULE 5	41	Durability - Definition, significance,	20
	42	Short term and long-term durability.	
	43	Shrinkage – plastic shrinkage and drying shrinkage	
	44	Factors contributing to cracks in concrete	

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	45	Plastic shrinkage, settlement cracks	
	46	Factors affecting shrinkage, Effect of creep. Measurement of creep,	
	47	Factors influencing creep. Permeability	
	48	Sulphate attack, Chloride attack, carbonation freezing and thawing	
	49	Construction joints and Expansion joints	
	50	Thermal effect of concrete. Codal Provisions.	

13.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl. No	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1: Questions on module 1	Students study of the basics of Cement and aggregates	Module 1 of the syllabus	3	Individual Activity.	Text 1 & 2 Ref Book 2
2	Assignment 2: Questions on module 2	Students study of the Fresh properties of concrete	Module 2 of the syllabus	5	Individual Activity.	Text 1 & 2 Ref Book 2
3	Assignment 3: Questions on module 3	Students study of the Admixtures & mix design procedure	Module 3 of the syllabus	8	Individual Activity.	Text 1 & 2 Ref Book 2
4	Assignment 4: Questions on module 4	Students study of the Hardened concrete	Module 4 of the syllabus	10	Individual Activity.	Text 1 & 2 Ref Book 2
5	Assignment 5: Questions on module 5	Students Study of the Durability	Module 5 of the syllabus	12	Individual Activity.	Text 1 & 2 Ref Book 2


14.0 QUESTION BANK

MODULE1: CEMENT AND AGGREGATES:

1. What is the common classification of aggregates?
2. What is meant by Light weight aggregates?
3. Define Heavy weight aggregates
4. Mention the Classification of aggregate In accordance with size
5. Mention the Classification of aggregate In accordance with source
6. What are the properties of Aggregate?
7. Define Fineness modulus of aggregate
8. List various types of cement
9. What is the chemical composition of cement?
10. What are the various test which are to be done on aggregates?
11. What is mean by controlled concrete?
12. What is meant by hydration of cement?
13. What are the two process of manufacturing of Cement?
14. Classify the various concrete chemical based on their use.
15. Describe the process of manufacture of cement by wet process.
16. Describe the process of manufacture of cement by dry process.
17. Explain in details the various specifications of concrete.
18. Explain in detail of any three tests for aggregates.







19. What are the end products of hydration? Explain.
20. What are the different tests conducted on wet cement?
MODULE 2: FRESH PROPERTIES OF CONCRETE:
1. Write short notes on a. Accelerators. B. Retarders c. Plasticizers.
2. What are the various factors which affect the work ability of concrete?
3. What are the Causes of bleeding and segregation ?
4. What is batching of concrete?
5. Explain in detail of any three tests for Fresh Concrete.
6. List the different types of work ability aids.
7. What are the various factors which affect the work ability of concrete?
8. What are the various factors affecting the work ability of concrete- Explain.
9. Explain the influence of bleeding and segregation on fresh concrete.
10. Explain the different stages of manufacture of concrete.
MODULE 3: HARDENED CONCRETE:
1. How fly ash concrete gain strength in later age? Explain Mechanism.
2. Discuss the effects of adding fly ash, silica fume and ground granulated blast furnace slag in concrete.
3. Explain in detail the composition, physical properties of the mineral admixture GGBS and discuss the benefits of using it in concrete.
4. Discuss at length the composition, properties of the mineral admixture Fly Ash and write the benefits of using it in concrete
5. What is meant by proportioning of concrete?
6. Write the Factors Influencing Consistency.
7. What are the Factors affecting Strength of Hardened concrete?
8. What are the Factors affecting Strength of Hardened concrete?
9. What are the factors influencing the selection of materials?
10. Explain the method of finding flexural and split tensile strength of concrete
11. With a neat graph, explain different modulus of elasticity of concrete
12. Define Shrinkage cracking
13. Define Plastic Shrinkage cracking
14. Define Tension cracking
15. Define Creep
MODULE 4: CONCRETE MIX PROPORTIONING:
1. Define Nominal Mixes
2. Define Standard mixes
3. What is Designed Mixes?
4. What are the Factors affecting the choice of mix proportions?
5. Explain the Design Procedure for IS method of Concrete Mix Design.
6. Design the concrete mix for grade M20 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement.
7. Design the concrete mix for grade M20 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement.
8. Design the concrete mix for grade M30 with suitable conditions. Find the quantities of constituents of the mix for a bag of cement
9. Design the concrete mix for the following data: characteristic compressive strength = 20MPa, maximum size of aggregate = 20mm (angular), Degree of workability = 0.9 CF, Degree of quality control = good and type of exposure = severe. Water absorption by CA = 0.5% and moisture content in FA = 2.0%. Assume any suitable missing data.
10. Design the concrete mix for the following data: characteristic compressive strength = 35MPa,

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maximum size of aggregate = 20mm (angular), Degree of workability = 0.9 CF, Degree of quality control = good and type of exposure = severe. Water absorption by CA = 1% and moisture content in FA = 1.5%. Assume any suitable missing data.

MODULE 5: SPECIAL CONCRETES:

1. Explain in detail about the statistical quality control and acceptance criteria of concrete.
2. What are the various types of chemical attacks encountered by concrete? What precautions can be taken to ensure good quality concrete in coastal structures?
3. Give the factors affecting the measurement of Ultrasonic pulse velocity test?
4. Define Aerated Concrete.
5. What is the general use of Shotcrete?
6. What are the various methods of underwater construction? Explain.
7. What are the effects of cold weather concreting and hot weather concreting?
8. How can high-strength concrete be classified? Explain.
9. List the differences between polymer – impregnated concrete, polymer – modified concrete, and polymer concrete.
10. What are the various quality control tests done to ensure good performance of polymer concrete?
11. What are the basic properties of fiber – reinforced concrete which can be advantageously made use of in the design of structural elements?
12. In what way can the behavior of FRC can be used for seismic – resistant design?
13. Explain in detail the method of design of light weight concreting
14. Describe the procedure of Mass concrete and Grouting.
15. Explain the properties of polymer Impregnated Concrete.
16. What are the advantages of using ready mixed concrete instead of site mixed concrete?

Prepared by	Checked by		
			
Prof:V.I.Patil	Prof:Preethi R.Patil	HOD	Principal



Subject Title	Design of steel structural Elements		
Subject Code	21CV63	CIE Marks	50
Number of Lecture Hrs / Week	(2:2:0)	SEE Marks	50
Total Number of Lecture Hrs	40	Exam Hours	03
CREDITS – 03			

FACULTY DETAILS:		
Name: Prof. Preethi R. Patil	Designation: Asst. Professor	Experience: 6 Years
No. of times course taught: 03	Specialization: Structural Engineer	

1.0 Prerequisite Subjects:

Sl.No	Branch	Semester	Subject
01	Civil Engineering	I	Elements of civil engineering
02	Civil Engineering	III	Strength of Materials
03	Civil Engineering	V	Design of RC Structural Elements

2.0 Course Objectives

1. To recognize different forms of steel structures.
2. To understand the deflections of beams and trusses due to loads.

3.0 Course Outcomes

Having successfully completed this course, the student will be able to:

Sl.No	Course Outcome	RBT Level	POs
C318.1	Possess knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code, provisions and plastic behaviour of structural steel.	L1,L2,L3,L4	1,2,3,5,6,8,12
C318.2	Understand the Concept of Bolted and Welded connections.	L1,L2,L3,L4	1,2,3,5,6,8,12
C318.3	Understand the Concept of Design of compression members, built-up columns and columns splices.	L1,L2,L3,L4	1,2,3,5,6,8,12
C318.4	Understand the Concept of Design of tension members, simple slab base and gusseted base.	L1,L2,L3,L4	1,2,3,5,6,8,12
C318.5	Understand the Concept of Design of laterally supported and unsupported steel beams.	L1,L2,L3,L4	1,2,3,5,6,8,12
Total Hours of instruction			40

4.0 Course Content



Module-1

Introduction: Advantages and Disadvantages of Steel Structures, Limit state method Limit State of Strength, Structural Stability, Serviceability Limit states, Failure Criteria of steel, Design Consideration, Loading and load combinations, IS code provisions, Specification and Section classification.

Plastic Behavior of Structural Steel: Introduction, Plastic theory, Plastic Hinge Concept, Plastic collapse load, load factor, Shape factor, Theorem of plastic collapse, Methods of Plastic analysis, Plastic analysis of Continuous Beams.

Module-2

Bolted Connections: Introduction, Types of Bolts, Behavior of bolted joints, Design of High Strength friction Grip (HSFG) bolts, Design of Simple bolted Connections (Lap and Butt joints) and bracket connections.

Welded Connections: Introduction, Types and properties of welds, Effective areas of welds, Weld Defects, Simple welded joints for truss member and bracket connections, Advantages and Disadvantages of Bolted and Welded Connections.

Module-3

Design of Compression Members: Introduction, Failure modes, Behavior of compression members, Sections used for compression members, Effective length of compression members, Design of compression members and built up Compression members, Design of Laced and Battened Systems.

Module-4

Design of Tension Members: Introduction, Types of Tension members, Slenderness ratio, Modes of Failure, Factors affecting the strength of tension members, Design of Tension members and Lug angles, Splices, Gussets.

Design of Column Bases: Design of Simple Slab Base and Gusseted Base.

Module-5

Design of Beams: Introduction, Beam types, Lateral Stability of beams, factors affecting lateral stability, Behavior of Beams in Bending, Design strength of laterally supported beams in Bending, Design of Laterally unsupported Beams [No Numerical Problems], Shear Strength of Steel Beams.

Beam to Beam Connections, Beam to Column Connection and Column Splices [No Numerical Problems].

5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
1.	V	Analysis of indeterminate structure	Structural analysis
2.	V	Design of reinforced concrete	Analysis of Beams
3.	VI	Design of steel structure	Analysis of Beams

6.0 Relevance to Real World

Sl No	Real World Mapping
01	Load distribution on structure , deflection of beams

7.0 Gap Analysis and Mitigation

Sl No	Delivery Type	Details
01	Tutorial	Topic: Analysis of plane trusses

8.0 Books Used and Recommended to Students

Text Books
1. Reddy C S, Basic Structural Analysis, Tata McGraw Hill, New Delhi.
2. Muthu K U. etal, Basic Structural Analysis, 2nd edition, IK International Pvt. Ltd., NewDelhi,2015.
3. Bhavikatti, Structural Analysis, Vikas Publishing House Pvt. Ltd, New Delhi,2002.



Reference Books

- . Hibbeler R C, Structural Analysis, Prentice Hall, 9th edition, 2014.
- . Devadoss Menon, Structural Analysis, Narosa Publishing House, New Delhi, 2008
- . Prakash Rao D S, Structural Analysis, University Press Pvt. Ltd, 2007.

Additional Study material & e-Books

Class notes and vtu notes

9.0 Relevant Websites (Reputed Universities & Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References

<https://en.m.wikipedia.org>

10.0 Magazines/Journals used and Recommended to Students

Sl.No	Magazines/Journals	Website
1	International Journal of MAT	www.matjournals.com

11.0 Examination Note

Assessment Details both (CIE and SEE):

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation: Theory: 30 marks and Lab Component: 20 marks= Total 50 marks

1. Topics taught by Lecture hours need to be assessed by
2. Three tests each for a duration of one hour and an average of the marks scored is reduced to 20
3. Any two Activities Namely quizzes, Assignment, seminar/ presentation, mini-project leading to demonstration will be considered for 10 marks.

4. Practical Sessions need to be assessed by appropriate rubrics and viva-voce methods. This will contribute to 20 marks. Note: Minimum of 80% of the laboratory components have to be covered.

o Rubrics for each Experiment taken average for all Lab components – 15 Marks

o Viva-Voce– 5 Marks (more emphasized on demonstration topics)

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (duration 03 hours)

The question paper will have ten questions. Each question is set for 20 marks.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module.

The students have to answer 5 full questions, selecting one full question from each module.

Theoretical aspects as well as relevant sketches should be drawn neatly.

Scheme of Evaluation for Internal Assessment (40 Marks)

(a) Internal Assessment test in the same pattern as that of the main examination : 30 Marks.

(b) Assignments: 10 Marks

SCHEME OF EXAMINATION:

Question paper pattern:

1. The question paper will have **ten** full questions carrying equal marks.

2. Each full question consisting of **20** marks.

3. There will be **two** full questions (with a **maximum** of **four** sub questions) from each module.

4. Each full question will have sub question covering all the topics under a module.

5. The students will have to answer **five** full questions, selecting **one** full question from each module.



12.0 Course Delivery Plan

Module	Lecture No.	Content of Lecturer	Teaching Method	Laboratory Component	% of Portion
Module 1	1	Advantages and Disadvantages of Steel Structures	Chalk and Talk, Power-point Presentation	Visit to an Industry using steam for their process and prepare a comprehensive report	20
	2	Limit State of Strength, Structural Stability, Serviceability Limit states			
	3	Failure Criteria of steel, Design Consideration,			
	4	Loading and load combinations, IS Specification and Section classification code provisions			
	5	Plastic Behavior of Structural Steel, Introduction			
	6	Plastic theory, Plastic Hinge Concept, Plastic collapse load,			
	7	load factor, Shape factor, Theorem of plastic collapse,			
	8	Methods of Plastic analysis, Plastic analysis of Continuous Beams.			
Module 2	9	Bolted Connections: Introduction	Chalk and Talk, Power-point Presentation		40
	10	Types of Bolts, Behavior of bolted joints,			
	11	Design of High Strength, friction Grip (HSFG) bolts			
	12	Design of Simple bolted Connections (Lap and Butt joints) and bracket connections.			
	13	Welded Connections: Introduction			
	14	Types and properties of welds, Effective areas of welds,			
	15	Weld Defects, Simple welded joints for truss member and bracket connections			
Module 3	16	Advantages and Disadvantages of Bolted & Welded Connections	Chalk and Talk, Power-point Presentation		60
	17	Design of Compression Members: Introduction			
	18	Failure modes of compression members			
	19	Behavior of compression members			
	20	Sections used for compression members			
	21	Effective length of compression members			
	22	Design of compression members			
Module 4	23	built up Compression members	Chalk and Talk, Power-point Presentation		80
	24	Design of Laced systems, Battened Systems			
	25	Design of Tension Members Introduction			
	26	Types of Tension members			
	27	Slenderness ratio, Modes of Failure			
	28	Factors affecting the strength of tension members,			
	29	Design of Tension members and Lug angles,			
Module 5	30	Design of Tension members	Chalk and Talk, Power-point Presentation		100
	31	Design of Column Bases			
	32	Design of Simple Slab Base, Gusseted Base			
	33	Design of Beams: Introduction, Beam types, Lateral Stability of beams			
	34	factors affecting lateral stability,			
	35	Behavior of Beams in Bending			
	36	Design strength of laterally supported beams in Bending			
37	Design of Laterally unsupported Beams				
38	Shear Strength of Steel Beams				
39	Beam to Beam Connections, Beam to Column Connection				
40	Column Splices				

13.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl.No	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1:	Understand the concepts of steel	Module 1 of	3	Individual	Text 1



	Questions on module 1	structures	the syllabus		Activity.	Ref Book 2
2	Assignment 2: Questions on module 2	Understand the concept of bolted and welded connection	Module 2 of the syllabus	5	Individual Activity.	Text 1 Ref Book 3
3	Assignment 3: Questions on module 3	Understand the concept of design of compression members	Module 3 of the syllabus	8	Individual Activity.	Text 1 Ref Book 3
4	Assignment 4: Questions on module 4	Understand the concept of design of tension members	Module 4 of the syllabus	10	Individual Activity.	Text 1 Ref Book 3
5	Assignment 5: Questions on module 5	Understand the concept of design of laterally steel beams	Module 5 of the syllabus	12	Individual Activity.	Text 1 Ref Book 2

14.0 QUESTION BANK

MODULE 1

1. What are the advantages of steel structures ?
2. What are the disadvantages of steel structures?
3. What are the difference between limit state & working stress method?
4. What are the rolled steel section ?
5. Explain briefly with a neat sketch different rolled steel section?

MODULE 2

1. What are the advantages of bolted connection?
2. What are the advantages of welded connection?
3. What are the disadvantages of bolted connection?
4. What are the disadvantages of welded connection?
5. What are the common defects in welding?

MODULE 3

1. Explain different modes of failure of compression members
2. Design a built up column consisting of two channels section placed back to back to carry a load of 1000KN Over a length of 10m the ends of compression members are restrained in position but not in direction design Single lacing system use 20mm diameter bolts of property class 4.6 for connection.
3. Design compressive strength of [ISHB300@576.8N/m](#), Length of column is 3.5m and both ends are fixed.
4. Explain different modes of axially loaded column
5. Design a single angle discontinuous strut to carry a factored load of 65kN. The length of strut is 3m, between inter section

MODULE 4

1. Explain factor affecting strength of tension members
2. Explain different modes of failure of tension member with neat sketch
3. Explain slab base and gusseted base plate with neat sketch
4. Design a unequal single angle section to carry a load of 140KN use M20 bolts of grade 4.6 and the length of member is 3m.
5. Explain Lug angles and Column splices.

MODULE 5



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Civil Engg. Dept

Academic
Course Plan

2023-24 (Even)

1. Explain factor affecting lateral stability of beam
2. Explain with neat sketch beam to beam connection
3. Explain with neat sketch beam to column connection
4. Calculate the load carrying capacity of laterally restrained simply supported beam with ISMB 500 @86.9 Kg/m section for an effective span of 6m.

Prepared by	Checked by		
Prof. Preethi.R.Patil	Prof. V.I.Patil	HOD	Principal

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	Approved by AICTE, New Delhi, Permanently Affiliated to VTU, Belagavi Recognized under 2(f) & 12B of UGC Act, 1956		Academic Course Plan
	Accredited at 'A' Grade by NAAC & Programmes Accredited by NBA: CSE & ECE		2023-24 (Even)
			Rev: 00

Subject Title	ALTERNATE BUILDING MATERIALS		
Subject Code	21CV646	IA Marks	50
Number of Lecture Hrs / Week	2:2:0	Exam Marks	50
Total Number of Lecture Hrs	40	Exam Hours	03
			Credits: 3

FACULTY DETAILS:		
Name: Prof. S. M. Chandrakanth	Designation: Asst. Prof. / HOD	Experience: 14 Years
No. of times course taught: 04		Specialization: Highway Engineering

1.0 Prerequisite Subjects:

Sl.No	Branch	Semester	Subject
01	Civil Engineering	I/II	Civil Engineering and Mechanics
02	Civil Engineering	III	Earth Resources and Engineering
03	Civil Engineering	IV	Green Buildings
04	Civil Engineering	V	Quality Control and Quality Assurance

2.0 Course Objectives


This course will enable students to;

1. Understand environmental issues due to building materials and the energy consumption in manufacturing building materials
2. Study the various masonry blocks, masonry mortar and structural behaviour of masonry under compression.
3. Study the alternative building materials in the present context.
4. Understand the alternative building technologies which are followed in present construction field.
5. Understand the equipment's used in the production of alternative building materials with current technologies by cost effective analysis, techniques and case studies.

3.0 Course Outcomes

Having successfully completed this course, the student will be able to.

CO	Course Outcome	Cognitive Level	POs
C324.1	Solve the problems of Environmental issues concerned to building materials and cost-effective building technologies	L1, L2, L3	1,2,3,4,6,8,12
C324.2	Identify appropriate type of masonry unit and mortar, design of structural masonry under axial compression.	L1, L2, L3, L4	1,2,3,4,6,8,12
C324.3	Identify the various alternative building materials and suggest agro and industrial wastes in manufacturing of building	L1, L2, L3	1,2,3,4,5,6,8,12
C324.4	Recommend various types of alternative building technologies and design of energy efficient building by considering local climatic condition and building material.	L1, L2, L3	1,2,3,4,5,6,8,12
C324.5	Identify new technologies for manufacture of alternative building materials and suggest basic cost saving techniques in planning, design and construction.	L1, L2, L3	1,2,3,4,5,6,8,12
Total Hours of Instruction		40	

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4.0

Course Content

Module-1

Environmental Implications of Buildings

Energy use, carbon emissions, water use, waste disposal; Building materials: sources, methods of production and environmental Implications. Embodied Energy in Building Materials:

Transportation Energy for Building Materials; Maintenance Energy for Buildings. BUILDINGS 9 Framed Construction, Masonry Construction. Resources for Building Materials, Alternative concepts. Recycling of Industrial and Buildings Wastes. Biomass Resources for buildings.

Module-2

Elements of Structural Masonry:

Elements of Structural Masonry, Masonry materials, requirements of masonry units' characteristics of bricks, stones, clay blocks, concrete blocks, stone boulders, laterite Blocks, Fal- G blocks and Stabilized mud block. Manufacture of stabilized blocks.

Structural Masonry Mortars: Mortars, cementations materials, sand, natural & manufactured, types of mortars, classification of mortars as per BIS, characteristics and requirements of mortar, selection of mortar. Uses of masonry, masonry bonding, Compressive strength of masonry elements, Factors affecting compressive strength, Strength of Prisms/wallets and walls, Effect of brick bond on strength, Bond strength of masonry: Flexure and shear, Elastic properties of masonry materials and masonry, Design of masonry compression elements subjected to axial load.

Module-3

Alternate Building Materials:

Lime, Pozzolana cements, Raw materials, Manufacturing process, Properties and uses. Fibers- metal and synthetic, Properties and applications. Fiber reinforced plastics, Matrix materials, Fibers organic and synthetic, Properties and applications. Building materials from agro and industrial wastes, Types of agro wastes, Types of industrial and mine wastes, Properties and applications. Masonry blocks using industrial wastes. Construction and demolition wastes.

Module-4


Alternate Building Technologies:

Use of arches in foundation, alternatives for wall constructions, composite masonry, confined masonry, cavity walls, rammed earth, Ferro cement and ferroconcrete building components, Materials and specifications, Properties, Construction methods, Applications. Top-down construction, Mivan Construction Technique. Alternate Roofing Systems: Concepts, Filler slabs, Composite beam panel roofs, Masonry vaults and domes.

Module-5

Equipment for Production of Alternate Materials:

Machines for manufacture of concrete, Equipment's for production of stabilized blocks, Moulds and methods of production of precast elements, Cost concepts in buildings, Cost saving techniques in planning, design and construction, Cost analysis: Case studies using alternatives.

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5.0 Relevance to future subjects

Sl No	Semester	Subject	Topics
01	VII	Design of Masonry Structures	Masonry Units, Materials, types and masonry construction Strength and stability of axially loaded masonry walls, effect of unit strength, mortar strength, joint thickness, Load considerations and design of Masonry subjected to axial loads, Design of walls subjected to concentrated axial and eccentric loads, Design of Laterally and transversely loaded walls

6.0 Relevance to Real World

Sl. No	Real World Mapping
01	To understand environmental issues due to building materials.
02	To understand energy consumption in manufacturing building materials
03	To learn various masonry blocks, masonry mortar & structural behavior of masonry under compression.
04	To analyse and design the construction strength and stability of axially loaded masonry walls.
05	To prepare alternative building materials in the present context.
06	Students are able to understand effect of unit strength, mortar strength, joint thickness, Load considerations and design of Masonry subjected to axial loads,
07	Understand the structural design of walls subjected to concentrated axial and eccentric loads, Design of Laterally and transversely loaded walls
08	To learn the development of nations which have extensive building construction
09	To investigate the alternative building technologies which are followed in present construction field.
10	To understand equipment's used in the production of alternative building materials with current technologies by cost effective analysis, techniques and case studies.

7.0 Gap Analysis and Mitigation


Sl. No	Delivery Type	Details
01	Tutorial	Topic: Demonstration to building blocks in Basic Material Testing laboratory
02	NPTEL	Building materials and Construction
03	NPTEL	NOC: Sustainable Materials and Green Buildings

8.0 Books Used and Recommended to Students

Text Books
1. KS Jagadish, B V Venkatarama Reddy and K S Nanjunda Rao, "Alternative Building Materials and Technologies", New Age International pub.
2. Arnold W Hendry, "Structural Masonry", Macmillan Publishers.
Reference Books
1. RJS Spence and DJ Cook, "Building Materials in Developing Countries", Wiley pub.
2. LEED India, Green Building Rating System, IGBC pub.
3. IGBC Green Homes Rating System, CII pub.
4. Relevant IS Codes.
Additional Study Material & e-Books
1. NPTEL notes and Videos
2. VTU online notes.

9.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References
01) https://www.digimat.in/nptel/courses/video/105102088/L01.html
02) https://www.digimat.in/nptel/courses/video/105102195/L01.html

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10.0 Magazines/Journals Used and Recommended to Students

Sl. No	Magazines/Journals	Website
01	Construction and Building Materials	https://www.sciencedirect.com/journal/construction-and-building-materials
02	Materials and Structures	https://www.springer.com/journal/11527
03	Journal of Materials in Civil Engineering	https://www.scimagojr.com/journalsearch.php?q=16299&tip=sid&clean=0

11.0 Examination Note

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5th week of the semester
2. Second test at the end of the 10th week of the semester
3. Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4th week of the semester
5. Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

6. At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of methods of CIE.

Each method of CIE should have a different syllabus portion of the course).


CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per scheduled timetable, with common question papers for subject **(duration 03 hours)**


1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module

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12.0 Course Delivery Plan

Module	Lecture No.	Content of Lecture	% of portion
1	1	Environmental Implications of Buildings: Energy use, carbon emissions, water use, waste disposal;	20%
	2	Building materials: sources, methods of production and environmental Implications.	
	3	Embodied Energy in Building Materials:	
	4	Transportation Energy for Building Materials;	
	5	Maintenance Energy for Buildings. BUILDINGS 9 Framed Construction,	
	6	Masonry Construction. Resources for Building Materials,	
	7	Alternative concepts. Recycling of Industrial and Buildings Wastes.	
	8	Biomass Resources for buildings	
2	9	Elements of Structural Masonry, Masonry materials, requirements of masonry units' characteristics of bricks, stones, clay blocks, concrete blocks,	20%
	10	stone boulders, laterite Blocks, Fal- G blocks and Stabilized mud block. Manufacture of stabilized blocks	
	11	Structural Masonry Mortars: Mortars, cementations materials, sand, natural & manufactured, types of mortars, classification of mortars as per BIS,	
	12	characteristics & requirements of mortar, selection of mortar. Uses of masonry, masonry bonding,	
	13	Compressive strength of masonry elements, Factors affecting compressive strength,	
	14	Strength of Prisms/wallets and walls, Effect of brick bond on strength,	
	15	Bond strength of masonry: Flexure and shear, Elastic properties of masonry materials and masonry,	
	16	Design of masonry compression elements subjected to axial load.	
3	17	Alternative Building Materials: Lime, Pozzolana cements, Raw materials, Manufacturing process,	20%
	18	Properties and uses. Fibers- metal and synthetic, Properties and applications.	
	19	Fiber reinforced plastics, Matrix materials, Fibers organic and synthetic, Properties & applications.	
	20	Building materials from agro and industrial wastes ,Types of agro wastes,	
	21	Types of industrial and mine wastes,	
	22	Properties and applications of industrial waste	
	23	Masonry blocks using industrial wastes.	
	24	Construction and demolition wastes	
4	25	Alternative Building Technologies: Use of arches in foundation, alternatives for wall constructions,	20%
	26	composite masonry, confined masonry,	
	27	cavity walls, rammed earth	
	28	Ferro cement and ferroconcrete building components,	
	29	Materials and specifications, Properties, Construction methods, Applications. Top down construction,	
	30	Mivan Construction Technique.	
	31	Alternative Roofing Systems: Concepts, Filler slabs	
	32	Composite beam panel roofs, Masonry vaults and domes	
5	33	Equipment for Production of Alternative Materials: Machines for manufacture of concrete	20%
	34	Equipment's for production of stabilized blocks,	
	35	Moulds and methods of production of precast elements,	
	36	Cost concepts in buildings,	
	37	Cost saving techniques in planning, design and construction, (contd...)	
	38	Cost saving techniques in planning, design and construction,	
	39	Cost analysis: Case studies using alternatives (contd...)	
	40	Cost analysis: Case studies using alternatives	

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13.0 Internal Assessments, Assignments, Quiz, Mini Project, Seminars

Sl. No.	Title	Outcome expected	Allied study	Week No.	Max Marks	Individual / Group activity	Reference: book/website /Paper
1	Assignment 1: Questions on module 1	Students study the topics and write the Answers. Get practice to solve numerical of university question papers.	Module 1&2 of syllabus	4	10	Individual Activity, Written solution expected.	Book 1, 2, 3 & notes, also 1-3 of reference list.
2	Internal Assessment - I	Students study the topics & write / reproduce the answers in blue books	Module 1&2 of syllabus	5	20	Individual Assessment, Blue Books as record	Book 1, 2, 3 & notes, also 1-3 of reference list.
3	Assignment 2: Questions on module 3	Students study the topics and write the Answers. Get practice to solve numerical of university question papers.	Module 3&4 of syllabus	9	10	Individual Activity, Written solution expected.	Book 1, 2, 3 & notes, also 1-3 of reference list.
4	Internal Assessment - II	Students study the topics & write / reproduce the answers in blue books	Module 3&4 of syllabus	10	20	Individual Assessment, Blue Books as record	Book 1, 2, 3 & notes, also 1-3 of reference list.
5	Internal Assessment - III	Students study the topics & write / reproduce the answers in blue books	Module 5 of syllabus	15	20	Individual Assessment, Blue Books as record	Book 1, 2, 3 & notes, also 1-3 of reference list.
6	Quiz	Students study the topics and write the answers for MCQ. Get practice to solve numerical	All Modules of syllabus	15	20	Individual Activity, Written Choice solution expected.	Book 1, 2, 3 & notes, also 1-3 of reference list.


14.0 QUESTION BANK

MODULE – 1

1. Explain energy in building materials
2. Describe the life cycle of embodied energy.
3. Explain global warming and effect of construction Industry on global warming?
4. Explain concept of green building?
5. State the requirements of green buildings with reference to IGBC and LEED
6. Explain rain water harvesting and solar passive architecture.
7. Explain environmentally friendly and cost-effective building technology buildings?
8. List out the requirements of buildings in different climatic regions.

MODULE – 2

1. Explain elements of structural masonry and its materials.
2. State the requirements of masonry units.
3. Explain the characteristics of bricks, stones, clay blocks, stone boulders and concrete blocks.
4. Explain the characteristics of laterite blocks, Fal – G blocks?
5. Explain the manufacturing of stabilizes mud blocks?

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MODULE – 3





1. Explain the manufacturing process of lime and pozzolana cements
2. Explain the properties and uses of lime and pozzolana
3. State the properties and applications of metal fibers, synthetic fibers
4. State the properties and applications of fiber reinforced plastics, matrix materials.
5. State the properties and applications of organic and synthetic fibers.
6. State the properties and applications of agro and industrial wastes.
7. Explain types of agro wastes, industrial and mine waste
8. Understand the wastes generated from construction and demolitions of building. What are the factors influencing creep?


MODULE - 4

1. Explain the uses of arches in foundation for alternatives wall construction.
2. Explain the use of composite masonry and confined masonry for alternative wall construction.
3. Explain the application and properties of Ferro cement.
4. Explain the application and properties of Ferro concrete building components.
5. Explain the concept of mivan construction.
6. Explain the concept of filler slabs
7. Explain the construction techniques of masonry vaults
8. Explain the construction techniques of domes

MODULE -5

1. Explain the machines used in manufacturing of concrete
2. Explain the equipments for production of stabilized blocks
3. Explain the moulds used in production of pre cast elements
4. Explain the concept of cost saving in building.
5. Explain the cost saving techniques in planning
6. Explain the cost saving design and construction
7. Explain the case studies of building using alternative materials
8. Write short note on RMC manufacturing and construction

Prepared by	Checked by		
			
Prof. S.M.Chandrakanth	Prof. Preethi R Patil	HOD	PRINCIPAL
		Civil Engineering	HIT, Nidasoshi
S.J.P.N.T's.HIT, Nidasoshi			

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Subject Title	PROJECT MANAGEMENT		
Subject Code	21ME651	IA Marks	50
Number of Lecture Hrs / Week	03	SEE	50
Total Number of Lecture Hrs	40	Exam Hours	03
CREDITS – 03			

FACULTY DETAILS:		
Name: Prof. N. T. Kambar	Designation: Asst. Professor	Experience: 05
No. of times course taught: 00	Specialization: Thermal Engineering	

1.0 Course Objectives

- To understand how to break down a complex project into manageable segments and use of effective project management tools and techniques to arrive at solution and ensure that the project meets its deliverables and is completed within budget and on schedule.
- To impart knowledge on various components, phases and attributes of a project.
- To prepare students to plan, develop, lead, manage and successfully implement and deliver projects within their chosen practice area.

2.0 Course Outcomes

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

- Understand the selection, prioritization and initiation of individual projects and strategic role of project management.
- Understand the work breakdown structure by integrating it with organization also the scheduling and uncertainty in projects.
- Understand risk management planning using project quality tools also the activities like purchasing, acquisitions, contracting, partnering and collaborations related to performing projects.
- Determine project progress and results through balanced score card approach.
- Draw the network diagram to calculate the duration of the project and reduce it using crashing.

3.0 Course Content


MODULE – 1

INTRODUCTION

Definition of project, characteristics of projects, understand projects, types of projects, scalability of project tools, project roles Project Selection and Prioritization–Strategic planning process, Strategic analysis, strategic objectives, portfolio alignment–identifying potential projects, methods of selecting projects, financial mode/scoring models to select projects, prioritizing projects, securing and negotiating projects. **08 hours**

MODULE 2

Planning Projects: Defining the project scope, Project scope check list, Project priorities, Work Breakdown Structure (WBS), Integrating WBS with organization, coding the WBS for the information system.

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Scheduling Projects: Purpose of a project schedule, historical development, how project schedules are limited and created, develop project schedules, uncertainty in project schedules, Gantt chart.

08 hours

MODULE 3

Resourcing Projects: Abilities needed when resourcing projects, estimate resource needs, creating staffing management plan, project team composition issues.

Budgeting Projects: Cost planning, cost estimating, cost budgeting, establishing cost control.

Project Risk Planning: Risk Management Planning, risk identification, risk analysis, risk response planning,

Project Quality Planning and Project Kickoff: Development of quality concepts, project quality management plan, project quality tools, kickoff project, baseline and communicate project management plan using

Microsoft Project for project baselines.

08 hours

MODULE 4

Performing Projects: Project supply chain management:-Plan purchasing and acquisitions, plan contracting, contact types, project partnering and collaborations, project supply chain management.

Project Progress and Results: Project Balanced Scorecard Approach, Internal project, customer, financial issues,

Finishing the project: Terminate project early, finish projects on time, secure customer feedback and approval, knowledge management, perform administrative and contract closure.

08 hours

MODULE 5

Network Analysis: Introduction, network construction - rules, Fulkerson's rule for numbering the events, AON and AOA diagrams; Critical path method (CPM) to find the expected completion time of a project, floats; PERT for finding expected duration of an activity and project, determining the probability of completing a project, predicting the completion time of project; crashing of simple projects.

4.0 Relevance to future subjects

Sl.No	Semester	Subject	Topics
01	VIII	Project work	Planning Projects, Scheduling Projects, Resourcing Projects, Budgeting Projects and Performing Projects.


5.0 Relevance to Real World

Sl.No	Real World Mapping
01	While working in an industry on project.

6.0 Gap Analysis and Mitigation

Sl. No	Delivery Type	Details
01	Tutorial	Topic: Agile Project Management
02	Tutorial	Topic: Project Manager
03	Tutorial	Topic: Human Factors and Project Team

7.0 Books Used and Recommended to Students

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Text Books
1 Project Management Timothy J Kloppenborg Cengage Learning Edition 2009 2 Project Management-A systems approach to planning scheduling and controlling Harold Kerzner CBS publication 3 Project Management S Choudhury McGraw Hill Education (India) Pvt. Ltd. New Delhi 2016
Reference Books
1 Project Management Pennington Lawrence McGraw Hill 2 Project Management A Moder Joseph and Phillips New York Van Nostrand Reinhold 3 Project Management, Bhavesh M. Patel Vikas publishing House
Additional Study material & e-Books
1. "Contemporary project management" by Timothy J Kloppenborg

8.0 Relevant Websites (Reputed Universities and Others) for Notes/Animation/Videos Recommended

Website and Internet Contents References
1) https://en.wikipedia.org/wiki/Project_management 2) https://www.manage.gov.in/studymaterial/PPM-E.pdf 3) https://www.scribd.com/document/475871105/FINAL-Word 4) https://www.planview.com/resources/guide/what-is-project-management/

9.0 Magazines/Journals Used and Recommended to Students

Sl.No	Magazines/Journals	website
1	Project management journal	https://journals.sagepub.com/toc/pmxa/current
2	International journal of project management	https://www.sciencedirect.com/science/article/pii/S0263786315001027
3	Complexity in project management	https://www.sciencedirect.com/science/article/pii/S1877050917323001
4	Project management planning and control	https://www.sciencedirect.com/book/9780081020203/project-management-planning-and-control

10.0 Examination Note


Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation:

Three Unit Tests each of 20 Marks (duration 01 hour)

- First test at the end of 5th week of the semester
- Second test at the end of the 10th week of the semester
- Third test at the end of the 15th week of the semester

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Two assignments each of **10 Marks**

- First assignment at the end of 4th week of the semester
- Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the Cos and Pos for

20 Marks (duration 01 hour)

- At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(To have less stressed CIE, the portion of the syllabus should not be common/repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods/question paper is designed to attain the different levels of Bloom's tax on my as per the outcome defined for the course.

Semester End Examination:

Theory SEE will be conducted by University as per the scheduled time table, with common question papers for the subject (**duration 03 hours**)

- The question paper will have ten questions. Each question is set for 20 marks. Marks scored shall be reduced proportionally to 50 marks
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module **Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks (duration 01 hour)**

- First test at the end of 5th week of the semester
- Second test at the end of the 10th week of the semester
- Third test at the end of the 15th week of the semester

Two assignments each of **10 Marks**

- First assignment at the end of 4th week of the semester
- Second assignment at the end of 9th week of the semester

Group discussion/Seminar/quiz anyone of three suitably planned to attain the Cos and Pos for

20Marks (duration01 hours)


- At the end of the 13th week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(To have less stressed CIE, the portion of the syllabus should not be common/repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

CIE methods/question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examination:


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Theory SEE will be conducted by University as per the scheduled time table, with common question papers for the subject (**duration 03 hours**)

- The question paper will have ten questions. Each question is set for 20 marks. Marks scored shall be reduced proportionally to 50 marks
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.

11.0 Course Delivery Plan

Module	Lecture No.	Content of Lecturer	% of Portion
Module 1:	1	Introduction to Project Management, Definition of project, characteristics of projects, understand projects	20
	2	types of projects, scalability o project tools	
	3	project roles Project Selection and Prioritization – Strategic planning process	
	4	Strategic analysis, strategic objectives	
	5	portfolio alignment – identifying potential projects	
	6	methods of selecting projects	
	7	financial mode / scoring models to select projects	
	8	Prioritizing projects, Securing and negotiating projects.	
Module 2:	9	Planning Projects: Defining the project scope, Project scope checklist	20
	10	Project priorities, Work Breakdown Structure (WBS)	
	11	Integrating WBS with organization, coding the WBS for the information system.	
	12	Scheduling Projects: Purpose of a project schedule	
	13	historical development, how project schedules are limited and created	
	14	develop project schedules	
	15	uncertainty in project schedules	
	16	Gantt chart.	
Module 3:	17	Resourcing Projects: Abilities needed when resourcing projects, estimate resource needs	20
	18	creating staffing management plant, project team composition issues	
	19	Budgeting Projects: Cost planning, cost estimating	
	20	Cost budgeting, establishing cost control.	
	21	Project Risk Planning: Risk Management Planning, risk identification, risk analysis, risk response planning	
	22	Project Quality Planning and Project Kick off: Development of quality concepts, project quality management plan	
	23	project quality tools, kick off project, baseline and	
	24	Communicate project management plan using Microsoft Project for project baselines.	
Module 4:	25	Performing Projects and Project supply chain management: - Plan purchasing and acquisitions, plan contracting	20
	26	Contact types, project partnering and collaborations, project supply chain management.	
	27	Project Progress and Results: Project Balanced Scorecard Approach	
	28	Internal project, customer, financial issues	
	29	Finishing the project: Terminate project early, finish projects on time	
	30	secure customer feedback and approval	
	31	Knowledge management	
	32	Perform administrative and contract closure.	

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Module 5:	33	Network Analysis: Introduction	20
	34	network construction - rules	
	35	Fulkerson's rule for numbering the events, AON and AOA diagrams	
	36	Critical path method (CPM) to find the expected completion time of a project floats	
	37	PERT for finding expected duration of an activity and project	
	38	determining the probability of completing a project	
	39	predicting the completion time of project	
	40	Crashing of simple projects.	

12.0 Assignments, Pop Quiz, Mini Project, Seminars

Sl.No.	Title	Outcome expected	Allied study	Week No.	Individual / Group activity	Reference: book /website /Paper
1	Assignment 1:	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 1 & 2 of the syllabus	4	Individual Activity.	Books 1, 2 and 3 of the text book list
2	Assignment 2:	Students study the Topics and write the Answers. Get practice to solve university questions.	Module 3,4 & 5 of the syllabus	9	Individual Activity.	Books 1, 2 and 3 of the text book list


13.0 QUESTION BANK

Module 1

1. What is a project?
2. What is project management?
3. What types of constraints are common to most projects?
4. Which deliverable authorizes the project team to move from Selecting & Initiating to Planning?
5. At what stage of a project life cycle are the majority of the "hands-on" tasks completed?
6. What are the five process groups of project management?
7. What are the 10 project management knowledge areas?
8. What two project dimensions are components of project performance?
9. How do you define project success?
10. How do you define project failure?
11. List four common causes of project failure.
12. What are three common ways of classifying projects?
13. List and describe each step in the strategic planning process.
14. Name five things that may be negotiated between a client company and a contractor company
15. What are some common reasons for project failure?

Module 2

1. List three reasons why understanding stakeholder is important to successful project management.
2. What is the difference between an internal and external stakeholder?
3. Which three criteria should you consider when prioritizing stakeholders?
4. Describe an AGILE "stand-up" meeting.
5. What three tasks comprise the "define scope" process?
6. Why is scope definition important?
7. What are two common causes of scope creep?

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8. What does the acronym WBS stand for?
9. What are the advantages of using a WBS?
10. List three ways of organizing a WBS.
11. The lowest level of the WBS is known as?
12. What items are typically included in a work package description?
13. What is rolling wave planning?
14. What is uncontrolled change known as?
15. Why do project teams use change control systems?
16. List the major sections that should be included in a change request form, and tell why each is important.
17. When can the first draft of a project schedule be constructed?
18. What is the difference between an activity and a work package?
19. How can a **Gantt chart** be helpful in project planning?

Module 3

1. In addition to technical skills, what other skill must a project manager have in order to successfully resource a project?
2. Why is it important to involve workers in the planning phase of a project when possible?
3. What are two techniques used to compress a project schedule?
4. When crashing a project, what two criteria are considered when deciding which activities to speed up?
5. What type of costs does not depend on the size of a project?
6. During which phase of a project do recurring costs typically occur?
7. What are some examples of expedited costs?
8. What is the purpose of an order of magnitude cost estimate?
9. What is the “time value of money,” and why is it relevant to project management?
10. For a routine project, what is a typical percentage of total project costs that should be placed into contingency reserves? For an unusual project?
11. Should a project manager alone identify potential risks for the project? Why or why not?
12. During which stage of a project are most risks typically uncovered?
13. Are both qualitative and quantitative risk analyses used on all projects? Why or why not?
14. What is an example of transferring risk?
15. In the risk register, why should only one person be assigned “owner” of a risk?
16. Identify similarities and differences among TQM, ISO, and Six Sigma. What strengths and weaknesses are inherent in each of these approaches?
17. Discuss the areas of ISO. Which do you feel is most important and why?
18. Describe the process of achieving stakeholder satisfaction. Why is it important to consider stakeholder satisfaction?
19. Describe the three outputs of quality control.
20. List the project quality tools you expect to use on your project. Tell where you plan to use each tool and why it is important.

Module 4

1. Do small businesses often outsource project work? Why or why not?
2. Which is the first of the four processes that make up project procurement management?
3. In supply chain management, what are some other names for the seller? What are some other names for the buyer?
4. List three functional areas that are frequently outsourced by business organizations.
5. What are some potential issues related to outsourcing?
6. What are four potential information sources that organizations can use to identify potential sellers?
7. Describe two methods that can be used to evaluate potential suppliers.
8. What items are generally included in a request for proposal?
9. What is the primary reason for determining project progress and results?
10. Which five aspects of project success are evaluated in the balanced scorecard approach?
11. Give three categories of internal project issues and an example of each.
12. In addition to the WBS, what might trigger project work to be authorized and performed?



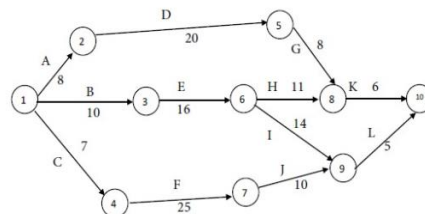
13. What is an advantage of letting workers self-control their work?
14. How does one calculate schedule variance?
15. What does cost performance index (CPI) measure?
16. When does a project move into the closing stage?
17. What is validate scope?
18. What is the purpose of a “punch list”?
19. What should a project manager refer back to in order to make sure that all planned work has, in fact, been completed?
20. When might a contract clause be invoked?
21. If an early termination of his project seems likely, what two avenues can a project manager explore to increase the likelihood of being able to continue the project?

Module 5

1. What is network analyses? Write its salient feature.
2. Define following
 - i) Pert
 - ii) CPM
3. How 20 key project manager actions are organized? Explain.
4. What is material requirement planning (MRP)? define it with suitable example
5. How MRP is a ‘push’ system while JIT is a ‘pull’ system? explain it
6. Determine the critical path, the critical activities and the project completion time
 The following details are available regarding a project:

Activity	Predecessor Activity	Duration (Weeks)
A	-	3
B	A	5
C	A	7
D	B	10
E	C	5
F	D,E	4

7. Find out the completion time and the critical activities for the following project:



8. Draw the network diagram and determine the critical path for the following project



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Activity	Time estimate (Weeks)
1- 2	5
1- 3	6
1- 4	3
2- 5	5
3- 6	7
3- 7	10
4- 7	4
5- 8	2
6- 8	5
7- 9	6
8- 9	4

9. Develop a network diagram for the project specified below

Activity	Immediate Predecessor Activity
A	-
B	A
C, D	B
E	C
F	D
G	E, F

14.0 University Result

New scheme subject

Prepared by	Checked by		
Prof. N. T. Kambar	Prof. M A Hipparagi	HOD	Principal
Course coordinator	Module coordinator		



Subject Title	COMPUTER AIDED DETAILING OF STRUCTURES		
Subject Code	21CVL66	CIE Marks	50
Number of Lecture Hrs /	0:0:2	SEE Marks	50
Total Number of Lecture Hrs	1	Exam Hours	03
CREDITS – 01			

FACULTY DETAILS:		
Name: Prof. S. V. Jore	Designation: Asst. Professor	Experience: 2 Years
No. of times course taught: 02	Specialization: Construction Technology and Management	

1.0 Prerequisite Subjects:

Sl.No	Branch	Semester	Subject
01	Civil Engineering	III	Computer Aided Building Planning and Drawing

2.0 Course Objectives

Course Learning Objectives:

This course will enable students to:

1. Be aware of the scale factors, sections of drawings
2. Draft the detailing of RC and Steel Structural member

3.0 Course Outcomes

Having successfully completed this course, the student will be able to:

Sl.No	Course Outcome	RBT Level	POs
CO1	Prepare the detailed working drawings of RC structural elements	L1,L2,L3,L4	1,2,3,5,6,8,12
C02	Prepare the detailed working drawings of Steel structural elements	L1,L2,L3,L4	1,2,3,5,6,8,12

4.0 Course Content

MODULE-01

1. Beams
 - i. Simply supported beam
 - ii. Cantilever beam
 - iii. Continuous beam



2. Slabs
 - i. One-way slab
 - ii. Two-way slab
 - iii. One-way continuous slab
3. Staircases
 - i. Dog legged staircase
 - ii. Open well staircase
4. Footing
 - i. Isolated footing
 - ii. Combined footing
5. Cantilever retaining wall

MODULE-02

1. Connections
 - i. Beam to beam by bolted connections
 - ii. Beam to beam by welded connections
2. Connections
 - i. Beam to beam by bolted connections
 - ii. Beam to beam by welded connections
3. Built-up columns
 - i. Built-up column with lacings
 - ii. Built-up column with battens
4. Gusseted base and Column base with bolted and welded connection
5. Roof truss- Welded and bolted

5.0 Relevance to future subjects

SI No	Semester	Subject	Topics
1.	VII	Software Applications Laboratory	Structural Analysis

6.0 Relevance to Real World

SI No	Real World Mapping
01	Students will be able to prepare the detailed working drawings of various structures

7.0 Books Used and Recommended to Students

Reference Books
1. SP 34: Handbook on Concrete Reinforcement and Detailing, Bureau of Indian Standards.
2. IS 13920, Ductile Design and Detailing of Reinforced Concrete Structures Subjected to Seismic Forces -Code of Practice, Bureau of Indian Standard
3. N Krishna Raju, "Structural Design and Drawing of Reinforced Concrete and Steel", University Press
4. Krishna Murthy, "Structural Design and Drawing-Concrete Structures". CBS Publishers, New Delhi
Additional Study material & e-Books
Class notes and vtU notes



S J P N Trust's Hirasugar Institute of Technology, Nidasoshi. <i>Inculcating Values, Promoting Prosperity</i> Approved by AICTE, Recognized by Govt. of Karnataka and Affiliated to VTU Belagavi. Recognized Under Section 2(f) of UGC Act, 1956. Accredited at 'A' Grade by NAAC, Programmes Accredited by NBA: CSE, ECE, EEE& ME.	Civil Engg. Dept Academic Course Plan 2023-24 (Odd Sem)
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09.0 Examination Note

Assessment details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each course. The student has to secure not less than 35% (18 Marks out of 50) in the semester-end examination (SEE).

Continuous Internal Evaluation (CIE):

CIE marks for the practical course is 50 Marks.

The split-up of CIE marks for record/ journal and test are in the ratio 60:40.

- Each experiment to be evaluated for conduction with observation sheet and record write up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments designed by the faculty who is handling the laboratory session and is made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to 30 marks (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct 02 tests for 100 marks, the first test shall be conducted after the 8th week of the semester and the second test shall be conducted after the 14th week of the semester.
- In each test, test write-up, conduction of experiment, acceptable result, and Procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability. Rubrics suggested in Annexure-11 of Regulation book
- The average of 02 tests is scaled down to 20 marks (40% of the maximum marks). The Sum of scaled-down marks scored in the report write-up/journal and average marks of two tests is the total CIE marks scored by the student.

Semester End Evaluation (SEE):

- SEE marks for the practical course is 50 Marks.
- SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the University
- All laboratory experiments are to be included for practical examination. (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. OR based on the course requirement evaluation rubrics shall be decided jointly by examiners
- Students can pick one question (experiment) from the questions lot prepared by the internal /external examiners jointly.
- Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.
- General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)
- Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.
- The duration of SEE is 03 hours
- Rubrics suggested in Annexure-II of Regulation book







10.0 Course Delivery Plan

Expt No	Name of the Experiment	% of Portion
1	Beams i. Simply supported beam ii. Cantilever beam iii. Continuous beam	10
2	Slabs i. One-way slab ii. Two-way slab iii. One-way continuous slab	10
3	Staircases iii. Dog legged staircase iv. Open well staircase	10
4	Footing i. Isolated footing ii. Combined footing	10
5	Cantilever retaining wall	10
6	Connections i. Beam to beam by bolted connections ii. Beam to beam by welded connections	10
7	Connections i. Beam to beam by bolted connections ii. Beam to beam by welded connections	10
8	Built-up columns i. Built-up column with lacings ii. Built-up column with battens	10
9	Gusseted base and Column base with bolted and welded connection	
10	Roof truss- Welded and bolted	

11.0 Question bank

1. What is the application of CADs?
2. Define absolute co-ordinates
3. Define angular dimension
4. How to define mirror?
5. How to detail the structure?
6. What is the default position of UCS system?
7. What are the details that a typical set of mechanical working drawings?
8. How a text used on a typical detail sheet should be aligned?

Prepared by	Checked by		
			
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