

# SRI MANAKULA VINAYAGAR

ENGINEERING COLLEGE



8<sup>th</sup> UG - Board of Studies Meeting in the department of Civil Engineering

for the programme

B.Tech – Civil Engineering

Venue
Seminar Hall
Sri Manakula Vinayagar Engineering College
Madagadipet, Puducherry – 605 107

04.09.2024 at 03.00 pm

I

#### Item No. 08 : BoS / UG / CIVIL 8.8

To apprise and approve the Academic Calendar for odd Semester 2024 - 2025

- i) Quality Circle Meeting (QCM)
- ii) Continuous Assessment Test (CAT)
- iii) Model Exam and End Semester Examination
- iv) Redo / Discontinue students.

#### ITEM No.9: BoS / UG/ CIVIL 8.9

To apprise and approve the End Semester Examinations July 2024 Results and Graduation details of the batch 2020-2024 students under Regulation 2020.

#### Item No. 10 : BoS / UG / CIVIL 8 .10

To apprise and approve the Industry Institute Interaction

- i) Guest Lecture/Seminar/ Workshop
- ii) Industrial Visit
- iii) Internship
- iv) Value Added Courses
- v) Student Achievements

#### Item No. 11 : BoS / UG / CIVIL 8 .11

To apprise the members on the training activities conducted for Placement for the batch 2021-2025.

#### Item No. 12 : BoS/ UG / CIVIL 8.12

To apprise and approve the Department Research activities

- i) Publications
- ii) Ph.D Full time/ Part time program progress

#### Item No. 13: BoS / UG / CIVIL 8 .13

To discuss and approve the panel of examiners

#### Item No. 14: BoS / UG / CIVIL 8.14

Any other item with the permission of chair

Dr.S.Sundararaman

Chairperson - BoS

#### **AGENDA OF THE MEETING**

#### Item No. 1: BoS/UG/CIVIL 8.1

Welcome Address by BoS Chairperson.

#### Item No. 2: BoS/UG/CIVIL 8.2

Review and confirm of 7th BoS Minutes of Meeting.

#### Item No. 3: BoS/UG/CIVIL 8.3

To apprise on the curriculum structure of Regulation 2023 for I to IV Semesters.

#### Item No. 04: BoS/UG/CIVIL 8.4

To discuss and approve the R2023 curriculum and syllabi for V & VI Semester under Regulation 2023 for B.Tech. Civil Engineering.

#### Item No. 05 : BoS / UG / CIVIL 8.5

To discuss and approve on the Curriculum and syllabus related to award of Honours/Minors Degree under Regulation 2023.

#### Item No. 06: BoS/UG/CIVIL 8.6

To apprise and approve the following chosen Elective Courses,

- i) Professional Elective courses for V & VII Semester under Regulation 2020 for the batches 2022 2026 and 2021-2025
- ii) Open Elective courses for V & VII Semester under Regulation 2020 for the batches 2022 2026 and 2021-2025.

#### Item No. 07: BoS/UG/CIVIL 8.7

To apprise and approve on the following chosen Employability Enhancement Courses, mandatory course and Certificate course

- Skill Enhancement courses for III semester under Regulation 2023 for batch 2023 - 2027 and Skill Development courses for V semester under Regulation 2020 for the batches 2022 -2026.
- ii) Mandatory Courses for III semesters under regulation 2023, and mandatory courses for V & VII semesters under regulation 2020
- iii) Certificate courses for III Semester under Regulation 2023 for the Batch 2023-2027 and for V semester under Regulation 2020 for the batch 2022-2026.
- iv) NPTEL / MOOC & online certification courses of batches 2023 2027 and 2022-2026.

Department of Civil Engineering

#### Minutes of the Meeting

Dr. S.Sundararaman, Chairperson, BoS opened the meeting by welcoming and introducing the external members, to the internal and co-opted members and thanked them for valuable presence in this 8<sup>th</sup> Board of Studies and the meeting thereafter deliberated on agenda items that had been approved by the Chairperson.

		The state of the s					
Item No. 1: BoS / UG / CIVIL 8.1	highlig Repres	The Chairperson declared the meeting open and welcomed all the members. He highlighted on the group of colleges in SMVE Trust with the names of Management Representatives & Director cum Principal. The Vision and Mission Statement of the Institution and the Department was also apprised to all the members present in the meeting.					
	confirm	ned with the approval for the incorp	s of 7 <sup>th</sup> BoS, its implementation and then it is poration of minor revisions needed as mentioned				
	S.No	Suggestions	Action Taken				
Item No. 2 : BoS / UG /	2	Suggestion given not to use course titles with Part I and II such as Mechanics of solids-I & II, Geotechnical Engineering – I & II.  To include Artificial Intelligence and Data analytics in the higher semester of the existing civil Engineering courses.	As the mechanics of solids - I course was already approved in the 6th BoS and the End Semester was completed and grade sheets were issued the continuation of the course namely Mechanics of solids – II is retained.  However courses Geotechnical I and II are renamed as soil mechanics and Foundation Engineering respectively.  As suggested, for the regulation 2020 of batch 2021-2025 the open elective "IoT and its applications" was chosen by the				
CIVIL 8.2			students. For the batch of regulation 2023 in the higher semesters, Open elective such as Essentials of Data Science, Principle of Artificial Intelligence and Machine Learning, Artificial Intelligence, Data Science using Python, Data Science Application of NLP, Artificial Intelligence applications are offered from IV to VII Semesters.				
	3	Project work alone can be in the Eight semester rather than 3 Theory courses and a Project work. This will make the final year students to for internship program or employment opportunity.	It was decided to have 3 theory courses along with a project in the 8 <sup>th</sup> semester for all the undergraduate courses in the institution. However, there is a plan to complete the syllabus as per the allotted hours and permit the students for internship and project works.				
	4	Suggested that instead of	It was decided to have common computer				
	* "	having a separate course for computer-oriented programs	oriented courses for all Undergraduate programs, so that students can have a				

		there can be a course with a title "Program for Problem solving" which can have the python and C Programming	chance to incorporate the coding skills in their respective domains.
	5	Course on Research methodology is not needed and insisted to have a core course in VI semester	In order to instill and enhance the creativity and innovation amongst the students, there is a course on Design thinking and idea lab in first semester. Also, the micro and mini projects in V and VII Semester will be an added advantage for making the idea to product. The course Research Methodology will help the students to have an in depth attraction towards innovation and hence retained.
	6	Change of title in the internship course floated in the 7 <sup>th</sup> semester to Community Connect so as to serve the community as a Civil Engineering profession.	A common course title of Internship has been retained so as to serve the purpose of both technology as well as community connect.
	7	Building Material and Construction can be renamed as Building Materials inbuilt Environment	This course was approved in the 6 <sup>th</sup> BoS meeting and students have already completed their end semester examination. Hence renaming of this course will be done in the next regulation.
	8	Renaming the course of Construction Management in 7th semester to Construction Technology and Management so that student can have the knowledge on technology as well management techniques.	The course is renamed to Construction Techniques and Management and the syllabus will be placed before the members in the 9 <sup>th</sup> BoS Meeting.
	9	Building Information Modeling is one of the emerging technologies and more job opportunities are flourishing the same can be incorporated in International Certificate Course	As the International Certification courses are handled by third party, it is insisted to see the feasibility of including Building Information Modeling course. The work is in progress for approval.
	(The do	etails of suggestion and action ta	aken of the meetings is attached in Annexure
Item No.3:	Chairpe	erson BoS, Apprised on the Regul	ations and curriculum structure of Regulation
BoS/UG/	2023 fc	or I to IV Semesters.	
CIVIL 8.3	(The de	etails of R23, Curriculum I to IV	Semesters is attached in Annexure II).

Item No. 4:					egulation, curri		adi tor V & VI		
AND DESCRIPTION OF THE PARTY OF					ech. Civil Engine		or der had		
BoS/UG/	(The de	etails related	to Curri	culum and	Syllabus for V	& VI Semesters	s of Regulation		
CIVIL 8.4	2023 is	attached in A	nnexur	e III).					
					profiles and	Ligitativa			
	Discuss	ed and appro	ved on t	he Curricu	lum and syllabu	s related to aw	ard of Honours		
Item No. 5:	Minors degree under Regulation 2023.								
BoS / UG /	(The details of syllabus related to award of Honours/Minors Degree under								
CIVIL 8.5	Regula	tion 2023 is a	ttached	in Annexu	ıre IV).				
						A PET PA			
	. 21				wing chosen Ele	ective Courses	and the same		
		proved by the							
					V & VII Semeste	er under Regula	ation 2020 for		
	the batches 2022 – 2026 and 2021-2025								
	II. Open Elective courses for V & VII Semester under Regulation 2020 for the								
		batches 2022	<b>– 2026</b> :	and 2021-2	025.				
	S.No	Regulation	Sem	Batch	Category	Course code	Course Name		
Item No. 6: BoS / UG /	1	2020	V	2022- 2026	Professional Elective	U20CEE506	Ground Improvement Techniques		
CIVIL 8.6				0004	Professional		Site		
CIVIL 8.6	2	2020	VII	2021 - 2025	Elective	U20CEE716	Investigation Methods and Practices		
CIVIL 8.6	3	2020	VII		A CONTRACTOR OF THE PROPERTY O	U20CEE716 U20HSO504	Methods and		

Discussed and approved the following chosen Skill Development Courses & Certification Course for B.Tech. Civil Engineering program.

- Skill Enhancement courses for III Semester under Regulation 2023 for Batch 2023 - 2027 and Skill Development Courses for V semester under Regulation 2020 for the Batch 2022 -2026.
- II. Mandatory Courses for III Semester under Regulation 2023, and Mandatory courses for V & VII Semesters under Regulation 2020.
- III. Certificate courses for III Semester under Regulation 2023 for the Batch 2023-2027 and for V Semester under Regulation 2020 for the Batch 2022-2026.

S.No	Regulation	Sem	Batch	Category	Course code	Course Name
1	2023	III-	2023 - 2027	Skill Development Course	U23CES301	Basic Vasthu
2	2020	٧	2022 - 2026	Skill Development Course	U20CES504	Career and professional Skill Development program 1
3	2020	V	2022 - 2026	Skill Development Course	U20CES505	Presentation Skills Using ICT
4	2023	Ш	2023- 2027	Chosen Mandatory Courses	U23CEM303	Climate Change
5	2020	V	2022- 2026	Chosen Mandatory Courses	U20CEM505	Indian Constitution
6	2020	VII	2022- 2025	Chosen Mandatory Courses	U20CEM707	Professional Ethics
7	2023	III	2023 - 2027	Certification Course	U23CEC360	Total Station
8	2020	٧	2022 - 2026	Certification Course	U20CEC585	STAAD PRO V8i

Item No. 7: BoS / UG / CIVIL 8.7

Discussed and approved the B.Tech. degree NPTEL / MOOC & online certification courses of Batches 2023 – 2027 and 2022-2026.

(The list of Skill Development Courses and syllabi for the chosen course, list of Certification Course and List of NPTEL / MOOC has been attached in Annexure VI)

Discussed and approved the B.Tech. Degree Academic Calendar for Odd Semester 2024 -2025. The board Chairperson apprised on the schedule for Quality Circle Meeting (QCM), Continuous Assessment Test (CAT), Model Exam and End Semester Examination before the committee. The Redo & Discontinue students' details also apprised to the members.

#### a) Quality Circle Meeting (QCM)

QCM / Year	II Year	III Year	IV Year
QCM - 1	22.08.2024	22.08.2024	22.08.2024
QCM - 2	25.09.2024	25.09.2024	25.09.2024
QCM - 3	18.10.2024	18.10.2024	18.10.2024

b) Continuous Assessment Test (CAT)

Item No. 8: BoS / UG / CIVIL 8.8

CAT/Year	II Year	III Year	IV Year
CAT – 1	26.08.2024	26.08.2024	26.08.2024
CAT - 2	27.09.2024	27.09.2024	27.09.2024

#### c) Model Exam and End Semester Examination

Particulars	II Year	III Year	IV Year
Model Exam	21.10.2024	21.10.2024	21.10.2024
Model Practical	28.10.2024	28.10.2024	28.10.2024
End Semester Practical Exam	04.11.2024	04.11.2024	04.11.2024
End Semester Exam	11.11.2024	11.11.2024	11.11.2024

#### d) Redo / Discontinue students

S.No	Name of the Student	Reg. No	Year/Sem	Category
	10	Nil		

Discussed and approved the End Semester Examinations July 2024 Results and Graduation details of the batch 2020-2024 students under regulation 2020.

Item No. 9: BoS/UG/ CIVIL 8.9

Batch	Year/Semester	No. of Student Appeared	No. of Student Passed	Pass percentage (%)
Regulation	2023	Set 1 1	- 1 - 1 - 1	
2023-2027	1711	26	13	50.00
Regulation	2020	26.5		100
2022-2026	II / IV	12	06	50.00
2021-2025	III / VI	29	23	79.31
2020-2024	IV / VIII	39	37	98.68

	Batch	No. of Student	First Class with Distinction	First Class	Second Class	Not yet to be clear	Graduated percentage (%)
	Regulati	ion 2020			100 to 101 to	10 - 10	
	2020- 2024	39	07	27	01	03	35/39 = 89.7%
					- 4		
Item No. 10: BoS / UG / CIVIL 8.10	& 3 value technolog Apart fron	added cours y in the field	se have been org I of civil enginee tudent's underw	ganized to	all the stude	ents and ur	Seminar/ Workshop nderstand the lates t companies and 6
	V 1 4 4 5	nt for the bat	ch 2021-2025.	members Program	No.of St	udents	ities conducted fo
item No. 11 : BoS / UG		Company nnate Talent Vext		ESCH LECTE	Atten 24		03.06.2024 to 14.06.2024
/ CIVIL 8.11		Consensus	C Program	m	24		22.07.2024 to 01.08.2024
	3 F	ace Acaden	ny Aptitude / Reasonin		24	11	02.09.2024 to till now
	4 Ir	nnate Talent	Aptitude	Aptitude			02.09.2024 to till
	l N	Vext					now
Item No.12 : BoS / UG / CIVIL 8.12	a) Board 15 pa b) Discu	I Chairperso pers in intern ssed and a	n apprised the n	nces & jou e details o	nat the facul rṇals for the of the Ph.D	Ity & stude	ents have published by year 2023 – 2024 ed candidates and
: BoS / UG / CIVIL	a) Board 15 pa b) Discu prese	I Chairperso pers in intern ssed and a nted their pr	n apprised the national confere	nces & jou e details o search ac	nat the facul rṇals for the of the Ph.D tivities carrie	Ity & stude academic registered ad out so f	ents have publishe c year 2023 – 2024 ed candidates an

#### 8th BoS Minutes of Meeting

Item No. 14 : BoS / UG / CIVIL 8.14

- Members suggested that for the course Design of Steel Structures, Unit I can be split into 2 units namely bolted and welded connections, Unit- III can have the tension members and the IV and V unit can be with compression members and design of beams respectively.
- In the panel of Examiner list the criteria for selection of examiners can alone be presented instead of the specialization and college/ University Name.
- It is also suggested by industrial expert to Incorporate Building Services Engineering as one of the core paper or elective paper which will be of more important for students getting jobs in future.

The Meeting was concluded with vote of thanks by Dr.S.Sundararaman, Head of the Department, Department of Civil Engineering.

Dr. S.Sundararaman

Chairperson - BoS
Dr.S. SUNDARARAMAN, M.Tech., Ph.L...

Professor & Head Department of Civil Engg

Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India Dr.S. SUFBARARABARA, alection Drofessor & Head
Department of Civil Enga
Set Manarula showard Enga Carear
set equated Fuduriany, and

SI.N	and official Address	Members as per UGC norms	Signature
1	Dr. S.Sundararaman Professor and Head Department of Civil Engineering, SMVEC, Madagadipet – 605107.	Chairman	C.R
2	Dr.K.Baskar Professor, National Institute of Technology, Tiruchirappalli	Subject Expert (Pondicherry University Nominee)	6.40
3	Dr. P. T. Ravichandran Professor & Head, Department of Civil Engineering, Faculty of Engineering and Technology, SRM Institute of Science and Technology, Kattankulathur	Subject Expert (Academic Council Nominee)	Realis
4	Dr. A. Latha Professor Department of Civil Engineering Panimalar Engineering College Chennai.	Subject Expert (Academic Council Nominee)	Hate
5	Dr. K. Srinivasamoorthy, Professor, Department of Earth Science, Pondicherry University, Puducherry – 605014	Subject Expert (Academic Council Nominee)	1. Sirinas youthy
6	Dr. S. Virapan Chairman & Managing Director Sanvir Associates Chennai	Industry Representative	With
7	Er. K.Surya, (Alumni) Er. Surya Civil Engineering & Contractor Pudhucherry.	Alumni	K. Suryo
8	Dr.S.Jayakumar Controller of Examinations Professor in Civil Engineering SMVEC, Madagadipet - 605107	Internal Members	X.
9	Mr.J.Subash Chandra Boss Assistant Professor Department of Civil Engineering SMVEC, Madagadipet - 605107	Internal Members	Lugud
10	Mrs.A.Kalyani Assistant Professor Department of Civil Engineering SMVEC, Madagadipet - 605107	Internal Members	S. Llye
1	Mr.C.Raj Govind Assistant Professor Department of Civil Engineering SMVEC, Madagadipet - 605107	Internal Members	Luy
	Mr.K.Srinivasan Assistant Professor Department of Civil Engineering SMVEC, Madagadipet - 605107	Internal Members	Ka
3	Mrs.S.Banupriya Assistant Professor Department of Civil Engineering SMVEC, Madagadipet – 605107	Internal Members	A

r 1. V 5.107

٠٠. ٤٠٠٠:

	(2.1)		
	Mr.S.Sivaprasath Assistant Professor		Ma as as
14	Department of Child Towns (1)	Internal Members	A A A
30-1 10	Department of Civil Engines (1)	Internal Members	9901
	SMVEC, Madagadipet - 6051 Ms.G.Yamuna		
	Accident Dest		hu.
15	Assistant Professor	Internal Members	do stand
	Department of Civil Engineering	internal Wembers	111. N 9
	SMVEC, Madagadipet - 60 742		
	Mrs.K.Nivedita		
16	Assistant Professor	Internal Members	010
	Department of Civil Engine	internal Wembers	\.\.\.
	SMVEC, Madagadipet - 853		I manual of
	Mrs.D.Sathiyasree		
17	Assistant Professor		1 22
	Department of Civil Engin	Internal Members	10: hr x
	SMVEC, Madagadipet - 505		10
	Mr.G.Senthilraj		
18	Assistant Professor		I we
10	Department of Civil Engineering	Internal Members	Do. W
	SMVEC, Madagadipet - 635107		UV
	Ms.B.Pallavi		1 2
40	Assistant Professor		O Pri
19	Department of Civil Engineering	Internal Members	63/
	SMVEC, Madagadipet - 605127		1//
	Mr.R.Badhrinadhan		
	Assistant Professor		THE PROPERTY OF
20	Department of Civil Engineering	Internal Members	1) Ralogia
	SMVEC, Madagadipet - 603.77		J. Wooling
	Mrs.S.Sinthanagorky		
	Assistant Professor		A.
21	Department of Civil Engineering	Internal Members	(Xmtrauhi)
	SMVEC, Madagadipet - 603:17		DIMMONALA
	Mr.S.Tiroumalai		<u> </u>
	Assistant Professor	ALL LAND SEE SEEL SEELS	1
22	Department of Civil Engineering	Internal Members	James 1
	SMVEC, Madagadipet - 605:07		90.
	Mrs.V.Sivasankari		- J.
-	Assistant Professor		
23	Department of Civil Engineering	Internal Members	1. James
	SMVEC, Madagadipet - 605107		11-110
	Mr.G.Anandhanarayanan 15/107		*
	Assistant Professor	100000000000000000000000000000000000000	11 1
24		Internal Members	Managanalina
	Department of Civil Engineering		A. M. M. C.
	SMVEC, Madagadipet - 605107		-
	Mr.S.Manikandan	A STATE A Local	
	Assistant Professor		
25	Department of Civil Engineering	Internal Members	-01.1
	SMVEC, Madagadipet - 605107	internal Members	(S. My)
			7
	Mr.V.Murugappan		
26	Assistant Professor	Internal Members	121.111
ance.	Department of Civil Engineering	internal wembers	1 V-M7+7
10.0	SMVEC, Madagadipet - 605107		
	Ms.J.Jayapriya		
	Assistant Professor		
27	Assistant Professor	Internal Members	The V
27		Internal Members	Jany

28	Mr.MCK.Jamenraja Assistant Professor Department of Civil Engineering SMVEC, Madagadipet - 605107	Internal Members	OR THE
29	Mr. K. Raja Associate Professor Department of Mathematics SMVEC, Madagadipet - 605107	Internal Members	B. My
30	Dr.K.Kathikeyan Associate Professor Department of Chemistry SMVEC, Madagadipet - 605107	Internal Members	Dis Descont
31	Dr.P.Rajeswari Associate Professor Department of English SMVEC, Madagadipet - 605107	Internal Members	P. Raj
32	Dr. K. Samuel Assistant Professor Department of Physics SMVEC, Madagadipet - 605107	Internal Members	The animaly

# **ANNEXURE II**

# II BAUKBINA



# SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE

(An Autonomous Institution)

Puducherry

# B.TECH. CIVIL ENGINEERING

ACADEMIC REGULATIONS 2023 (R - 2023)

CURRICULUM



Academic Curriculum 2023 (R-2023)

#### **COLLEGE VISION AND MISSION**

#### Vision

To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

#### Mission

#### **MI: Quality Education**

To provide comprehensive academic system that amalgamates the cutting edge technologies with best practices.

#### M2: Research and Innovation

To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

#### M3: Employability and Entrepreneurship

To inculcate the employability and entrepreneurial skills through value and skill based training.

#### M4: Ethical Values

To instill deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

Dr.S. SUNDARARAMAN, M.Tech., Pr. .:

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. College

Department of Civil Engg

#### DEPARTMENT VISION AND MISSION

#### Vision

We envision a world where the civil engineering department will be a home to an intellectual community with good quality education embedded with practical knowledge by inculcating research, strong social commitment and ethical values from its students, staffs and alumni.

#### Mission

#### M1: Quality Education

To fulfill the requirements of construction industry, Civil Engineering profession and rural community through dissemination of technical services.

#### M2: Practical Knowledge

To impart quality and real-time education to the students with the knowledge & skills needed for Civil Engineering practice

#### M3: Work Efficiency

To encourage research, development and consultancy through sustained interaction with industry & research organization.

#### M4: Societal issues

To develop graduates to compete at the global level to deal with modern issues.

#### M5: Moral & Ethical

To insist ethical values and professionalism among the students.

Dr.S. SUNDARARAMAN, M.Tech., Pa.z.

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puduchery, India Department of Civil Engineering

2.0.7.18

#### PROGRAMME OUTCOMES (POs)

#### PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

#### PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

#### PO3: 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.

#### PO4: 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.

#### PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

#### PO6: 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.

#### PO7: 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.

#### PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

#### PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

#### PO10: 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.

#### PO11: 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.

#### PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Dr.S. SUNDARARAMAN, M.Tech., P.
Professor & Head

Dipararamenti of Engiritedings
Sri Manakula Vinayagar Enea. College

2.A.7.19

### PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

#### PEO1: Fundamental Knowledge

To gain a thorough fundamental knowledge, problem solving skills, engineering experimental abilities, and design capabilities for a civil engineering career.

#### PEO2: Knowledge and Skills

To establish the knowledge and skills necessary for identifying and assessing design alternatives and the related social, economic, environmental, and public safety impacts.

#### PEO 3: Societal Implications

To develop the ability to deal effectively with ethical and professional issues, taking into account the broader societal implications of civil engineering

#### **PEO 4: Competent Professionals**

To create competent professionals who are trained in the design and development of Civil Engineering systems to engulf research and development activities

## PROGRAM SPECIFIC OUTCOMES (PSOs)

#### **PSO 1: Practical Knowledge**

Inculcating practical knowledge in planning, analysis, design and construction management without much exploiting natural resources.

#### **PSO 2: Critical Thinking**

超過日本知過過 物性 鄉門等以出行。

Imparting effective communicational skills, leadership attributes towards the team work and developing critical thinking abilities to find solutions for civil engineering problems of multi-disciplinary nature.

#### **PSO 3: Challenging Employment**

Ability to take up any challenging employment, entrepreneurship, research and development for sustainable civil society as a civil engineering graduate.

Dr.S. SUNDARARAMAN, M.Tech., Pa.L.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Medagadinet Puril of Civil Englineering
Department of Civil Englineering

### STRUCTURE FOR UNDERGRADUATE ENGINEERING PROGRAM

SI. No	Course Category	Breakdown of Credits
101.01	Humanities and Social Sciences including Management courses (HS)	15
2	Basic Science Courses (BS)	20
3	Engineering Science including workshop, drawing, basics of electrical / mechanical / computer etc. (ES)	28
4	Professional Core Courses (PC)	66
5	Professional Electives Courses (PE)	18
6	Open Electives Courses (OE)	9
7	Project Work and Internship (PA)	13
8	Ability Enhancement Courses (AEC*)	0
9	Mandatory Courses (MC*)	0
	Total	169

#### SCHEME OF CREDIT DISTRIBUTION - SUMMARY

SI.No	AICTE		Credits per Semester									
SI.NO	Suggested Course Category	1	Ш	III	IV	V	VI	VII	VIII	Credits		
1	Humanities and Social Science (HS)	3	5	1	1	2	-		3	15		
2	Basic Sciences(BS)	7	4	5	4		-	7	-	20		
3	Engineering Sciences (ES)	11	5	4	4	4	-		-	28		
4	Professional Core (PC)	1	7	13	10	8	15	12		66		
5	Professional Electives (PE)	-	-	-	3	3	3	3	6	18		
6	Open Electives (OE)	-		-		3	3	3		9		
7	Project Work (PA)	e- F				1	1	2	8	12		
8	Internship (PA)	-				-		1		1		
9	Ability Enhancement Courses (AEC*)	-		-	-	-	7.	-		0		
10	Mandatory courses (MC*)		-				-	-	-	0		
	Total	22	21	23	22	21	22	21	17	169		

<sup>\*</sup> AEC and MC are not included for CGPA calculation

f. Ludavana\_

		S	EMESTER	₹-	1					
SI.	Course	Alabasa Titl			eric	ds		Max. Marks		
	Code	Course Title	Category	L	Т	Р	Credits	CAM	ESM	Tota
The	eory		5.4 40 5.0		2		х			
1	U23MATC01	Engineering Mathematics - I	BS	3	1	0	4	25	75	100
2	U23BSTC01	Physical Science for Engineers	BS	3	0	0	3	25	75	100
3	U23ESTC01	Basics of Civil and Mechanical Engineering	ES	3	0	0	3	25	75	100
4	U23ESTC02	Engineering Mechanics	ES	2	1	0	3	25	75	100
5	U23ESTC03	Basics of Electrical and Electronics Engineering	ES	3	0	0	3	25	75	100
Theo	ory cum Practi	cal						,	261	
6	U23ENBC01	Communicative English I	HS	2	0	2	3	50	50	100
Pra	ctical								77.4	7
7	U23ESPC01	Basics of Electrical and Electronics Engineering Laboratory	ES	0	0	2	1	50	50	100
8	U23ESPC02	Design Thinking and IDEA Lab	ES	0	0	2	1	50	50	100
9	U23CEP101	Civil Engineering Practice Laboratory	PC	0	0	2	1	50	50	100
Abil	ity Enhancem	ent Course				·				
10	U23CEC1XX	Certification Course – I**	AEC	0	0	4	, _	100	-	100
Man	datory Cours	е								
11	U23CEM101	Induction Programme	MC	2 We	eek	s	-	-	-	_
		· · · · · · · · · · · · · · · · · · ·					22	425	575	1000

<sup>\*\*</sup> Certification courses are to be selected from the list given in Annexure III

Dr.S. SUNDARARAMAN, M.Tech., Ph.L... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India Ur. S. SUNUARARANA, a rea. ra. projessor & Pheed Ocharbrent of Civil Eneg Sri Manarub Vinayagar Eneg. Genage Sri Manarub Vinayagar Eneg. Genage Nadagadhen, Suducterer, 1954

3

Department of Civil Engineering

		SEME	STER - I	1						
SI.	Course	Percolo			erio	ds		M	ax. Maı	rks
No.	Code	Course Title	Category	L	Т	P	Credits	CAM	ESM	Total
The	eory							-	1	<i>y</i> =-
1	U23MATC02	Engineering Mathematics - II	BS	3	1	0	4	25	75	100
2	U23CSTC01	Programming in C	ES	3	0	0	3	25	75	100
3	U23CET201	Mechanics of Solids - I	PC	2	1	0	3	25	75	100
4	U23CET202	Building Materials and Construction	PC	2	1	0	3	25	75	100
5	U23HSTC01	Universal Human Value II	HS	2	0	0	2	25	75	100
Theo	ory cum Pract	ical					_			4
6	U23ENBC02	Communicative English II	HS	2	0	2	3	50	50	100
Pra	ctical								Insira	er E
7	U23CSPC01	Programming in C Laboratory	ES	0	0	2	1	50	50	100
8	U23ESPC03	Engineering Graphics using AutoCAD	ES	0	0	2	1	50	50	100
9	U23CEP202	Strength of Materials Laboratory	PC	0	0	2	1	50	50	100
Abi	lity Enhancen	nent Course	9		1					
10	U23CEC2X X	Certification Course – II	AEC	0	0	4	0	100	-	100
Mar	ndatory Cours	e	· · · · · · · · · · · · · · · · · · ·	I		-				V- V-
11	U23CEM202	Sports Yoga and NSS	МС	0	0	2	0	100		100
		The state of the s								

P. Ludarerama\_

Dr.S. SUNDARARAMAN, M.Tech., Pa.S... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

		SEMES	STER - III							
SI.	Course	- T-4		P	erio	ds		Max. Marks		
No.	Code	Course Title	Category	L	T	Р	Credits	CAM	ESM	Tota
The	eory				4					
1,	U23MATC03	Probability and Statistics	BS	3	1	0	4	25	75	100
2	U23ADTC01	Programming in Python	ES	3	0	0	3	25	75	100
3	U23CET303	Fluid Mechanics and Machinery	PC	3	0	0	3	25	75	100
4	U23CET304	Construction Technique, Equipment and Practices	PC	3	0	0	3	25	75	100
5	U23CET305	Mechanics of Solids - II	PC	3	0	0	3	25	75	100
Γheo	ry cum Practio	cal							1	
6	U23CEB301	Surveying and Geomatics	PC	2	0	2	3	50	50	100
Prac	ctical		41.76		-				or a	
7	U23ENPC01	General Proficiency I	HS	0	0	2	1	50	50	100
8	U23MAPC01	Engineering Mathematics Laboratory	BS	0	0	2	1	50	50	100
9	U23ADPC01	Programming in Python Laboratory	ES	0	0	2	1	50	50	100
10	U23CEP303	Fluid Mechanics and Machines Laboratory	PC	0	0	2	1	50	50	100
Abil	ity Enhanceme	ent Course	- 1 2				0			
11	U23CEC3XX	Certification Course – III	AEC	0	0	4	0 ,	100	-	100
12	U23CES301	Skill Enhancement Course -  *	SEC	0	0	2	0	100	~-	100
Man	datory Course		l last	-			1-			
13	U23CEM303	Climate Change	MC	2	0	0	0	100	-	100
		Total					23	675	625	1300

<sup>\*</sup> Skill Enhancement Courses are to be selected from the list given in Annexure IV

I Andorrana

Dr.S. SUNDARARAMAN, M.Tech., Pa.L.,
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2.A.7.24

Department of Civil Engineering

		SEMES	TER – IV							
SI.	Course	rest State - Alagaran	a- withof p	P	eric	ods	Credit	Max. Marks		
No	Code	Course Title	Category	L	Т	Р	S	CAM	ESM	Tota
The	ory			i)			*			
1	U23MATC04	Numerical Methods and Optimization	BS	3	1	0	4	25	75	100
2	U23CSTC03	Data Structures	ES	3	0	0	3	25	75	100
3	U23CET406	Soil Mechanics	PC	3	0	0	3	25	75	100
4	U23CET407	Design of RC Elements	PC	3	0	0	3	25	75	100
5	U23CEE4XX	Professional Elective - I#	PE	3	0	0	3	25	75	100
The	ory cum Pract	ical					,			i.
6	U23CEB402	Concrete Technology	PC	2	0	2	3	50	50	100
Prac	ctical									
7	U23ENPC02	General Proficiency II	HS	0	0	2	1	50	50	100
8	U23CSPC02	Data Structures Laboratory	ES	0	0	2	1	50	50	100
9	U23CEP404	Geotechnical Engineering Laboratory	PC	0	0	2	1	50	50	100
Abilit	ty Enhanceme	ent Course						п		
10	U23CEC4XX	Certification Course – IV**	AEC	0	0	4	0	100	-	100
12	U23CES402	Skill Enhancement Course - II*	SEC	0	0	2	0	100	-	100
Man	datory Course	•	,							!
13	U23CEM404	Right to Information and Good Governance	мс	2	0	0	0	100	n <u>-</u> -V	100
Tota	ıl		1				22	625	575	1200

<sup>#</sup> Professional Electives are to be selected from the list given in Annexure I

Dr.S. SUNDARARAMAN, M.Tech., Ph.L... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India Department of Civil Engineering

2. A. 7. 25

		SEMES	STER - V							
SI. No	Course	Course Title		Р	eric	ods		IV	lax. Ma	rks
	Code	Course Title	Category	L	Т	Р	Credits	CAM	ESM	Total
The	eory				- 6			1 1		
1	U23HSTC02	2 Research Methodology	HS	2	0	0	2	25	75	100
2	U23ITTC02	Programming in Java	ES	3	0	0	3	25	75	100
3	U23CET508	Foundation Engineering	PC	3	0	0	3	25	75	100
4	U23CET509	Water supply and Wastewater Engineering	PC	3	0	0	3	25	75	100
5	U23CEE5XX	K Professional Elective - II#	PE	3	0	0	3	25	75	100
6	U23XXO5XX	C Open Elective – I <sup>\$</sup>	OE	3	0	0	3	25	75	100
Pra	ctical							1		
7	U23ITPC02	Programming In Java Laboratory	ES	0	0	2	1	50	50	100
8	U23CEP505	Water and Wastewater Engineering Laboratory	PC	0	0	2	1	50	50	100
9	U23CEP506	REVIT Architecture Laboratory	PC	0	0	2	1	50	50	100
Abi	lity Enhancen	nent Course						e 1		
10	U23CEC5XX	Certification Course – V	AEC	0	0	4	0	100		100
Pro	ject Work						N <sub>V</sub> '		11.	
11	U23CEW501	Micro Project	PA	0	0	2	1 1	100	-	100
Man	idatory Cours	е					ts.	9 E	, .	
12	U23CEM505	Essence of Indian Traditional Knowledge	МС	2	0	0	0	100	r = 0	100
16		Total					21	600	600	1200

SOpen electives are to be selected from the list given in Annexure II

Dr.S. SUNDARARAMAN, M.Tech., Pa.L.,
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Dr.S. SURDARARAMAN, & non. rel... Professor & Head

Spin 3 het 3 to see Interest 9 Department of Civil Engineering Spin 2 het 3 to see represent Vinancia in Court of Court of Spin 2 het 2 he

		SE	MESTER -	VI						
SI.	Course	O	0-4	Р	erio	ds	0 4:4-	М	ax. Mar	ks
No	Code	Course Title	Category	L	Т	Р	Credits	CAM	ESM	Total
The	ory					(		(4)		
1	U23CET610	Design of Steel Structures	PC	3	0	0	3	25	75	100
2	U23CET611	Structural Analysis	PC	3	0	0	3	25	75	100
3	U23CET612	Transportation Engineering	PC	3	0	0	3	25	75	100
4	U23CEE6XX	Professional Elective - III#	PE	3	0	- 0	3	25	75	100
5	U23XXO6XX	Open Elective – II <sup>\$</sup>	OE	3	0	0	3	25	75	100
The	ory cum Pract	tical								
7	U23CEB603	Instrumentation and sensor Technologies for Civil Engineering Application	PC	2	0	2	3	50	50	100
Pra	ctical					A CO		teril)	MAT.	
8	U23CEP607	STAAD PRO V8i Laboratory	PC	0	0	2	1	50	50	100
9	U23CEP608	Transportation Engineering Laboratory	PC	0	0	2	1	50	50	100
10	U23CEP609	Survey Camp	PC	0	0	0	1	50	50	100
Proje	ect Work		K			-	. 12		×	
11	U23CEW602	Mini Project	PA	0	0	2	1	100	-	100
Abil	ity Enhancen	nent Course							,	
12	U23CEC6XX	Certification Course – VI**	AEC	0	0	4	0	100	1 1	100
Man	datory Course	е		•	•			, 7,7	1.	
13	U23CEM606	Gender Equality	MC	2	0	0	0	100	-	100
		×		1	To	otal	22	625	575	1200

Dr.S. SUNDARARAMAN, M.Tech., Ph.L. Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Dr.S. SURBARAGAMAR, a. teol. Pol.

Department of Civil Engineering

2.4.7.27

		SEMES	STER - VII							
SI.	Course	Course Title	AMPLE	P	eric	ods		M	ax. Maı	·ks
No	Code	Course Title	Category	L	Т	Р	Credits	CAM	ESM	Total
The	eory									
1	U23CET713	Construction Technology and Management	PC	3	0	0	3	25	75	100
2	U23CET714	Hydrology and Water Resource Engineering	PC	3	0	0	3	25	75	100
3	U23CET715	Prefabricated Structures	PC	3	0	0	3	25	75	100
4	U23CEE7XX	Professional Elective – IV#	PE	3	0	0	3	25	75	100
5	U23XXO7XX	Open Elective – III <sup>\$</sup>	OE	3	0	0	3	25	75	100
Prac	ctical						ll			
6	U23CEP710	Simulation Software Laboratory	PC	0	0	2	1	50	50	100
7	U23CEP711	Estimation Costing and Valuation Engineering	PC	0	0	2	1	50	50	100
8	U23CEP712	Modelling and Analysis Laboratory	PC	0	0	2	1	50	50	100
Proj	ect Work							4.1	-34	
9	U23CEW703	Project Phase – I	PA	0	0	4	2	50	50	100
10	U23CEW704	Internship / Inplant Training	PA	0	0	2	1	100		100
		Total					21	425	575	1000

		SEMEST	ER - VIII							
SI. No	Course	Course Title	0-4	Periods			0 111	Max. Marks		
	Code	Course Title	Category	L	Т	Р	Credits	CAM	ESM	Total
The	ory	*	41 -	4	n p		1	K B ] T S		
1	U23HSTC03	Entrepreneurship and Business Management	HS	3	0	0	3	25	75	100
2	U23CEE8XX	Professional Elective – V#	PE	3	0	0	3	25	75	100
3	U23CEE8XX	Professional Elective – VI#	PE	3	0	0	3	25	75	100
Pro	ject Work									
4	U23CEW805	Project Phase – II	PA	0	0	1	8	50	100	150
	90	Total	all and				17	125	325	450

Dr.S. SUNDARARAMAN, M. Tech., Pa.L... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Pududherry, India

#### Annexure - I

#### PROFESSIONAL ELECTIVE COURSES

Profes	sional Elective –	I (Offered in Semester IV)
SI. No.	Course Code	Course Title
1	U23CEE401	Composite Structures
2	U23CEE402	Environmental Law and Policy
3	U23CEE403	Building Services
4	U23CEE404	Remote Sensing and GIS
5	U23CEE405	Alternative Building Materials and Technologies
Profes	sional Elective –	II (Offered in Semester V)
SI. No.	Course Code	Course Title
-5.1	U23CEE506	Advanced Design of RCC Structures
2	U23CEE507	Air and Noise Pollution
3	U23CEE508	Sustainable and Lean Construction
4	U23CEE509	Airport and Harbor Engineering
5	U23CEE510	Green Building Technology
Profess	sional Elective –	III (Offered in Semester VI)
SI. No.	Course Code	Course Title
-1	U23CEE611	Advanced Structural Analysis
2	U23CEE612	Pollution Control and Monitoring
3	U23CEE613	Buildings Codes and Requirement
4	U23CEE614	Traffic engineering and Management
5	U23CEE615	Urban Planning and Development

P. Judawana\_

Professional Elective – SI. No. Course Code			
01. 140.	Course Code	Course Title	
1	U23CEE716	Structural Health Monitoring	
2	U23CEE717	Municipal Solid Waste Management	
3	U23CEE718	Quality Control and assurance in Construction	
4 U23CEE719		Tunneling Engineering	
5	U23CEE720	Architecture and Town Planning	
Profess	ional Elective –	- V (Offered in Semester VIII)	
SI. No.	Course Code	Course Title	
1	U23CEE821	Precast Structures	
2	U23CEE822	Industrial Waste Disposal and Treatment	
3	U23CEE823	Construction Safety	
4	U23CEE824	Intelligent Transport System	
5	U23CEE825	Interior Design	
rofessi	onal Elective –	VI (Offered in Semester VIII)	
I. No.	Course Code Course Title		
1	U23CEE826	Pre- Stressed Concrete Structures	
2	U23CEE827	Environmental Impact Assessment	
3	U23CEE828	Natural Disaster and Mitigation	
4	U23CEE829	Bridge Engineering	
5	U23CEE830	Smart City	

Dr.S. SUNDARARAMAN, M.Tech., Pa.L.,
Professor & Head

Sri Manakula Vinayagar Engg. Cellege Madagadipet, Puducherry, India

Decay to an are expensed and a set of the English and a set of the engl

#### Annexure - II

#### **OPEN ELECTIVE COURSES OFFERED BY CIVIL ENGINEERING**

S. No	Course Code	Course Title
Open Ele	ective – I	use the source of the source o
1	U23CEOC01	Energy and Environment
2	U23CEOC02	Energy Efficient Buildings
Open Ele	ective – II	
1	U23CEOC03	Disaster Management
2	U23CEOC04	Air Pollution and Solid Waste Management

P. Indawana\_

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.,

Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

#### Annexure -III

## ABILITY ENHANCEMENT COURSES - CERTIFICATION COURSES

Semester	Course Code	R-2023 Course Title
1	U23CEC107	Autodesk AutoCAD - ACU
II	U23CEC248	Sketch Up
Ш	U23CEC360	Total Station
IV	U23CEC430	Fundamentals of Internet of Things
V	U23CEC511	Autodesk 3ds Max -ACU
VI U23CEC656		MX Road

1. Andersana\_

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.,
Professor & Head
Department of Civil Engg

Sri Manabula Vinavagar Ener College Madagadipot, Puducheri Friedreerin

or s. Sunda Rakaalah, eret or

Department of Cultificials

traffic capacity

Annexure - IV
Skill Enhancement Courses

SI. No	Course Code	Course Title
	U23CES301	Skiii Enhancement Course - I
		1) Basic Vasthu
1		2) Plane Table Surveying
		3) Auto level surveying
	U23CES402	Skill Enhancement Course - II
		1) MS Office – Word, Excel, Power Point
2		2) Measurements and Conversion
		3) Traditional construction in modern age

I- Kudarana\_

Dr.S. SUNDARARAMAN, M.Tech., Ph.:.. Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

# **NPTEL COURSE LIST**

SI.No.	List of Subjects	
1 -	Geosynthetics and Reinforced Soil Structures	1
2	Principles of Construction Management	
3	Introductory Field Structural Geology	
4	Geotechnical Earthquake Engineering	
5	Finite Element Method and Computational Structural Dynamics	_
6	Underground Space Technology	
7	Environmental Chemistry	1
8	Sustainable Transportation Systems	
9	Environmental Modeling and Simulation	
10	Pavement Materials (Under Pavement Engineering)	
11	Advanced Geomatics Engineering	
12	Geometric Design of Highways	
13	Plate Tectonics	
14	Introduction to Engineering Seismology	
15	Remote Sensing: Principles and Applications	,
16	Geotechnical Engineering - II	Ti.
17	Environmental Geomechanics	-
18	Advanced Concrete Technology	-
19	Geotechnical Engineering Laboratory	
20	Dynamics of Structures	
21	Mechanics of Solids	
22	Structural Geology	
23	Reliability-Based Structural Design	
24	River Engineering	-
25	Optimization Methods for Civil Engineering	
26	Subsurface Exploration: Importance And Techniques Involved	
27	Remote Sensing and GIS	
28	Municipal Solid Waste Management	
29	Fluid Mechanics	
30	Bridge Engineering	
31	Introduction to Multimodal Urban Transportation Systems (MUTS)	
32	Rock Mechanics and Tunneling	
33	Ground Improvement	
34	Wastewater Treatment and Recycling	
35	Sustainable Engineering Concepts and Life Cycle Analysis	
36	Global Navigation Satellite Systems and Applications	T. P.
37	Soil Mechanics/Geotechnical Engineering I	76
38	Railway Engineering	
39	Geo Engineering	
40	Earth Sciences for Civil Engineering Part - I & II	
41	Foundation Engineering	
42	Design Of Steel Structures	

Dr.S. SUNDARARAMAN, M.Tech., Pa.:
Professor & Head
Department of Civil Engs

Department of Civil Engg Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

#### **MOOC COURSE LIST**

SI.No.	List of Subjects
1	Construction Project Management
2	Python fundamentals for beginners
3	Risk and safety in civil engineering
4	Energy literacy training
5	Architecture urban design
6	Autodesk certified professional: AutoCAD for Design and Drafting exam prep
7	Transportation, Sustainable Buildings, Green Construction
8	Al for everyone: Master the basics
9	Python Basics for Data Science
10	Introduction to Engineering Mechanics
11	Construction Project Management
12	Python fundamentals for beginners
13	Risk and safety in civil engineering
14	Energy literacy training
15	Architecture urban design
16	Autodesk certified professional: AutoCAD for Design and Drafting exam prep
17	Transportation, Sustainable Buildings, Green Construction
18	Al for everyone: Master the basics
19	Python Basics for Data Science
20	Introduction to Engineering Mechanics

P. Indoorana\_

Dr.S. SUNDARARAMAN, M.Tech., Pn.L.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2.A.7.35

the countries and the second section in the second section in the second section is a second section in the second section in the second section is a second section in the section in the second section in the section in the second section in the section in the

The following courses are provided by Trainlab Academy for Regulation 2023:

# ABILITY ENHANCEMENT COURSES-(A) CERTIFICATION COURSES

S. No	Course Code	Course Title	Certified B
1	U23XXCX01	Adobe Photoshop	Adobe
2	U23XXCX02	Adobe Animate	Adobe
3	U23XXCX03	Adobe Dreamweaver	Adobe
4	U23XXCX04	Adobe After Effects	Adobe
5	U23XXCX05	Adobe Illustrator	Adobe
6	U23XXCX06	Adobe InDesign	Adobe
7	U23XXCX07	Autodesk AutoCAD -ACU	Autodesk
8	U23XXCX08	Autodesk Inventor - ACU	
9	U23XXCX09	Autodesk Revit - ACU	Autodesk
10	U23XXCX10	Autodesk Fusion 360 - ACU	Autodesk
11	U23XXCX11	Autodesk 3ds Max - ACU	Autodesk
12	U23XXCX12	Autodesk Maya - ACU	Autodesk
13	U23XXCX13	Cloud Security Foundations	Autodesk
14	U23XXCX14	Cloud Computing Architecture	AWS
15	U23XXCX15	Cloud Foundation	AWS
16	U23XXCX16	Cloud Practitioner	AWS
17	U23XXCX17	Cloud Solution Architect	AWS
18	U23XXCX18	Data Engineering	AWS
19	U23XXCX19	Machine Learning Foundation	AWS
20	U23XXCX20	Robotic Process Automation / Medical Robotics	AWS
21	U23XXCX21	Advance Programming Using C	Blue Prism
22	U23XXCX22	Advance Programming Using C ++	CISCO
23	U23XXCX23	C Programming	CISCO
24	U23XXCX24	C++ Programming	CISCO
25	U23XXCX25	CCNP Enterprise: Advanced Routing	CISCO
26	U23XXCX26	CCNP Enterprise: Core Networking	CISCO
27	U23XXCX27	Cisco Certified Network Associate - Level 2	CISCO
28	U23XXCX28	Cisco Certified Network Associate- Level 1	CISCO
29	U23XXCX29	Cisco Certified Network Associate- Level 3	CISCO
30	U23XXCX30	Fundamentals Of Internet of Things	CISCO
31	U23XXCX31	Internet Of Things / Solar and Smart Energy System with IoT	CISCO
32	U23XXCX32	Java Script Programming	CISCO
33	U23XXCX33	NGD Linux Essentials	CISCO
34	U23XXCX34	NGD Linux I	CISCO
35	U23XXCX35	NGD Linux II	CISCO
36	U23XXCX36	Advance Java Programming	CISCO
37	U23XXCX37	Android Programming / Android Medical App Development	Ethnotech
38	U23XXCX38	Angular JS	Ethnotech Ethnotech

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.,
Professor & Head

Sri Mahakula Vinayagar Engg. College Madagadipet, Puducherry, India

# Academic Curriculum 2023 (R - 2023)

39	U23XXCX39	Catia	Ethnotech
40	U23XXCX40	Communication Skills for Business	Ethnotech
41	U23XXCX41	Coral Draw	Ethnotech
42	U23XXCX42	Data Science Using R	Ethnotech
43	U23XXCX43	Digital Marketing	Ethnotech
44	U23XXCX44	Embedded System Using C	Ethnotech
45	U23XXCX45	Embedded System with IOT / Arduino	Ethnotech
46	U23XXCX46	English For IT	Ethnotech
47	U23XXCX47	Plaxis	Ethnotech
48	U23XXCX48	Sketch Up	Ethnotech
49	U23XXCX49	Financial Planning, Banking and Investment Management	Ethnotech
50	U23XXCX50	Foundation Of Stock Market Investing	Ethnotech
51	U23XXCX51	Machine Learning / Machine Learning for Medical Diagnosis	Ethnotech
52	U23XXCX52	IOT Using Python	Ethnotech
53	U23XXCX53	Creo (Modelling & Simulation)	Ethnotech
54	U23XXCX54	Soft Skills, Verbal, Aptitude	Ethnotech
55	U23XXCX55	Software Testing	Ethnotech
56	U23XXCX56	MX-Road	Ethnotech
57	U23XXCX57	CLO 3D	Ethnotech
58	U23XXCX58	Solid works	Ethnotech
59	U23XXCX59	Staad Pro	Ethnotech
60	U23XXCX60	Total Station	Ethnotech
61	U23XXCX61	Hydraulic Automation	Festo
62	U23XXCX62	Industrial Automation	Festo
63	U23XXCX63	Pneumatics Automation	Festo
64	U23XXCX64	Agile Methodologies	IBM
65	U23XXCX65	Block Chain	IBM
66	U23XXCX66	Devops	IBM
67	U23XXCX67	Artificial Intelligence	ITS
68	U23XXCX68	Cloud Computing	ITS
69	U23XXCX69	Computational Thinking	ITS
70	U23XXCX70	Cyber Security	ITS
71	U23XXCX71	Data Analytics	ITS
72	U23XXCX72	Databases	ITS
73	U23XXCX73	Java Programming	ITS
74	U23XXCX74	Networking	ITS
75	U23XXCX75	Python Programming	ITS
76	U23XXCX76	Web Application Development (HTML, CSS, JS)	ITS
77	U23XXCX77	Network Security	ITS & Palo alto
78	U23XXCX78	MATLAB	MathWorks
79	U23XXCX79	Azure Fundamentals	Microsoft
80	U23XXCX80	Azure Al (Al-900)	Microsoft
81	U23XXCX81	Azure Data (DP -900)	Microsoft
82	U23XXCX82	Microsoft 365 Fundamentals (SS-900)	Microsoft
83	U23XXCX83	Microsoft Security, Compliance and Identity (SC-900)	Microsoft
84	U23XXCX84	Microsoft Power Platform (PI-900)	Microsoft
85	U23XXCX85	Microsoft Dynamics Fundamentals 365 – CRM	Microsoft
86	U23XXCX86	Microsoft Excel	Microsoft
87	U23XXCX87	Microsoft Excel Expert	Microsoft
88	U23XXCX88	Securities Market Foundation	NISM

# Academic Curriculum 2023 (R - 2023)

89	U23XXCX89	Derivatives Equinity	
90	U23XXCX90	Research Analyst	NISM
91	U23XXCX91	Portfolio Management Services	NISM
92	U23XXCX92	Cyber Security	NISM
93	U23XXCX93	Cloud Security	Palo alto
94	U23XXCX94	PMI – Ready	Palo alto
95	U23XXCX95	Tally – GST & TDS	PMI
96	U23XXCX96	Advance Tally	Tally
97	U23XXCX97	Associate Artist	Tally
98	U23XXCX98	Certified Unity Programming	Unity
99	U23XXCX99	VR Development	Unity
		1 - 1. S. Spinorit	Unity

		the state of the s	
		Industry designed	
		Aller-Reduction	

# ANNEXUREI

# ANNEXUREL

Department	Civil	Engineer	ing	Progra	Programme : B.Tech.								
Semester	III	,		Cours	e Categ	gory Code	e: PC End	Semester	Exam T	vpe: T			
Course	11230	ET305			riods/W		Credit	·	imum Ma	***************************************			
Code	0200	/L1000		L	Т	Р	С	CAM	ESE	TM			
Course Name	Mech	anics of S	olids II	3	0	0	3	25	75	100			
Prerequisite	Meci	nanics of	Solids I										
	On o	completio	n of the course, the	students will b	e able	to	BT Mapp (Highe						
	CO1	Determine	the deflection of variou	is types of beams					1	(3			
Course	CO2 Calculate the strain energy for materials.												
Outcomes	CO3 Analyse the indeterminate structures and draw the shear force and bending moment diagrams for continuous beam.												
	CO4												
	CO5	Discuss the theories of failure and slee to find the											
UNIT- I	DEFLE	CTION OF	BEAMS					Perio	ds: 09				
Slope and D method.	eflection	on – Deflec	tion of cantilever and	simply supported	beams	– Macaula	ay's method	and conju	gate bear	n CO1			
UNIT- II	ENER	GY PRINCIP	LES					Perio	ds: 09	L			
Strain energ	gy due	to applica	tion of gradual, sudde	n and impact loa	d- Prin	ciple of vi	irtual displac	ement- Ca	astigliano'	s			
theorem – S	imply s	upported b	eam							CO2			
UNIT - III		ERMINATE						Perio					
Introduction beams - she	n – Degr ar force	ee of station	indeterminacy for bea ng moment diagrams f	ms and frames. The continuous bea	neorem ims.	of three m	noments - an	alysis of co	ntinuous	CO3			
UNIT - IV	DEFLE	CTION OF 1	RUSSES AND FRAMES					Period	ds: 09				
Introduction	– Defl	ection of T	russes – Simply suppor	ted and Cantileve	er - Defl	ection of I	Frames - Sin	nply suppo	rted and	CO4			
- Cantilever –	***************************************		/ Strain energy method	d						001			
**************************************								Period	ls: 09				
UNIT - V	THEOF	VILO OF FAI	LURE AND UNSYMMET	RICAL BENDING						1			
Various theo	ries of	failure – Ur	nsymmetrical bending c	of beams – 'L' and			centre – Cha						
Various theo	ries of	failure – Ur		of beams – 'L' and			centre – Cha		sections Periods	CO5			
UNIT - V  Various theo  Lecture Per  Text Books	ries of	failure – Ur	nsymmetrical bending o	of beams – 'L' and Practica	al Perio	ods: -	centre – Cha						
Various theo  Lecture Per  Ext Books  R.K.Bansal, "A	ries of	failure – Ur	nsymmetrical bending of Tutorial Periods: -	of beams – 'L' and  Practica  ni Publications, Si	al Perio	ods: -	centre – Cha						
Various theo Lecture Per ext Books R.K.Bansal, "A R.K.Rajput, "S	riods:	failure – Ur  45  ook of Stre of material	nsymmetrical bending of Tutorial Periods: - ngth of materials", Laxns", S. Chand publishers	Practicani Publications, Si., 7th edition, 2018	al Perio	ods: - on, 2018.							
Various theo Lecture Per Fext Books R.K.Bansal, "A R.K.Rajput, "S R. S. Khurmi,"	riods:  Text B trength	failure – Ur  45  ook of Stre of material	nsymmetrical bending of Tutorial Periods: -	Practicani Publications, Si., 7th edition, 2018	al Perio	ods: - on, 2018.							
Various theo Lecture Per Ext Books R.K.Bansal, "A R.K.Rajput, "S R. S. Khurmi, "Reference Bo	riods: Text B trength Strengt	failure – Ur  45  Fook of Stre of material	Tutorial Periods: -  ngth of materials", Laxns", S. Chand publishers als", S. Chand and Com	Practicani Publications, Single 7th edition, 2018	xth Edition	ods: - on, 2018.							
Various theo Lecture Per ext Books R.K.Bansal, "A R.K.Rajput, "S R. S. Khurmi, " Reference Bo Ramamrutha	riods: A Text B trength 'Strengtooks m, S., "	failure – Ur  45  look of Stre of material th of Materi	Tutorial Periods: -  ngth of materials", Laxns", S. Chand publishers als", S. Chand and Com	Practicani Publications, Single Properties, 7th edition, 2018 apany Ltd, New Decard Sons, 18th Editions, 18th E	xth Edition	ods: - on, 2018. n Edition, 2	2019.						
Various theo Lecture Per Text Books R.K.Bansal, "A R.K.Rajput, "S R. S. Khurmi, " Reference Bo I. Ramamrutha	riods:  Text B trength Strengt ooks m, S., "	failure – Ur  45  book of Stre of material th of Materi  Strength of Ratwani, "Ar	Tutorial Periods: -  ngth of materials", Laxns", S. Chand publishers als", S. Chand and Com  Materials", DhanpatRainalysis of Structures, Vo	Practicani Publications, Single Properties, 7th edition, 2018 apany Ltd, New Design Sons, 18th Editor, Khanna Pub	xth Edition elhi, 26th dition, 20	ods: - on, 2018. n Edition, 2 014 New Delhi,	2019.						
Various theo  Lecture Per  Ext Books R.K.Bansal, "A R.K.Rajput, "S R. S. Khurmi, " Reference Bo Ramamrutha L.V.N. Vazirani B. Bhavikatti S S	Text B trength coks m, S., " m, M.M.F. S, "Struck	failure – Ur  45  ook of Stre of material th of Materi  Strength of Ratwani, "Ar	Tutorial Periods: -  ngth of materials", Laxns", S. Chand publishers als", S. Chand and Com	Practical Practi	at Period with Edition elhi, 26th dittion, 20 lishers, I New Dell	ods: - on, 2018. n Edition, 2 014 New Delhi, hi, 4rd Edit	2019. , 2015. tion, 2013						

Dr.S. SUNDARARAMAN, M.Tech., Ph.z...
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. Cellege Madagadipet, Puducherry, India

#### **Web References**

- 1. https://nptel.ac.in/content/storage2/courses/105105109/pdf/m3l15.pdf
- https://www.youtube.com/watch?v=uMuFpT1gFVI
- 3. https://youtu.be/6CLEWA2WNqM
- 4. https://nptel.ac.in/content/storage2/courses/105101085/downloads/lec-24.pdf
- 5. https://nptel.ac.in/content/storage2/courses/105105109/pdf/m2l12.pdf

# COs/POs/PSOs Mapping

COs		Program Outcomes (POs)													Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	SO1 PSO2	PSO3		
1	3	2	2	3		-		-	-	-	-	1	2	-	2		
2	3	2	2	3	-	-	-	-	-	7 <b>-</b> -	-	1	2	-	2		
3	3	2	2	3	-	-	-	-	-	-	-	1	2	1 14-	2		
4	3	2	2	3		-	-	-	-	1-		1	2	-	2		
5	3	2	2	3			-	-		-		_ 1	2	-	2		

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

	10426-022	Co	End Semester	Total				
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks	
Marks	5	5	5	5	5	75	100	

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.L... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering

Regard & Hear Repartment of Civil Edgs

Set Mariakuta Vinayagar Emgo Obitem

2.4.7.43

Department	Civil E	Enginee	ring	Programme: B.Tech.									
Semester	IV			Course	Catego	ry Cod	nd Semester Exam Type: TE						
Course Code	U23CI	FT406		Periods	:/Week		Credi		num Mar	***************************************			
Course Name				L	T	Р	С	CAM	ESE	TM			
	<u> </u>	echanio	es .	3	<u> </u>	0	3	25	75	100			
Prerequisite	Nil	1											
7	On co	mpletic	on of the course, the st	udents will b	e able t	0			BT Ma (Highes	apping st Level			
	CO1	Class	fy the soil and assess th	e Engineering	Proper	ties, ba	sed on inc	ex propertie	s K	(3			
Course Cutooma CO2 Assess the soil hydraulics and geostatic stress						K	(3						
Outcome	CO3	Under	stand the compressibility	y of soil under	consoli	dation	and compa	ction	K	(3			
	CO4	Under	stand the concept shear	strength of co	ohesive	and co	hensionles	s soil.	K	(3			
	CO5	K	(3										
UNIT – I	IDENT	IFICAT	ION AND CLASSIFICAT	TION OF SOIL	_S		Periods	09					
ormation of soil	- Basic	definitio	n and phase relationship	- Index prope	rties (De	etermin	ation of mo	isture conter	nt, specific	:			
gravity and void	s ratio	, grain	size analysis , Atterberg lassification system - soi	g limits) - clas	ssification	on of s	oil- Burea	u of Indian	Standards	CO1			
UNIT – II	PERM	EABILI'	TY AND SEEPAGE IN S	SOILS	a in		Periods:		12.12.11				
Soil hydraulics :	Soil wat	er – cap	illary - Permeability - fiel	ld and laborate	ory test	- one d	mensiona	flow, Seepa	ge throug	h			
solls – two - dime	ensiona	I flow, flo	ow nets, uplift pressure.	piping, capilla	rity, see	page fo	rce; Princ	ple of geosta	tic stress	- CO2			
neutral and effec	tive stre	ess and	quicksand condition.										
UNIT – III			TION AND COMPACTIO	N		a Santa La	Periods:	ng					
Compressibility : T	erzaghi'												
and log t methods	cizagiii.	s one din	nensional consolidation the	eory - consolida	tion prod	cess – C	Computation	of rate of set	tlement	√t			
and log t methods	s- e-log	p relation	onship – laboratory test –	pre consolidat	ion pres	sure. C	computation ompaction	of rate of set	ests - fie	ld			
and log t methods compaction. Stress	s– e-log s distribu	p relation ution in h	nensional consolidation the onship – laboratory test – omogeneous and isotropic	pre consolidat	ion pres	sure. C	computation ompaction	of rate of set	ests - fie	ld			
ompaction. Stress of New marks influ	s– e-log s distribu ence cha SHEAI	p relation ution in heart. R STRE	onship – laboratory test – omogeneous and isotropic NGTH	pre consolidat medium – Bou	tion pres	sure. C theory –	computation ompaction (Point load	of rate of set  - laboratory  , Line load an	tests – fie d UDL) Us	e CO3			
compaction. Stress of New marks influ UNIT – IV Chear strength of c	s— e-log s distribu ence cha SHÉAI cohesive	p relation in heart.  R STRE	onship – laboratory test – omogeneous and isotropic NGTH esion less soils – Mohr-Cou	pre consolidat medium – Bou	tion pres	sure. Cotheory –	Computation ompaction (Point load  Periods:	of rate of set  - laboratory , Line load an	tests – fie d UDL) Us	cO3			
compaction. Stress of New marks influ UNIT – IV Chear strength of c	s— e-log s distribu ence cha SHEAI cohesive on, UCC	p relation in heart.  R STRE	onship – laboratory test – omogeneous and isotropic NGTH esion less soils – Mohr-Cou e shear tests – Pore pressi	pre consolidat medium – Bou	tion pres	sure. Cotheory –	computation ompaction (Point load  Periods: nent of shead — Liquefact	of rate of set  - laboratory , Line load an  09  r strength - Di  tion.	tests – fie d UDL) Us	cO3			
and log t methods compaction. Stress of New marks influ UNIT – IV Shear strength of c riaxial compressic UNIT – V	s— e-log s distribu ence cha SHEAI cohesive on, UCC SLOPE	p relation in heart.  R STRE  and cohe and Van	onship – laboratory test – comogeneous and isotropic  NGTH esion less soils – Mohr-Cou e shear tests – Pore pressi	pre consolidat medium – Bou ulomb failure the ure parameters	ssinesq eory – M – Cyclic	easuren mobility	computation ompaction (Point load  Periods: nent of shead — Liquefact  Periods:	of rate of set  - laboratory , Line load an  09  r strength - Di tion.	ests – fie d UDL) Us rect shear,	CO4			
and log t methods compaction. Stress of New marks influ UNIT – IV Shear strength of c riaxial compressic UNIT – V Introduction- slopes tability number-Slo	s— e-log s distribu ence cha SHEAI cohesive on, UCC SLOPE s failure ope stab	p relation in heart.  R STRE and cohe and Van  E STAB - stability	onship – laboratory test – omogeneous and isotropic NGTH esion less soils – Mohr-Cou e shear tests – Pore pressi	pre consolidat medium – Bou  ulomb failure the ure parameters	eory – M – Cyclic	easuren mobility	computation ompaction (Point load  Periods: nent of shead — Liquefact  Periods:	of rate of set  - laboratory , Line load an  09  r strength - Di tion.	ests – fie d UDL) Us rect shear,	CO4			
and log t methods compaction. Stress of New marks influ UNIT – IV Shear strength of coriaxial compression UNIT – V Introduction- slopes tability number-Slo Lecture Period	s— e-log s distribu ence cha SHEAI cohesive on, UCC SLOPE s failure ope stab	p relation in heart.  R STRE and cohe and Van  E STAB - stability	onship – laboratory test – comogeneous and isotropic  NGTH esion less soils – Mohr-Cou e shear tests – Pore pressi  ILITY  of infinite slope – landslide	pre consolidat medium – Bou  ulomb failure the ure parameters	eory – M – Cyclic nalysis -	easuren mobility Bishop	computation ompaction (Point load  Periods: nent of shead — Liquefact  Periods:	of rate of set  - laboratory , Line load an  09  r strength - Di tion.	tests – fied UDL) Us rect shear,	CO4			
and log t methods compaction. Stress of New marks influ UNIT – IV Shear strength of c riaxial compression UNIT – V Introduction- slopes stability number-Slo Lecture Period Text Books	s- e-log s distribu ence cha SHEAI schesive on, UCC SLOPI s failure ope stab s: 45	p relation in heart. R STRE and cohe and Van E STAB - stability illity – imp	onship – laboratory test – omogeneous and isotropic  NGTH esion less soils – Mohr-Coue shear tests – Pore pressi  ILITY  of infinite slope – landslide proving slope stability by re  Tutorial Periods: -	ulomb failure the ure parameters es-Finite slope a inforcement and	eory – M – Cyclic unalysis - d confine	easuren mobility Bishopement ds: -	Periods: Periods: Periods: Periods: Periods: Periods:	of rate of set  - laboratory , Line load an  09  r strength - Di tion.  09  Swedish circle  Total Period	rect shear, method –	CO4			
and log t methods compaction. Stress of New marks influ UNIT – IV Shear strength of compaction of the compression of the compression of the compact of the c	s- e-log s distribu ence che SHEAI cohesive on, UCC SLOPI s failure ope stab s: 45	p relation in heart. R STRE and cohe and Van E STAB - stability illity – imp	onship – laboratory test – comogeneous and isotropic NGTH esion less soils – Mohr-Coue shear tests – Pore pressolLITY of infinite slope – landslide proving slope stability by re Tutorial Periods: -	pre consolidat medium – Bou  ulomb failure the ure parameters es-Finite slope a inforcement and Practica  xmi Publicatio	eory – M – Cyclic analysis - d confine al Perio	easuren mobility Bishopement  ds: -	Periods: nent of shear - Liquefac Periods: s method -	of rate of set  - laboratory , Line load an  09  r strength - Dition.  09  Swedish circle  Total Period	rect shear, e method –	CO4			
ind log t methods compaction. Stress of New marks influ UNIT – IV Chear strength of criaxial compression UNIT – V Introduction- slopestability number-Slecture Period Ext Books  Punmia B.C. Arora, K.R.,	s- e-log s distribu ence cha SHEAI cohesive on, UCC SLOPE s failure ope stab s: 45 , "Soil Me	p relation in heart. R STRE and cohe and Van E STAB - stability illity – imp	onship – laboratory test – omogeneous and isotropic  NGTH esion less soils – Mohr-Coue shear tests – Pore pressi  ILITY  of infinite slope – landslide proving slope stability by re  Tutorial Periods: -	pre consolidat medium – Bou  ulomb failure the ure parameters es-Finite slope a inforcement and Practica  xmi Publicatio	eory – M – Cyclic analysis - d confine al Perio	easuren mobility Bishopement  ds: -	Periods: nent of shear - Liquefac Periods: s method -	of rate of set  - laboratory , Line load an  09  r strength - Dition.  09  Swedish circle  Total Period	rect shear, e method –	CO4			
ind log t methods compaction. Stress of New marks influing the work of New marks influing the work of	s- e-log s distribu ence cha SHEAI cohesive on, UCC SLOPI s failure ope stab s: 45  , "Soil Me 'Soil Me )).	p relation in heart.  R STRE and cohe and Van E STAB - stability illity – imp	onship – laboratory test – omogeneous and isotropic  NGTH esion less soils – Mohr-Coue shear tests – Pore pressi  ILITY  of infinite slope – landslide proving slope stability by re  Tutorial Periods: -  cs and Foundations", Last and Foundation Engine	pre consolidate medium – Bournellomb failure the ure parameters es-Finite slope a inforcement and Practica exmi Publication ering", Standa	eory – M – Cyclic unalysis - d confine al Perio ns Pvt.	easuren mobility Bishopement ds: Ltd., Ne	Periods: nent of sheat - Liquefac Periods: s method - ew Delhi, 1 and Distrik	of rate of set  - laboratory , Line load an  09  r strength - Di  tion.  09  Swedish circle  Total Period  7th Edition,  utors, New I	rect shear, method – ds: 45 (2017). Delhi, 7th	CO4  CO5			
ind log t methods compaction. Stress of New marks influ UNIT – IV Shear strength of criaxial compression  UNIT – V Introduction- slopestability number-Sle Lecture Period  ext Books Punmia B.C. Arora, K.R., 2017(Reprint Murthy, V.N.S. 2014.	s- e-log s distribu ence che SHEAI cohesive on, UCC SLOPI s failure ope stab s: 45 , "Soil Me s). S., "Tex	p relation in heart.  R STRE and cohe and Van E STAB - stability illity – imp	onship – laboratory test – omogeneous and isotropic  NGTH esion less soils – Mohr-Coue shear tests – Pore pressi ILITY  of infinite slope – landslide proving slope stability by re  Tutorial Periods: -  cs and Foundations", Last and Foundation Engine	pre consolidate medium – Bournellomb failure the ure parameters es-Finite slope a inforcement and Practica ering", Standa bundation engi	eory – M – Cyclic unalysis - d confine al Perio ns Pvt. neering	easuren mobility Bishopement ds: - Ltd., Nellishers	Periods: Publishers	of rate of set  - laboratory , Line load an  09  r strength - Di tion.  09  Swedish circle  Total Period  7th Edition, ( utors, New I	rect shear, method – ds: 45 (2017). Delhi, 7th	CO4 CO5 Edition			
ind log t methods compaction. Stress of New marks influ UNIT – IV Shear strength of criaxial compression.  UNIT – V Introduction-slopestability number-Sletability number-Sletat Books  Punmia B.C. Arora, K.R., 2017(Reprint Murthy, V.N., 2014. Purushotham	s- e-log s distribu ence cha SHEAI cohesive on, UCC SLOPI s failure ope stab s: 45 , "Soil Me cohesive	p relation in heart.  R STRE and cohe and Van E STAB - stability – imp Mechanics t book o	onship – laboratory test – comogeneous and isotropic NGTH esion less soils – Mohr-Coue shear tests – Pore pressilLITY of infinite slope – landslide proving slope stability by retroving slope stability slope slope stability by retroving slope stability slope slope stability slope slope stability slope slope slope stability slope slope stability slope slope slope slope slope slope slope stability slope slop	pre consolidate medium – Boundarium – Boundarium – Boundarium – Boundarium bullomb failure the ure parameters es-Finite slope a inforcement and Practica practica ering", Standarium enginon Engineering	eory – M – Cyclic analysis - d confine al Perio ns Pvt. ard Pub neering	easuren mobility Bishopement ds: - Ltd., Ne lishers ", CBS	Periods: nent of sheat - Liquefac Periods: s method - ew Delhi, 1 and Distrik Publishers , Pearson	of rate of set  - laboratory , Line load an  09  r strength - Di  tion.  09  Swedish circle  Total Period  7th Edition, utors, New I  Distribution  Education, Ii	rect shear, method – ds: 45 (2017). Delhi, 7th	CO4 CO5 Edition			
ind log t methods ompaction. Stress of New marks influ UNIT – IV Shear strength of criaxial compression. UNIT – V Introduction- slopestability number-Slecture Period ext Books  Punmia B.C. Arora, K.R., 2017(Reprint) Murthy, V.N. 2014 Purushotham Varghese, P.	s- e-log s distribu ence cha SHEAI cohesive on, UCC SLOPE s failure ope stab s: 45 , "Soil Me c). S., "Tex na Raj. I C."Four	p relation in heart.  R STRE and cohe and Van E STAB - stability – imp Mechanics t book o	onship – laboratory test – omogeneous and isotropic  NGTH esion less soils – Mohr-Coue shear tests – Pore pressi ILITY  of infinite slope – landslide proving slope stability by re  Tutorial Periods: -  cs and Foundations", Last and Foundation Engine	pre consolidate medium – Boundarium – Boundarium – Boundarium – Boundarium bullomb failure the ure parameters es-Finite slope a inforcement and Practica practica ering", Standarium enginon Engineering	eory – M – Cyclic analysis - d confine al Perio ns Pvt. ard Pub neering	easuren mobility Bishopement ds: - Ltd., Ne lishers ", CBS	Periods: nent of sheat - Liquefac Periods: s method - ew Delhi, 1 and Distrik Publishers , Pearson	of rate of set  - laboratory , Line load an  09  r strength - Di  tion.  09  Swedish circle  Total Period  7th Edition, utors, New I  Distribution  Education, Ii	rect shear, method – ds: 45 (2017). Delhi, 7th	CO4 CO5 Edition			
ind log t methods compaction. Stress of New marks influ UNIT – IV Shear strength of criaxial compression.  UNIT – V Introduction- slopestability number-Sleet Books Punmia B.C. Arora, K.R., 2017(Reprint Worth, V.N., 2014. Purushotham Varghese, P. Reference Book	s- e-log s distribu ence che SHEAI cohesive on, UCC SLOPI s failure ope stab s: 45 , "Soil Me c). S., "Tex na Raj. I C."Four	p relation in heart.  R STRE and cohe and Van E STAB stability – implication in the coherent control of the coherent control of the coherent cohere	onship — laboratory test — omogeneous and isotropic NGTH esion less soils — Mohr-Coue shear tests — Pore pressilLITY of infinite slope — landslide proving slope stability by retutorial Periods: — es and Foundations", Last and Foundation Engine of Soil Mechanics and Foundations and Foundation Engine Engineering", Prentice H	pre consolidate medium – Boundarium – Boundarium – Boundarium – Boundarium bullomb failure the ure parameters  es-Finite slope a inforcement and Practical practical practical practical properties of the propert	eory – M – Cyclic analysis - d confine al Perio ns Pvt. ard Pub neering ng", 2nd vate Lir	easuren mobility Bishopement ds: - Ltd., Nelishers ", CBS Editionnited, N	Periods: nent of sheat — Liquefact Periods: s method - ew Delhi, 1 and Distrib Publishers , Pearson lew Delhi,	of rate of set  - laboratory , Line load an  09  r strength - Di tion.  09  Swedish circle  Total Period  7th Edition, outors, New I  Distribution  Education, Ii  2005	rect shear, method – ds: 45 (2017). Delhi, 7th	CO4 CO5 Edition			
ind log t methods ompaction. Stress of New marks influ UNIT – IV Shear strength of criaxial compression UNIT – V Introduction- slopestability number-Slecture Period ext Books  Punmia B.C. Arora, K.R., 2017(Reprint) Murthy, V.N. 2014. Purushotham Varghese, P. eference Books  Venkatramais	s- e-log s distribu ence cha SHEAI cohesive on, UCC SLOPI s failure ope stab s: 45 , "Soil Me t) S., "Tex na Raj. I C. "Four s ah.C., "(	p relation in heart.  R STRE and cohe and Van E STAB - stability - implication in the cohenics  t book of the cohenics  The cohenics of the cohenics of the cohenics  The cohenics of the cohe	onship — laboratory test — comogeneous and isotropic NGTH  esion less soils — Mohr-Coue shear tests — Pore presson ILITY  of infinite slope — landslide proving slope stability by recoving slope stability slope stability by recoving slope stability by recoving slope stability by recoving slope stability slope	pre consolidate medium – Bound medium – Bound medium – Bound medium – Bound medium balance parameters  es-Finite slope a inforcement and Practical practical practical properties of the propert	eory – M – Cyclic analysis - d confine al Perio ns Pvt. ard Pub neering g", 2nd vate Lir	easuren mobility Bishopement ds: , CBS Edition nited, N	Periods: nent of sheat r - Liquefac Periods: s method - ew Delhi, 1 and Distrib Publishers , Pearson lew Delhi, New Delhi,	of rate of set  - laboratory , Line load an  09  r strength - Di  tion.  09  Swedish circle  Total Period  7th Edition, utors, New I  Distribution  Education, II  2005	rect shear, e method – dis: 45 (2017). Delhi, 7th Ltd., New	CO4 CO5 Edition Delhi.			
compaction. Stress of New marks influ UNIT – IV Shear strength of compaction slopes tability number-Sletteture Period ext Books  Punmia B.C. Arora, K.R., 2017(Reprint Murthy, V.N.S. 2014. Purushotham Varghese, P. Reference Books Venkatramaia Braja M Das,	s- e-log s distribu ence cha SHEAI cohesive on, UCC SLOPE s failure ope stab s: 45 , "Soil Me c). S., "Tex na Raj. I C."Four s ah.C., "( "Princip	p relation in heart.  R STRE and cohe and Van E STAB - stability illity – imp Mechanics t book of Cohes of Cohes of Cohes Cohes of Cohes Cohes of Cohes Cohe	onship — laboratory test — comogeneous and isotropic NGTH esion less soils — Mohr-Coue shear tests — Pore pressibility of infinite slope — landslide proving slope stability by re Tutorial Periods: - es and Foundations", Last and Foundation Engine of Soil Mechanics and Foundations and Foundation Engineering", Prentice Hermical Engineering", New Geotechnical Engineering	pre consolidate medium – Bound medium – Bound medium – Bound medium – Bound medium parameters    Practical practical medium   P	eory – M – Cyclic analysis - d confine Il Perio ns Pvt. ard Pub neering ig", 2nd vate Lir onal Pvi earning	easuren mobility Bishopement ds: , CBS Edition nited, N India F	Periods: Periods: Periods: Periods: Periods: Periods: Periods: S method - Pew Delhi, 1 Publishers Pearson Pew Delhi, Private Lim	of rate of set  I laboratory  Line load an  op  r strength - Di  tion.  op  Swedish circle  Total Period  tutors, New I  Distribution  Education, II  2005	rect shear, e method – dis: 45 (2017). Delhi, 7th Ltd., New	CO4 CO5 Edition Delhi.			
compaction. Stress of New marks influ UNIT – IV Shear strength of criaxial compression UNIT – V Introduction- slopestability number-Slotext Books Punmia B.C. Arora, K.R., 2017(Reprint B.C. Murthy, V.N. 2014. Purushotham Varghese, P. Reference Books Venkatramais Braja M Das, Modi P N, "So	s- e-log s distribu ence cha SHEAI cohesive on, UCC SLOPI s failure ope stab s: 45 , "Soil Me 'Soil Me cohesive con, UCC SLOPI s failure ope stab s: 45  "Soil Me cohesive con, UCC SLOPI s failure ope stab s: 45  "Soil Me cohesive con, "Cohesive c	p relation in heart.  R STRE and cohe and Van E STAB - stability ility – imp Mechanics t book of P., "Soil I ndation I Geotech anics a	onship — laboratory test — omogeneous and isotropic NGTH esion less soils — Mohr-Coue shear tests — Pore pressilLITY  of infinite slope — landslide proving slope stability by re Tutorial Periods: —  cs and Foundations", Last and Foundation Engine ering and Foundation Engine Engineering", Prentice Herical Engineering, New Geotechnical Engineering and Foundation Engineering and Engineering and Engineering and Engineering and	pre consolidate medium – Boundarium – Boundarium – Boundarium – Boundarium en parameters  es-Finite slope a inforcement and Practical Practical Practical Practical Practical Practical India Principal India India Principal India In	eory – M. – Cyclic  analysis - d confine I Perio  ns Pvt. ard Pub  neering g", 2nd  vate Lir  onal Pvi earning I Book I	easuren mobility Bishopement ds: - Ltd., Nelishers ", CBS Edition nited, N	Periods: Periods: Periods: Periods: Periods: Periods: Periods: Semethod - Pew Delhi, 1 Publishers Publishers Periods: Pew Delhi, Private Lim New Delhi	of rate of set  laboratory Line load an  op r strength - Di  tion.  op Swedish circle Total Period tutors, New I Distribution  Education, II 2005	rect shear, method – ds: 45 (2017). Delhi, 7th Ltd., New andia 2013	CO4  CO5  Edition  Delhi.			
compaction. Stress of New marks influit UNIT – IV Shear strength of compaction slopes tability number-Sleet Books Punmia B.C. Arora, K.R., 2017 (Reprint B.C.) Murthy, V.N.S. 2014. Purushotham Varghese, P. Reference Books Venkatramaia Braja M Das, Modi P N, "So	s- e-log s distribu ence cha SHEAI cohesive on, UCC SLOPI s failure ope stab s: 45 , "Soil Me 'Soil Me c). S., "Tex na Raj. I C."Four s ah.C., "( "Princip oil Mech , "Geote	p relation in heart.  R STRE and cohe and Van E STAB - stability – imp Mechanics t book of the cohe of	onship — laboratory test — comogeneous and isotropic NGTH esion less soils — Mohr-Coue shear tests — Pore pressibility of infinite slope — landslide proving slope stability by re Tutorial Periods: - es and Foundations", Last and Foundation Engine of Soil Mechanics and Foundations and Foundation Engineering", Prentice Hermical Engineering", New Geotechnical Engineering	pre consolidate medium – Bound medium – Bound medium – Bound medium – Bound medium parameters  es-Finite slope a inforcement and Practical practical practical properties on Engineering, Standard practice and Practice and Practice and Practice medium properties and Practice medium – Bound properties and Practice prope	eory – M – Cyclic  analysis - d confine al Perio  ns Pvt. ard Pub  neering g", 2nd  vate Lir  onal Pvt earning I Book I s", Prer	easuren mobility Bishopement ds: - Ltd., Ne lishers ", CBS Edition nited, N Ltd., I India F House, ntice Ha	Periods: Per	of rate of set  laboratory  Line load an  op  r strength - Di  tion.  op  Swedish circle  Total Period  tutors, New I  Distribution  Education, II  2005  2017  ited, 8th Edit  2010.  Pvt. Ltd. New	rect shear, e method – ds: 45 (2017). Delhi, 7th Ltd., New hdia 2013	CO4 CO5 Edition Delhi.			

Department of Civil Engineering

Dr.S. SUNDARARAMAN, M. Tech., Pn.L. Professor & Head

Department of Civil Engg
Sri Manakula Vinayagar Engg. Cellega
Madagadipet, Puducherry, India

Web R	eferences	
, <sub>1</sub> 1.	https://nptel.ac.in/courses/105101201/	
2.	https://nptel.ac.in/courses/105103097/	
3.	http://ascelibrary.org/page/books/s-gsp.	
4.	http://nptel.ac.in/courses/105101084/	
5.	http://nptel.ac.in/courses/105106142/	

# COs/POs/PSOs Mapping

COs		Program Outcomes (POs)													Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
1	3	2	1	-	2	1	1	-	-		-	1	3	7 -			
2	3	2	1	1	-	1	1	-	-	-	-	1	3		-		
3	3	2	1	1	-	1	1	-	-	-	-	1	3	-	1		
4	3	2	1	1	-	1	1	-	-	-	-	1	3	1	1		
5	2	2	1	-	-	-	1	9-2	-	-	_	1	3	7 - 7	-		

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

	LLFQ_ples	Continu	uous Asse	ssment Marks (C	AM)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.,
Professor & Head

Department of Civil Enge Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering

En parented Civil Entre Ser Manakuk zineyeget Engg, Cauco Manag suber, Munumpens, John

2-4-7-45

Department	Civil Engineering	Flogia	amme: <b>B.</b>	recii.				
Semester	V	Cours	e Categoi	ry Cod	e: <b>PC</b>	End Semeste	er Exam Ty	pe: <b>TE</b>
Course Code	U23CET508	Period	ds/Week		Credit	Maxim	um Marks	N. C.
		L	Т	Р	С	CAM	ESE	TM
Course Name	Foundation Engineering	3	0	0	3	25	75	100
Prerequisite	Geotechnical Engineering							
	On completion of the course, the stud	dents will be	able to					lapping nest Leve
	CO1 Analyze the method of soil explo			***************************************				К3
Course	CO2 Get knowledge on bearing capaci	ity and testi	ng metho	ds.	***************************************			К3
Outcome	CO3 Select the type of foundation req	uired for th	e soil at a	place	and able	to design		К3
	different types of foundation.							
	CO4 Determine the load carrying capa							К3
	CO5 Gain knowledge about retaining s	structures a	nd Stabili	ty ana	alysis.	,		К3
UNIT – I	SOIL EXPLORATION				Periods			
Site investigation	on – Soil exploration methods- Hand aug	gers and pov	wer drills-	- Wasł	n boring -	samplers-sar	mpling	
method - Spaci	ng and depth of bore holes - Standard P	enetration <sup>-</sup>	Test - Stat	tic Cor	ne Penetra	ation Test - D	Dynamic Co	ne <b>CO1</b>
Penetration Tes	st- Subsurface soundings - Geo physical	method - Pr	eparation	n of so	il investig	ation Report	t.	
UNIT – II	SHALLOW FOUNDATION				Periods			
Classification of	foundation- Types and selection criteri	a Method:	s to deter	mine	bearing ca	pacity- Met	hods to	
				200	_			ı
increase BC-Ter	zaghi Analysis-Codal provision-Factors a	affecting be	aring capa	acity -	Settlemer	it of foundat	ions on	CO2
increase BC-Ter granular and cla	zaghi Analysis-Codal provision-Factors a ay deposits- Seismic considerations in be	affecting be earing capac	aring capa city evalua	acity -: ation.	Settlemer	t of foundat	ions on	CO2
increase BC-Ter	raghi Analysis-Codal provision-Factors a ay deposits- Seismic considerations in be FOOTINGS AND RAFTS	affecting be earing capac	aring capa city evalu	acity -: ation.	Settlemer Periods		tions on	CO2
increase BC-Ter granular and cla UNIT – III Types of Isolate	ry deposits- Seismic considerations in be FOOTINGS AND RAFTS  d footing-Combined footing- Mat found	earing capad	city evalu	ation.	Periods	:12		
increase BC-Ter granular and cla UNIT – III Types of Isolate	Propertion of foundation of fo	earing capad	city evalu	ation.	Periods	:12		CO2
increase BC-Ter granular and cla UNIT – III Types of Isolate distribution -Pro UNIT – IV	Propertion of foundation	dation-Coda	l provisio	ation. n– Cor	Periods ntact pres Periods	:12 sure and set	tlement	соз
increase BC-Ter granular and cla UNIT – III Types of Isolate distribution -Pro UNIT – IV Pile foundations	Properties of the properties o	earing capad dation-Coda undation. riteria- Indiv	ity evalu	n– Cor	Periods Periods ppile carry	:12 sure and set :12 /ing capacity	tlement	соз
increase BC-Ter granular and cla UNIT – III Types of Isolate distribution -Pro UNIT – IV Pile foundations dynamic approa	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found portioning of foundation—design of foundation—design of foundation—selection cach-pile load tests- under reamed piles-lead	earing capad dation-Coda undation. riteria- Indiv	ity evalu	n– Cor	Periods Periods ppile carry	:12 sure and set :12 /ing capacity	tlement	соз
increase BC-Ter granular and cla UNIT – III Types of Isolate distribution -Pro UNIT – IV Pile foundations dynamic approa	Propertion of foundation	earing capad dation-Coda undation. riteria- Indiv	ity evalu	n– Cor	Periods Periods ppile carry	:12 sure and set :12 /ing capacity	tlement	соз
increase BC-Tergranular and clau  UNIT – III  Types of Isolate distribution -Pro UNIT – IV  Pile foundations dynamic approach - Deep compact	Properties of the properties o	earing capad dation-Coda undation. riteria- Indiv IS Codal pro	I provision vidual and visions. N	n- Cor	Periods Periods ppile carry ds to incre	:12 sure and set :12 ying capacity ease pile carr	rtlement /- static and rying capac	соз
increase BC-Tergranular and claunit – III Types of Isolated distribution - Prounit – IV Pile foundations dynamic approadunit – V Active and passing and passing process.	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found operationing of foundation—design of foundation—selection cach-pile load tests—under reamed piles-lition methods—Grouting.  RETAINING WALLS  ive states—Definitions, Rankine's theory	earing capad lation-Coda Indation. riteria- Indiv IS Codal pro	I provision vidual and visions. M	ation. n- Cor d group lethod	Periods Periods ppile carry ds to incre Periods sive soil —	:12 sure and set :12 /ing capacity ase pile carr :12 Earth pressu	rtlement  static and rying capac	co3
increase BC-Tergranular and clau  IVNIT — III  Types of Isolate distribution -Pro  UNIT — IV  Pile foundations dynamic approach - Deep compact  JNIT — V  Active and passive taining walls corovisions.	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found opportioning of foundation—design of foundations—design of foundation—design of foundation—d	earing capad dation-Coda undation. riteria- Indiv S Codal pro v – Cohesion aphical met	I provision vidual and visions. Note the less and hod — Sta	n – Cor d group dethod cohes bility	Periods Periods ppile carry ds to incre Periods sive soil —	:12 sure and set :12 /ing capacity ase pile carr :12 Earth pressu	rtlement  static and rying capac	co3
increase BC-Tergranular and claunit — III Types of Isolated distribution - Prount — IV Pile foundations dynamic approadured to the compact of	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found opertioning of foundation—design of foundations—design of foundation—design of foundation—de	earing capad dation-Coda undation. riteria- Indiv S Codal pro v – Cohesion aphical met	I provision vidual and visions. M	n – Cor d group dethod cohes bility	Periods Periods ppile carry ds to incre Periods sive soil —	:12 sure and set :12 /ing capacity ase pile carr :12 Earth pressu	rtlement r- static and rying capac are on ralls – Coda	co3
increase BC-Tergranular and clau  IVNIT — III  Types of Isolate distribution -Pro  UNIT — IV  Pile foundations dynamic approach - Deep compact  JNIT — V  Active and passive taining walls corovisions.	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found opportioning of foundation—design of foundations—design of foundation—design of foundation—d	earing capad dation-Coda undation. riteria- Indiv S Codal pro v – Cohesion aphical met	I provision vidual and visions. Note the less and hod — Sta	n – Cor d group dethod cohes bility	Periods Periods ppile carry ds to incre Periods sive soil —	:12 sure and set :12 /ing capacity ase pile carr :12 Earth pressu	rtlement r- static and rying capac are on ralls – Coda	cos dity co4
increase BC-Tergranular and claunit – III Types of Isolated distribution - Prounit – IV Pile foundations dynamic approadument – Deep compact JNIT – V Active and passicationing walls corovisions. Lecture Periods Text Books	provided the state of the state	earing capad dation-Coda andation. riteria- Indiv IS Codal pro v – Cohesion aphical met	I provision vidual and visions. Manual and hod – Sta	ation.  n- Con  d group  dethod  cohes  bility a	Periods periods ppile carry ds to incre Periods sive soil — analysis o	:12 sure and set :12 ying capacity ease pile carr :12 Earth pressu f retaining w	re on valls – Coda	cos dity co4
increase BC-Tergranular and clau  UNIT — III  Types of Isolate distribution -Pro UNIT — IV  Pile foundations dynamic approa- Deep compact  UNIT — V  Active and passicetaining walls corovisions.  Lecture Periods  Ext Books  L. Punmia B.C.	provide the provided and provid	lation-Coda Indation.  riteria- Indivis Codal pro  r – Cohesion aphical met  Practic	I provision vidual and visions. Manual eless and hod – Sta	ation.  n- Cor  d group  dethod  cohes  bility a	Periods periods ppile carry ds to incre Periods sive soil — analysis of	:12 sure and set :12 ying capacity ease pile carr :12 Earth pressu f retaining w Total Perio	re on valls – Coda	cos dity co4
increase BC-Tergranular and clau  UNIT – III  Types of Isolate distribution -Pro UNIT – IV  Pile foundations dynamic approadured proper compact JNIT – V  Active and passifetaining walls corovisions.  Lecture Periods  Text Books  L. Punmia B.C.  2. Varghese, P	provided by the state of the st	lation-Coda Indation.  riteria- Indiv IS Codal pro  r – Cohesior aphical met  Practic mi Publicatio Hall of India	I provision vidual and visions. Man less and hod – Starland ons Pvt. L. Private Li	ation.  n— Con d group dethod  cohes billity a  td., Ne	Periods ntact pres Periods ppile carry ds to incre Periods sive soil – analysis of	:12 sure and set :12 /ing capacity ease pile carr :12 Earth pressu f retaining w  Total Perio	re on valls – Coda	cos dity co4
increase BC-Tergranular and clau  UNIT – III  Types of Isolate distribution -Pro UNIT – IV  Pile foundations dynamic approadured proper compact JNIT – V  Active and passifetaining walls corovisions.  Lecture Periods  Text Books  L. Punmia B.C.  2. Varghese, P	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found opertioning of foundation—design of foundation—selection of ach-pile load tests—under reamed piles—tion methods—Grouting.  RETAINING WALLS  ive states—Definitions, Rankine's theory of simple configurations—Culmann's Grouting.  1 Tutorial Periods: 15  "Soil Mechanics and Foundations", Laxura C. "Foundation Engineering", Prentice Foundation Engineering", Prentice Foundation Engineering", Prentice Foundation Engineering and Foundations and Foundations and Foundation Engineering and Foundation Engineering and Foundation Engineering and Foundations and Foundation Engineering and Foundation E	lation-Coda Indation.  riteria- Indiv IS Codal pro  r – Cohesior aphical met  Practic mi Publicatio Hall of India	I provision vidual and visions. Man less and hod – Starland ons Pvt. L. Private Li	ation.  n— Con d group dethod  cohes billity a  td., Ne	Periods ntact pres Periods ppile carry ds to incre Periods sive soil – analysis of	:12 sure and set :12 /ing capacity ease pile carr :12 Earth pressu f retaining w  Total Perio	re on valls – Coda	cos dity co4
increase BC-Tergranular and clau  UNIT – III  Types of Isolate distribution - Pro UNIT – IV  Pile foundations dynamic approact  Deep compact  JNIT – V  Active and passications walls corovisions.  Lecture Periods  Fext Books  L. Punmia B.C.  Varghese, P.  B. Purushotha  Reference Book	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found opertioning of foundation—design of foundation—selection of ach-pile load tests—under reamed piles-lation methods—Grouting.  RETAINING WALLS  ive states—Definitions, Rankine's theory of simple configurations—Culmann's Grouting.  1. **Tutorial Periods: 15**  "Soil Mechanics and Foundations", Laxing C. "Foundation Engineering", Prentice Foundation Engineering", Prentice Foundations  The state of t	lation-Coda Indation.  riteria- Indiv IS Codal pro  r – Cohesion aphical met  Practic mi Publicatio Hall of India on Engineer	I provision vidual and visions. Moreover and hod — Star al Period ons Pvt. L. Private Ling", 2nd	d group dethod cohes bility a s: -	Periods ntact pres Periods ppile carry ds to incre Periods sive soil — analysis of	sure and set  12  ying capacity ase pile carr  12  Earth pressu f retaining w  Total Perio  17th Edition, hi, 2005 n Education	re on valls – Coda	cos dity co4
increase BC-Tergranular and clau  UNIT – III  Types of Isolate distribution -Pro UNIT – IV  Pile foundations dynamic approaction - Deep compactions.  Active and passifetaining walls corovisions.  Active Periods  Ext Books  I. Punmia B.C.  Varghese, P.  B. Purushotha  Reference Book  I. Venkatrama	A provided in the second secon	lation-Coda Indation. Individual Individual Individual Individual Individual Individual Individual India Individual India Indi	I provision vidual and visions. Mon less and hod – Star al Period ons Pvt. L Private Ling", 2nd ational Pvidual ational Pvidual ational Pvidual ational Pvidual ational Pvidual Pvidua	ation.  n— Con d group dethod cohes billity a td., Ne imited l Edition	Periods ntact pres Periods ppile carry ds to incre Periods sive soil – analysis of ew Delhi, l, New Del on, Pearso	:12 sure and set :12 /ing capacity ease pile carr :12 Earth pressu f retaining w  Total Perio 17th Edition, hi, 2005 n Education	re on valls – Coda ods: 60	cos dity co4
increase BC-Tergranular and classification - Property III Types of Isolated distribution - Property III Types of Isolated distribution - Property III Types of Isolated distribution - Property IIII Types of Isolated distribution - Property IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found opportioning of foundation—design of foundation—selection of ach-pile load tests—under reamed piles—tion methods — Grouting.  RETAINING WALLS  ive states—Definitions, Rankine's theory of simple configurations — Culmann's Grouting in the configurations in the configuration in the con	lation-Coda Indation.  riteria- Individes Codal pro  y — Cohesion aphical met  Practic mi Publication dall of India on Engineer y Age Intern ring", secon	I provision vidual and visions. Moreover and hod — Star al Period ons Pvt. L. Private Ling", 2nd ational Pvd d Edition	ation.  n— Con  d group  dethod  cohes  bility a  td., Na  imited  Edition  vt. Ltd  Stand	Periods ntact pres Periods ppile carry ds to incre Periods sive soil — analysis of ew Delhi, I, New Del on, Pearso I, New Del lard Book	sure and set  :12  ying capacity ease pile carr  :12  Earth pressu f retaining w  Total Perio  17th Edition hi, 2005 n Education  Ihi, 2017 House, New	re on valls – Coda ods: 60	cos dity co4 Co5
increase BC-Tergranular and clauNIT – III Types of Isolate distribution - Pro UNIT – IV Pile foundations dynamic approactions and passive taining walls corovisions. Lecture Periods Fext Books L. Punmia B.C. L. Varghese, P.B. Purushotha Reference Book L. Venkatrama Modi P N, "5 L. Coduto, D.P.	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found opertioning of foundation—design of foundation—selection of ach-pile load tests—under reamed piles-lation methods—Grouting.  RETAINING WALLS  ive states—Definitions, Rankine's theory of simple configurations—Culmann's Grafts  : 45	lation-Coda Indation.  riteria- Indivision Codal pro  r — Cohesion aphical met  Practic mi Publication India on Engineer  r Age Interning", second Practices	ity evaluations of provisions. Note that the provisions of the provisions of the provisions of the private Ling", 2nd the Ling", 2n	ation.  n— Con  d group  dethod  cohes  bility a  td., Na  imited  Edition  vt. Ltd  Stand	Periods ntact pres Periods ppile carry ds to incre Periods sive soil — analysis of ew Delhi, I, New Del on, Pearso I, New Del lard Book	sure and set  :12  ying capacity ease pile carr  :12  Earth pressu f retaining w  Total Perio  17th Edition hi, 2005 n Education  Ihi, 2017 House, New	re on valls – Coda ods: 60	co3 dity co4 Co5
increase BC-Tergranular and classification - Produnt - IV  Pile foundations dynamic approadured - Deep compacture - V  Active and passifications walls corovisions.  Lecture Periods  Ext Books  L. Punmia B.C.  Varghese, P.  B. Purushotha  Reference Book  L. Venkatrama  Modi P N, "S.  L. Modi P N, "S.  L. Modi P N, "S.  L. Michael A. J.	FOOTINGS AND RAFTS  d footing-Combined footing- Mat found opportioning of foundation—design of foundation—selection of ach-pile load tests—under reamed piles—tion methods — Grouting.  RETAINING WALLS  ive states—Definitions, Rankine's theory of simple configurations — Culmann's Grouting in the configurations in the configuration in the con	lation-Coda Indation.  riteria- Indiv S Codal pro  r — Cohesior aphical met  Practic mi Publication and Engineer Age Intern ring", second Practices F.N. Spon, 1	ridual and visions. Moreover the second of t	ation.  n— Cor  d group  dethod  cohes  bility a  s: -  td., No  imited  Edition	Periods ntact pres Periods ppile carry ds to incre Periods sive soil — analysis or ew Delhi, New Del n, Pearso , New De lard Book of India Pr	sure and set  12  ying capacity ease pile carr  12  Earth pressu f retaining w  Total Perio  17th Edition hi, 2005 n Education  Ihi, 2017 House, New ivate Limited	re on valls – Coda ods: 60  , 2017.  , India 201  Delhi, 201 d, New Del	CO3 dity CO4 CO5 dity CO4

Dr.S. SUNBARARAMAN, M.Tech., Pa.L.,
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India 2.0.7.46

Web R	eferences
1.	https://nptel.ac.in/courses/105/101/105101083/
2.	https://nptel.ac.in/courses/105105176/
3.	https://nptel.ac.in/courses/105/105/105105039/
4.	https://nptel.ac.in/courses/105107123/
5.	https://nptel.ac.in/courses/114106025/

# COs/POs/PSOs Mapping

со	Progr	am Ou	itcome	s (POs	)		v				1 _1		1	m Speci mes (PS	
S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO1 0	PO1	PO1 2	PSO1	PSO2	PSO3
1	3	3	3	2	-	-	-	-	-	-	-	-	2	2	1
2	3	3	3	2	-	-	-	-	-	-	-	-	1	1	2
3	3	3	3	2	-	-	-	-	-	-	-	-	3	3	2
4	2	-	2	1	3	-	-	-	-	-	-	-	2	2	1
5	1	-	-	2	3	-	-	-	-	-	-	-	3	3	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

	Continu	ous Asses	ssment Ma	rks (CAM)		End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

1. Judamana

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Department of Civil Engineering

Dr.S. SUNBARARARAN, a race real Professor & Heau Bejsathment of Civil Engg

Repartment of Civil Engg FA F.A. &

# **ANNEXURE III**

HIBRUXBIMA

Department		il Engineering	Programme:						
Semester	V		Course Categ	ory Code:	HS	'End S	Semester Ex	am Typ	ре: <b>Т</b>
Course Code	112	BHSTC02	Per	iods/Weel	(		Maximum I		
N.			L	Т	Р	С	CAM	ESE	TN
Course Name	Res	search Methodology	2	0	0	2	25	75	100
		Com	nmon to ALL Branch	nes					L
Prerequisite	Nil								
	On co	ompletion of the course, the	*					LAV	hest
	CO1	Interpret the different types used to address engineering	g problems.					K	
	CO2	Discuss the research probutilize tools and services for	effective information	retrieval.				K	2
Course Outcomes	соз	Apply appropriate methods results using both numerical	to design experimand graphical techni	ents, ana	lyze c	lata, an	d interpret	K	3
	CO4	Analyze and apply ethical dissertations, ensuring acad	guidelines to structu emic integrity and av	re and wi	giarism	1.		K	4
	CO5	Examine the fundamentals them, with emphasis on the engineering.	of intellectual prope	erty rights	to pr	otect a	nd enforce neurship in	K	3
UNIT-I		duction to Research nce of Research, Types of					Periods: 6		
and Oitation iv	Formul	olem Formulation and Litera ating Research Problems, co Basic Techniques. Sources of	onducting a Literatur	e Review	: Esse	ntial Ota	Periods: 6 eps, Refere ne Databas	ncing es.	CO2
ווו-וואכ	Res	earch Methods and Data Ar	nalysis				Periods: 6	L	
Statistics.	Survey	mental Research, Developin s, Basics of Data Analysis:	Numerical and Grap	ic Approa hical Anal	ch. Da ysis, li	oto Coll		hods: ential <b>(</b>	003
JNIT-IV	Writ	ing and Presenting Resear	ch				Periods: 6	L	
Preparing a F Conclusion). Re JNIT-V	ererencii	h Report: Key Sections (, ng and Citation: Brief Overvie	W.	n, Metho	dology	, Resu	ılts, Discus	sion,	CO4
	rotions	s and Intellectual Property	in Research			enta la	Periods: 6		
Introduction to	1 attitie	in Research: Introduction to c, Copyrights, and Trademark Tutorial Periods:	s – Case studies on e	ethical dile	mmas	in resea	arch.		05
ext Books		ratorial Ferious:	Pract	ical Perio	ds: -	Total	Periods: 30		
	, R. Res	search Methodology: A Step-l	ov-Sten Guido for Da	aincar 5	th C-!'	016	E 5		
2. Ram A	huia. R	esearch methods, Rawat Pub	dications 2nd adition	ginners, 5	" Eaiti	on, SAG	E Publication	ons, 20	19.
3. Cresw	ell. J. W	., and Creswell, J. D. Research Edition, SACE Publication	ch Design: Qualitative	2022	_4:	I B # *			
7,00106	acrics, o	th Edition, SAGE Publications	s, 2018.	e, Quantiti	auve, a	ina iviixe	ed Methods		
eference Boo	ks								
	/ Rese	l	<b>7</b>	ne I Inivers	ity Dro	se: 201	1		
1. Thiel D\	1000	arch methods for engineers. (	Jambridge: Cambridg	ge Offivers	oity Fie	33, 2014	т.		
1. Thiel D\ 2. Ganesa	n R. Re	arch methods for engineers. ( search methodology for engir	neers. Chennai: MJP	Publisher	s: 2024	1			
<ol> <li>Thiel D\</li> <li>Ganesa</li> <li>Agarwa</li> </ol>	n R. Re I C, Sha	search methodology for engir rma V. Research methodolog	neers. Chennai: MJP ly in sociology. New i	Publisher Delhi: Con	s; 2024 nmonw	4. /ealth Pi		012.	1
<ol> <li>Thiel D\</li> <li>Ganesa</li> <li>Agarwal</li> <li>Thody A</li> </ol>	n R. Re I C, Sha A. Writin	search methods for engineers. (search methodology for enginerma V. Research methodology and presenting research. 2nd search methodology — methodology — methodology	neers. Chennai: MJP y in sociology. New [ d edition. London: SA	Publisher Delhi: Con	s; 2024 nmonw	4. /ealth Pu	ublishers; 20		1

Dr.S. SUNDARARAMAN, M.Tech., Ph.S..

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. College

Madagadipet, Puducherry, India

#### Web References

- 1. https://conjointly.com/kb/
- 2. https://owl.purdue.edu/owl/research\_and\_citation/conducting\_research/writing\_a\_literature\_review.html
- 3. https://files.eric.ed.gov/fulltext/ED536788.pdf
- 4. https://researcheracademy.elsevier.com/
- 5. https://www.wipo.int/
- 6. https://www.scholastic.com/7-steps-to-successful-research-report.html
- 7. https://www.futurelearn.com/info/courses/business-research-methods- investigation.
- 8. https://articles.manupatra.com/article-details/Patent-Types-Laws-related-to-them-in-India

COs/POs/PSOs Mapping

Course Outcom	РО	РО	РО	РО	РО	РО	РО	РО	РО	PO1	PO1	PO1		gram Sp comes (F	
es (COs)	1	2	3	4	5	6	7	8	9	0	1	2	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	-	2	-	-	2	2	3	3	2	1
CO2	3	1	1	3	1	1	2	-1	-	1	2	- vi	3	2	1
CO3	1	3	3	1	3	-	2	3-1	-	2	2	- 1	3	2	1
CO4	-9-	-	1	2	-		2	3	2	2	-	2	3	2	1
CO5	2	2	2	2	- 2	2	3	3	2	2	3	2	3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

		Contin	uous Asse	ssment Marks (C	AM)	End	T 4 1
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.L...
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department	CIVII	ngineering		Program	me: <b>B.</b> 7	iecii.		T			
Semester	v			Course (	Categor	у Сос	de: ES	End S	Semester	Exam Ty	/pe: TE
<b></b>				Periods	/ Week		Credit		Maximu	m Marks	
Course Code	U23ITT	C02		L	Т	Р		С	CAM	ESE	TM
Course Name		mming in		3	0	0		3	25	75	100
			All Branches)								
Prerequisite	Basic	knowledge	e of Object-Oriented P	rogramming	Princip	les					
	On cor	mpletion o	of the course, the stu	dents will b	e able	to				BT Ma (Highes	apping t Leve
	CO1	Articulate	e the concept of Java	fundamenta	ls, OOP	s and	String	S		K	(2
	CO2	Demons time app	trate the principles of lications	inheritance,	packag	es an	d interf	aces w	ith real	K	(2
Course Outcome	CO3	Create re	eal time applications ι	ising except	ion hand	dling	and thre	ead		H	(3
Outoome	CO4	Build dis	tributed applications u	sing Collect	ions an	d IO s	streams	3			(3
	CO5	Design a	and build simple GUI p	orograms us	ing AW	T, Sw	ings an	d build	databas	e r	(3
Unit- I Intr	oductio	applicati	OHS							Period	s: 09
Variables, Ty Casting (Print OOPs with Class and O Classes.	ypes, Ex mitives t <b>Java:</b> Ir bjects, 0	xpressions to Primitive ntroduction Object Life-	Features – JVM - JRE , Assignment Stateme es), Conditional and Ite to OOPs Concepts - Cycle - Garbage Colle  Methods – StringBuilde	ents, Input/O erative Contr Class – Ob ection-Consti	utput St ol Struc jects – l ructors -	atem tures Metho	ents: So – Arra ods - A	canner/ ys. ccess N	System  Modifiers	ciass, Ty – Creati	ng <b>CO</b>
Variables, To Casting (Print OOPs with Class and O Classes. String: String Unit-II Inh.	ypes, Exmitives to Java: In bjects, Cong Class	xpressions to Primitive ntroduction Object Life- Built-in N to Built-in N	, Assignment Stateme es), Conditional and Ite to OOPs Concepts - Cycle - Garbage Colle Methods – StringBuilde es and Packages	ents, Input/O erative Contr Class – Ob ection-Constr er – String B	utput St ol Struc jects – l ructors - uffer	atemetures Methor this -	ents: So - Array ods - A - static	canner/ ys. ccess M – Array	Modifiers of Object	class, Tyles – Creatilets – Nest	ng CO ed
Variables, Ty Casting (Prir OOPs with Class and O Classes. String: Strin Unit- II Inh Inheritance Polymorphis Interfaces: (Primitives to	ypes, Exmitives to Java: In bjects, Cong Class eritance: Types Sm - Met Define o Objects	xpressions o Primitive ntroduction Object Life Built-in N e, Interfac of Inherita thod overlo - Extend ts vice-vers	Assignment Statements), Conditional and Items), Conditional and Items to OOPs Concepts - Cycle - Garbage Collected and Packages and Packages and Packages and Method ov - Implement - Access): Autoboxing and Assignment - Access): Autoboxing and Assignment - Access	ents, Input/O erative Contr Class – Ob ection-Constr er – String B nip, has-a R erriding – Ab ess - Interfa	utput St rol Struc jects — I ructors - uffer elations ostract (	eatementures Methor- this -	ents: So – Array ods - Array – static super	canner/ ys. ccess M – Array keywor	Modifiers of Object	class, Tylin – Creation – Creation – Nest	ng CO
Variables, Ty Casting (Prin OOPs with Class and O Classes. String: Strin Unit- II Inh Inheritance Polymorphis Interfaces: (Primitives ty Packages:	ypes, Exmitives to Java: In bjects, Cong Class eritance: Types sm - Met Define o Object Define -	cpressions o Primitive otroduction Object Life  - Built-in Me, Interfac of Inheritathod overlo - Extend ts vice-vers - Create -	Assignment Statements), Conditional and Items), Conditional and Items to OOPs Concepts - Cycle - Garbage Collections — StringBuilders and Packages — Is-a Relationsholding and Method ov — Implement — Access — Import	ents, Input/O erative Contr Class – Ob ection-Constr er – String B nip, has-a R erriding – Ab ess - Interfa	utput St rol Struc jects — I ructors - uffer elations ostract (	eatementures Methor- this -	ents: So – Array ods - Array – static super	canner/ ys. ccess M – Array keywor	Modifiers of Object	class, Tylin – Creation – Creation – Nest	ng CO
Variables, Ty Casting (Prir OOPs with Class and O Classes. String: Strin Unit- II Inheritance Polymorphis Interfaces: (Primitives ty Packages: Unit- III Exc Exception and finally — Multithread	ypes, Exmitives to Java: In bjects, Cong Class eritance: Types sm - Mei Define o Object Define - Ception Handling: The street of the congression o	xpressions o Primitive otroduction Object Life- — Built-in N e, Interfact of Inherita thod overlo — Extend ts vice-vers - Create — Handling og: Excepti efined Excepti read — Life	Assignment Statements), Conditional and Items, Conditional and Items to OOPs Concepts - Cycle - Garbage College Allege and Packages ance - is-a Relationsholding and Method ov - Implement - Access): Autoboxing and Access - Import and Multithreading on Hierarchy - Check	ents, Input/O erative Contr Class – Ob ection-Consti er – String B nip, has-a R erriding – At ess - Interfa uto unboxin exed and Unc	utput Struction Structors - uffer elations estract ( aces vs	atemetures Methor this - Chip — Class Abs	ents: So — Arrayods - Araticods - Araticods - Araticodo — staticodo — super — stract competitions	canner/ ys. ccess M – Array keywor lasses, – try, (	Modifiers of Object ord – fina Type C	Perioc Conversio Perioc Perioc Perioc Perioc Perioc Priorities	ng CO ed ls: 09 ns CO ds: 09 ow
Variables, Ty Casting (Prir OOPs with Class and O Classes. String: Strin Unit- II Inheritance Polymorphis Interfaces: (Primitives ty Packages: Unit- III Exc Exception and finally — Multithread	ypes, Exmitives to Java: Ir bjects, Cong Class eritance: Types of Objects Define - Ception Handling: The chroniza	xpressions to Primitive throduction Dbject Life Built-in N to Interfact of Inheritathod overlo - Extend ts vice-vers - Create - Handling teg: Excepti efined Excepti ation - Inter	Assignment Statements), Conditional and Items, Conditional and Items to OOPs Concepts - Cycle - Garbage Collected and Packages and Packages and Method ov - Implement - Access - Import and Multithreading on Hierarchy - Checker - Checker - Defining are -Thread Communicated on Conditional and Communicate and Conditional and Communicate	ents, Input/O erative Contr Class – Ob ection-Consti er – String B nip, has-a R erriding – At ess - Interfa uto unboxin exed and Unc	utput Struction Structors - uffer elations estract ( aces vs	atemetures Methor this - Chip — Class Abs	ents: So — Arrayods - Araticods - Araticods - Araticodo — staticodo — super — stract competitions	canner/ ys. ccess M – Array keywor lasses, – try, (	Modifiers of Object ord – fina Type C	Perioc Conversio Perioc rows, three	ng CO ed ls: 09 ns CO ds: 09 ow
Variables, Ty Casting (Print) Class and O Classes. String: String Unit- II Inheritance Polymorphis Interfaces: (Primitives ty Packages: Unit- III Exc Exception Interfaces: And finally — Multithread Thread Syn Unit- IV Coll Collections Lambda Ex	ypes, Exmitives to Java: In bjects, Cong Class eritance: Types sm - Mei Define o Object Define - Ception Handling: The chronizatilection is: List: Apression s: Strea	xpressions o Primitive otroduction Object Life- — Built-in Me, Interface of Inherita thod overlo — Extend ts vice-vers — Create — Handling ag: Excepti efined Exc aread — Life ation - Inter s and I/O s Array List and Imp.	Assignment Statements), Conditional and Items, Conditional and Items to OOPs Concepts - Cycle - Garbage Collected Actions - StringBuildentes and Packages ance - is-a Relationsholding and Method ov - Implement - Access): Autoboxing and Access - Import and Multithreading on Hierarchy - Check the cycle - Defining are Thread Communicated Streams and LinkedList. Set: In Streams and Characters - Streams and Characters - Constitution - Characters - C	ents, Input/O erative Contr Class – Ob ection-Constr er – String B hip, has-a R erriding – At ess - Interfa uto unboxin  Red and Unc and Running ion  HashSet aric eter Streams	utput Struction Structions - Industrial Structors - Industrial Struc	atemetures Methoritis - this - Class Abs I Excoment	ents: So — Array ods - Array ods - Ar- static - static - static - static - stract c - st	canner/ ys. ccess M – Array keywor lasses, – try, c ypes – ashMal	Modifiers of Object of - fina Type C catch, the Thread	Period Period Period Period Period Period Period Period Resident Period Period Period Period Period Period	ng CO ed ls: 09 l - ns CO ds: 09 ds: 09 ue.
Variables, Ty Casting (Print) Class and O Classes. String: String Unit- II Inheritance Polymorphis Interfaces: (Primitives ty Packages: Unit- III Exc Exception Inheritance And finally — Multithread Thread Syn Unit- IV Coll Collections Lambda Ex	ypes, Exmitives to Java: In bjects, Cong Class eritance: Types of Comparison of Compar	xpressions to Primitive atroduction Dbject Life- Built-in N to Interfact of Inherita thod overlo Extend ts vice-vers Create — Handling teg: Excepti efined Excepti efined Excepti ation - Inter s and I/O s Array List and the Byte the Writer. Of	Assignment Statements), Conditional and Items, Conditional and Items to OOPs Concepts - Cycle - Garbage Collected Actions - StringBuildentes and Packages ance - is-a Relationsholding and Method ov - Implement - Accesa): Autoboxing and Access - Import and Multithreading on Hierarchy - Check and Communicate Communicates and Commu	ents, Input/O erative Contr Class – Ob ection-Constr er – String B hip, has-a R erriding – At ess - Interfa uto unboxin  Red and Unc and Running ion  HashSet aric eter Streams	utput Struction Structions - Industrial Structors - Industrial Struc	atemetures Methoritis - this - Class Abs I Excoment	ents: So — Array ods - Array ods - Ar- static - static - static - static - stract c - st	canner/ ys. ccess M – Array keywor lasses, – try, c ypes – ashMal	Modifiers of Object of - fina Type C catch, the Thread	Period Period Period Period Period Period Period Period Resident Period Period Period Period Period Period	ng CO ed ls: 09 l - ns CO ds: 09 ue.
Variables, Ty Casting (Prince Collections Interfaces: (Primitives to Packages: Unit- III Exception I and finally — Multithread Thread SynUnit- IV Collections Lambda Explice Reader Unit- V GU AWT: ComsWiNG: Sw	ypes, Exmitives to Java: Ir bjects, Cong Class eritance: Types sm - Mei Define o Object Define - Ception Handling: The Chroniza Illection is: List: Appression s: Stream of File Ill and Jill an	xpressions to Primitive throduction Object Life Built-in N to Interfact of Inheritathod overlo - Extend ts vice-vers - Create - Handling Ig: Excepti efined Excepti efined Excepti efined - Life ation - Inter s and I/O s Array List is s. Ims - Byte eWriter. Ob DBC  - Controls Inponents -	Assignment Statements), Conditional and Items, Conditional and Items to OOPs Concepts - Cycle - Garbage Collected Actions - StringBuildentes and Packages ance - is-a Relationsholding and Method ov - Implement - Access): Autoboxing and Access - Import and Multithreading on Hierarchy - Check the cycle - Defining are Thread Communicated Streams and LinkedList. Set: In Streams and Characters - Streams and Characters - Constitution - Characters - C	ents, Input/O erative Contr Class – Ob ection-Consti er – String B hip, has-a R erriding – At ess - Interfa uto unboxin  Red and Unc hd Running ion  HashSet aric eter Streams ject Input Str	utput Struction Structions - Industrial Structors - Industrial Struc	atemetures Methorithis - Thip - Class S Abs I Excement Set. I	ents: So — Array ods - Array ods - Ar- static - static - static - static - stract c - st	canner/ ys. ccess M – Array keywor lasses, – try, c ypes – ashMal	Modifiers of Object of - fina Type C catch, the Thread	Period Period rows, three Period Period Resident Period Period Resident Period Period Resident	ng CO ed   S - CO   S

Dr.S. SUNDARARAMAN, M.Tech., Pa.L.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

#### **Text Books**

- 1. Allen B. Downey and Chris Mayeld, "Think Java How to Think Like a Computer Scientist", 2nd Edition, Green Tea Press, 2020
- Herbert Schildt, "Java: The Complete Reference", TMH Publishing Company Ltd, 11th Edition, 2018.
   H.M.Dietel and P.J.Dietel, "Java How to Program", 11th Edition, Pearson Education/PHI, 2017
- 4. Cay S. Horstmann, Gary Cornell, "Core Java Volume I Fundamentals", 9th Edition, Prentice Hall, 2013.

#### Reference Books

- Sagayaraj, Denis, Karthik, Gajalakshmi, "JAVA Programming for core and advanced learners", Universities Press Private Limited, 2018.
- Poaul Deitel, Harvey Deitel, "Java SE 8 for programmers", 3<sup>rd</sup> Edition, Pearson, 2015.
   P.J. Dietel and H.M Dietel, "Java for Programmers", Pearson Education, 9<sup>th</sup> Edition, 2011.
   Steven Holzner, "Java 2 Black book", Dreamtech Press, 2011.

#### Web References

- 1. https://www.javatpoint.com/java-tutorial
- https://docs.oracle.com/en/java/
- https://www.studytonight.com/java/
- https://onlinecourses.nptel.ac.in/

#### COs/POs/PSOs Mapping

COs	Prog	ram Ou	utcome	es (PO:	s)									am Spec mes (PS	
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	P09	PO10	PO11	PO12	PS01	PSO2	PSO3
1	3	1	1	-	1	-	-	-	- 1	-	(G)	2	3	2	1
2	3	3	3	-	3	-	-		1 - 1	-		2	3	2	1
3	3	3	3	1	3	-	-			-	19-01	2	3	2	1
4	3	3	3	1	3							2	3	2	1
5	3	3	3	1	3		61-04		-			2	3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

A		Continue	ous Assess	ment Marks (CAI	VI)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	1	0	5	5	5	75	100

\*Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M. Tech., Ph.D., Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2.4.7.83

<u> </u>		ngineering		Pro	gramme	e: <b>B.T</b>	ech.				
Semester	V			Cou	ırse Ca	tegory	/ Code:	PC End	Semester	Exam Typ	e: <b>TE</b>
Course Code	U23CE	T508			Perioc	ls/We	ek	Credit	Max	imum Mar	ks
Course Name	Founda	dian Fasia		199	La	T	Р	<u> </u>	CAM	ESE	TM
		ation Engine			3	0	0	3	25	75	100
Prerequisite	Geotec	chnical Engi	neering								
	ļ		he course, the					*		BT Ma (Highes	
Course	CO1 /	Analyze the	method of soil ex ge on bearing ca	xploration ar	nd samp	oling.				K	
Outcome	ii	Select the tv	pe of foundation	required for	the soi	netno	as.	ad able to d	ooian	K	
	C	different type	es of foundation.	a Committee of the same			1 - 1 - 41	iu abie to u	csigii	K	.3
	CO4 [	Determine th	e load carrying o	capacity of p	ile foun	datior	า.			К	3
			dge about retain	ing structure	es and S	Stabilit	y analy	sis.		K	3
UNIT – I		KPLORATIO	nethods- Hand a			7		Periods:09			
Penetration Tes UNIT – II	SHALLO	rface soundi DW FOUND	holes - Standard ngs - Geo physio <b>ATION</b> nd selection crite	cal method -	Prepar	ation	of soil i	nvestigation Periods:09	Report.		e co
ncrease BC-Te	rzaghi An ay deposit	nalysis-Coda	ll provision-Facto considerations in	ors affecting	bearing	capa	acity -Se tion.	ettlement of	foundation	to is on	co
Types of Isolate	d footing	Combined f	ooting Mot four	dation Code			<u>l</u>				T
distribution -Pro	portioning	g of foundati	ooting- Mat foun	ualion-Cou	ai provis	sion–	Contact	pressure a	na settiem	ent	CO
			on-design of for	indation.							
Pile foundations dynamic approa	Introduct	OUNDATION tion- classificated tests- unc	N cation-selection der reamed piles	criteria- Indi	vidual a	nd gro	ouppile	Periods:09 carrying ca p increase p	pacity- stat	ic and g capacity	CO4
Pile foundations dynamic approa - Deep compact JNIT – V Active and passi etaining walls o	Introduction methodice	OUNDATION tion- classific ad tests- un ods – Grouti ING WALLS s –Definitions	N cation-selection der reamed piles ing. s, Rankine's the	criteria- Indi s-IS Codal p	rovision	s. Me	ouppile thods to	carrying ca o increase p Periods:09	bile carrying	g capacity	CO
Pile foundations dynamic approadured Deep compact JNIT – V Active and passiful etaining walls or ovisions.	Introduct ch-pile lo tion meth RETAINI ive states f simple c	OUNDATION tion- classific ad tests- une ods – Grouti ING WALLS a – Definitions configuration	N cation-selection der reamed piles ing. 6 s, Rankine's theo is – Culmann's C	criteria- Indi s-IS Codal p ory – Cohes Graphical me	ion less	and o	ouppile thods to F cohesive	carrying ca o increase p Periods:09 e soil – Earl ysis of retai	th pressure	on Codal	
Pile foundations lynamic approa - Deep compact JNIT – V Active and passi etaining walls o provisions.	Introduct ch-pile lo tion meth RETAINI ive states f simple c	OUNDATION tion- classific ad tests- une ods – Grouti ING WALLS a – Definitions configuration	N cation-selection der reamed piles ing. s, Rankine's the	criteria- Indi s-IS Codal p ory – Cohes Graphical me	rovision	and o	ouppile thods to F cohesive	carrying ca o increase p Periods:09 e soil – Earl ysis of retai	bile carrying	on Codal	
Pile foundations dynamic approa - Deep compact JNIT – V Active and pass etaining walls o provisions. Lecture Periods ext Books	Introduction method RETAINI ive states f simple costs 45	OUNDATION tion- classific ad tests- uncods – Grouti ING WALLS a – Definitions configuration	N cation-selection of the cation of the cati	criteria- Indi s-IS Codal p ory – Cohes Graphical me	ion less ethod –	and o	ouppile ethods to Foohesive lity anal	carrying ca o increase p Periods:09 e soil – Earl ysis of retai	th pressure ning walls	on Codal	
Pile foundations dynamic approadument of the property of the provisions.  In the provisions of the pro	Introduction method ive states f simple constants:	OUNDATION tion- classific ad tests- une ods – Grouti ING WALLS a – Definitions configuration Tuto	N cation-selection of der reamed piles ing. s, Rankine's theous – Culmann's Crial Periods: -	criteria- Indi s-IS Codal p ory – Cohes Graphical me Prac Laxmi Public	ion less ethod –	and of Stabil	puppile bethods to Footnesive lity anales:	carrying ca o increase p Periods:09 e soil – Earl ysis of retai To	th pressure ning walls tal Periods	on Codal	
Pile foundations dynamic approa- JNIT – V Active and passing etaining walls opposite to be provisions. Lecture Periods Ext Books 1. Punmia B.C. 2. Varghese, F	Introduction pile to tion method ive states f simple constants. Soil Medical P.C. "Soil Medical P.C. "Four Introduction method in the pile to the pile	OUNDATION tion- classific ad tests- un ods – Grouti ING WALLS configuration Tuto echanics and	N cation-selection of der reamed piles ing. s, Rankine's theorem of the case o	criteria- Indi s-IS Codal p ory – Cohes Graphical me Prac Laxmi Public ce Hall of Ind	ion less ethod – tical Pe cations l	and of Stabil	pouppile sthods to proper to the structure of the structu	carrying caporate increase periods:09 e soil – Earlysis of retain Too	th pressure ning walls tal Periods	on Codal S: 45	COS
Pile foundations dynamic approa- dynamic approa- Deep compact JNIT – V Active and passicataining walls of provisions. Lecture Periods Ext Books 1. Punmia B.C 2. Varghese, F 3. Purushotha	Introduction method RETAINI ive states f simple constant in the constant in th	OUNDATION tion- classific ad tests- un ods – Grouti ING WALLS configuration Tuto echanics and	N cation-selection of der reamed piles ing. s, Rankine's theous – Culmann's Crial Periods: -	criteria- Indi s-IS Codal p ory – Cohes Graphical me Prac Laxmi Public ce Hall of Ind	ion less ethod – tical Pe cations l	and of Stabil	pouppile sthods to proper to the structure of the structu	carrying caporate increase periods:09 e soil – Earlysis of retain Too	th pressure ning walls tal Periods	on Codal S: 45	COS
Pile foundations dynamic approa Deep compact JNIT – V Active and passi etaining walls o provisions. Lecture Periods Ext Books 1. Punmia B.C 2. Varghese, F 3. Purushotha Reference Book	Introduction pile to tion method iton method iton method ito states of simple constant of the states of simple constant of the states of the s	oundation tion- classific ad tests- un ods – Grouti ING WALLS s –Definitions configuration Tuto echanics and addion Engi P "Soil Mech	N cation-selection of der reamed piles ing. s, Rankine's theory s – Culmann's C rial Periods: - d Foundations", I neering", Prenticulanics and Foundations	criteria- Indi s-IS Codal p ory – Cohes Graphical me Prac Laxmi Public ce Hall of Indi dation Engin	ion less ethod – tical Pe cations l dia Priva eering"	and of Stabiliprocessing Stabi	pouppile thods to provide the cohesive lity analogical section, New mited, Nedition,	carrying car of increase properties of retain the properties of retain the properties of the propertie	th pressure ning walls tal Periods n Edition, 2 005 ducation, In	on Codal S: 45	COS
Pile foundations dynamic approa- dynamic approa- lynamic approa- JNIT – V Active and passicationing walls of provisions. Lecture Periods Ext Books  1. Punmia B.C 2. Varghese, F 3. Purushotha Reference Book 1. Venkatrama	Introduction method ive states f simple constant of the consta	OUNDATION tion- classific ad tests- un ods – Grouti ING WALLS s –Definitions configuration  Tuto echanics and ndation Engi P. "Soil Mech	N cation-selection of der reamed piles ing. s, Rankine's theous – Culmann's Corial Periods: - d Foundations", I neering", Prenticularics and Foundations and F	criteria- Indi s-IS Codal p ory – Cohes Graphical me Prac Laxmi Public ce Hall of Indi dation Engin	ion less ethod –  tical Pecations la Privateering"	and of Stabiliperiods  Pvt. Late Lire, 2nd	pouppile thods to proper the cohesive into analogous the cohesive into analogous the cohesive into analogous the cohesive integration in the c	carrying cap increase periods:09 e soil – Earlysis of retain To v Delhi, 17th lew Delhi, 2 Pearson Ed	th pressure ning walls tal Periods n Edition, 2 005 ducation, Ir	con Codal S: 45	CO
Pile foundations dynamic approa Deep compact JNIT – V Active and pass etaining walls o provisions. Lecture Periods Ext Books 1. Punmia B.C 2. Varghese, F 3. Purushotha Reference Book 1. Venkatrama 2. Modi P N, "S	Introduction method in the control of the control o	OUNDATION tion- classific ad tests- un ods – Grouti ING WALLS s –Definitions configuration  Tuto echanics and addion Engi P. Soil Mech	N cation-selection of der reamed piles ing. s, Rankine's theous – Culmann's Carial Periods: - d Foundations", I neering", Prenticularics and Foundation Engineering", Noundation Engineering	criteria- Indication Engineering", sec	rovision  ion less ethod –  tical Pe cations dia Priva eering"	eriods Pvt. Late Lir, 2nd al Pvt	pouppile thods to thods to the cohesive lity analose:  td., Nevmited, Nedition,  Ltd., Netandari	carrying cap of increase poincrease poincrea	th pressure ning walls tal Periods n Edition, 2 005 ducation, In	e on — Codal —	COS
Pile foundations dynamic approa Deep compact JNIT – V Active and passi etaining walls o provisions. Lecture Periods Ext Books 1. Punmia B.C 2. Varghese, F 3. Purushotha Leference Book 1. Venkatrama 2. Modi P N, "S 3. Coduto, D.P	Introduction pile to tion method pile to tion	oundation tion- classific ad tests- un ods – Grouti ING WALLS s –Definitions configuration Tuto echanics and addion Engi P. "Soil Mech ceotechnical manics and F hnical Engin	cation-selection of der reamed piles ing.  S, Rankine's theorem of the control of	criteria- Indirection of the control	ion less ethod – cations learning errations cond Edees", Pre	eriods  Pvt. Late Lir, 2nd  all Pvt  lition Sentice	pouppile thods to thods to the cohesive lity analose:  td., Nevmited, Nedition,  Ltd., Netandari	carrying cap of increase poincrease poincrea	th pressure ning walls tal Periods n Edition, 2 005 ducation, In	capacity on Codal s: 45 017.	COS
Pile foundations lynamic approa- lynamic approa- Deep compact JNIT – V Active and passi- etaining walls of provisions. Lecture Periods ext Books  1. Punmia B.C. 2. Varghese, F. 3. Purushotha Leference Book 1. Venkatrama 2. Modi P N, "S. 3. Coduto, D.P. 4. Michael A. C. 5. Murthy, V.N.	Introduction method ive states f simple constant of the consta	oundation tion- classific ad tests- un ods – Grouti ING WALLS s –Definitions configuration  Tuto echanics and echanics and echanics and formation Engi P. "Soil Mech Geotechnical manics and F hnical Engine	N cation-selection of der reamed piles ing. s, Rankine's theous – Culmann's Carial Periods: - d Foundations", I neering", Prenticularics and Foundation Engineering", Noundation Engineering	criteria- Indication Engineering", section and Practical a	rovision  ion less ethod –  tical Pe cations l dia Priva eering"  rnationa cond Ed ces",Pre n, 1982	eriods Pvt. Late Lir , 2nd al Pvt lition Sentice	pouppile thods to be the sive of the sive	carrying cap of increase poincrease poincrea	th pressure ning walls tal Periods n Edition, 2 005 ducation, Ir 017 use, New D	con Codal S: 45 017. ndia 2013 elhi, 2017 New Delhi	CO!
Pile foundations lynamic approa- Deep compact JNIT – V Active and passistaining walls orovisions. ecture Periods ext Books 1. Punmia B.C 2. Varghese, F 3. Purushotha eference Book 1. Venkatrama 2. Modi P N, " 3. Coduto, D.P 4. Michael A. C 5. Murthy, V.N. 2014.	Introduction methodic ive states f simple constant in the state of simple constant in the stat	oundation tion- classific ad tests- un ods – Grouti ING WALLS s –Definitions configuration  Tuto echanics and echanics and echanics and formation Engi P. "Soil Mech Geotechnical manics and F hnical Engine	cation-selection of der reamed piles ing.  s, Rankine's theo is – Culmann's Corial Periods: – d Foundations", I neering", Prenticularics and Foundation Engineering Principles ion Practice", E.	criteria- Indication Engineering", section and Practical a	rovision  ion less ethod –  tical Pe cations l dia Priva eering"  rnationa cond Ed ces",Pre n, 1982	eriods Pvt. Late Lir , 2nd al Pvt lition Sentice	pouppile thods to be the sive of the sive	carrying cap of increase poincrease poincrea	th pressure ning walls tal Periods n Edition, 2 005 ducation, Ir 017 use, New D	con Codal S: 45 017. ndia 2013 elhi, 2017 New Delhi	CO!
Pile foundations lynamic approa- lynamic approa- Deep compact JNIT – V Active and passi- etaining walls of provisions. Lecture Periods Ext Books  1. Punmia B.C. 2. Varghese, F. 3. Purushothat Leference Book 1. Venkatramat 2. Modi P N, "S. 3. Coduto, D.P. 4. Michael A. C. 5. Murthy, V.N. 2014.  Veb References	Introduction method iton method iton method iton method iton method iton method iton iton method iton iton iton iton iton iton iton iton	oundation tion- classific ad tests- un ods – Grouti ING WALLS s – Definitions configuration Tuto echanics and addion Engi P "Soil Mech centechnical nanics and F hnical Engin te Investigat	cation-selection of der reamed piles ing.  S, Rankine's theo is – Culmann's Control Periods: –  d Foundations", I neering", Prenticianics and Foundation Engineering Principles ion Practice", E. Mechanics and Foundation Engineering Principles ion Practice and Principles ion Prin	criteria- Indical SelS Codal property – Cohese Graphical me Prace Laxmi Public te Hall of Indical Engineering", section and Practic Self and Practic Self F.N. Sporoundation e	rovision  ion less ethod –  tical Pe cations l dia Priva eering"  rnationa cond Ed ces",Pre n, 1982	eriods Pvt. Late Lir , 2nd al Pvt lition Sentice	pouppile thods to be the sive of the sive	carrying cap of increase poincrease poincrea	th pressure ning walls tal Periods n Edition, 2 005 ducation, Ir 017 use, New D	con Codal S: 45 017. ndia 2013 elhi, 2017 New Delhi	CO!
Pile foundations dynamic approa- lynamic approa- Deep compact JNIT – V Active and passi etaining walls of provisions. Lecture Periods ext Books  1. Punmia B.C 2. Varghese, F 3. Purushotha Reference Book 1. Venkatrama 2. Modi P N, "3 3. Coduto, D.P 4. Michael A. C 5. Murthy, V.N. 2014.  Veb References 1. https://np	Introduction method ion method io	OUNDATION tion- classific ad tests- un ods – Grouti ING WALLS s – Definitions configuration  Tuto echanics and echanics and echanics and fresion Mech Geotechnical nanics and F hnical Engine te Investigat ook of Soil M	cation-selection of der reamed piles ing.  S, Rankine's theo is – Culmann's Crial Periods: –  d Foundations", I neering", Prenticanics and Foundation Engineering Principles ion Practice", E. Mechanics and Foundation Engineering Principles ion Practice and Found	criteria- Indical SelS Codal property – Cohese Graphical me Prace Laxmi Public te Hall of Indical Engineering", section and Practic Self and Practic Self F.N. Sporoundation e	rovision  ion less ethod –  tical Pe cations l dia Priva eering"  rnationa cond Ed ces",Pre n, 1982	eriods Pvt. Late Lir , 2nd al Pvt lition Sentice	pouppile thods to be the sive of the sive	carrying cap of increase poincrease poincrea	th pressure ning walls tal Periods n Edition, 2 005 ducation, Ir 017 use, New D	con Codal S: 45 017. ndia 2013 elhi, 2017 New Delhi	CO!
Pile foundations dynamic approa- beep compact JNIT – V Active and passi etaining walls o provisions. Lecture Periods ext Books  1. Punmia B.C 2. Varghese, F 3. Purushotha Reference Book 1. Venkatrama 2. Modi P N, " 3. Coduto, D.P 4. Michael A. C 5. Murthy, V.N. 2014. //eb References 1. https://np	Introduction methodicon methodico	OUNDATION tion- classific ad tests- un ods – Grouti ING WALLS s – Definitions configuration  Tuto  echanics and addion Engin P. "Soil Mech Beotechnical nanics and F hnical Engin te Investigat ook of Soil M courses/105 courses/105	cation-selection of der reamed piles ing.  s, Rankine's theo is – Culmann's Crial Periods: –  d Foundations", I neering", Prenticianics and Foundation Engineering Principles ion Practice", E. Mechanics and Foundation Engineering Principles ion Practice and Foundation Engineering Principles ion Principles	criteria- Indical Series Codal property — Cohes Graphical me Practical Matter Engine Practical Series and Practical Series F.N. Sporoundation e	rovision  ion less ethod –  tical Pe cations l dia Priva eering"  rnationa cond Ed ces",Pre n, 1982	eriods Pvt. Late Lir , 2nd al Pvt lition Sentice	pouppile thods to be the sive of the sive	carrying cap of increase poincrease poincrea	th pressure ning walls tal Periods n Edition, 2 005 ducation, Ir 017 use, New D	con Codal S: 45 017. ndia 2013 elhi, 2017 New Delhi	COS
Pile foundations lynamic approa- lynamic approa- Deep compact JNIT – V Active and passi- etaining walls of provisions. Lecture Periods Ext Books  1. Punmia B.C. 2. Varghese, F. 3. Purushothat Externate Book 1. Venkatramat 2. Modi P N, "S. 3. Coduto, D.P. 4. Michael A. C. 5. Murthy, V.N. 2014.  //eb References 1. https://np. 2. https://np. 3. https://np.	Introduction from the content of the	oundation tion- classific ad tests- un ods – Grouti ING WALLS s – Definitions configuration Tuto echanics and ndation Engi P. "Soil Mech Geotechnical nanics and F hnical Engin te Investigat ook of Soil M courses/105 courses/105 courses/105	cation-selection of der reamed piles ing.  S, Rankine's theo is – Culmann's Crial Periods: –  d Foundations", I neering", Prenticianics and Foundation Engineering Principles ion Practice", E. Mechanics and Foundation Engineering Principles ion Practice (Foundation Engineering Principles ion Practice) (105/105/105/105/105/105/105/105/105/105/	criteria- Indical Series Codal property — Cohes Graphical me Practical Matter Engine Practical Series and Practical Series F.N. Sporoundation e	rovision  ion less ethod –  tical Pe cations l dia Priva eering"  rnationa cond Ed ces",Pre n, 1982	eriods Pvt. Late Lir , 2nd al Pvt lition Sentice	pouppile thods to be the sive of the sive	carrying cap of increase poincrease poincrea	th pressure ning walls tal Periods n Edition, 2 005 ducation, Ir 017 use, New D	con Codal S: 45 017. ndia 2013 elhi, 2017 New Delhi	COS
Pile foundations dynamic approa- lynamic approa- Deep compact JNIT – V Active and passistaining walls of provisions. Lecture Periods Ext Books  1. Punmia B.C. 2. Varghese, F. 3. Purushotha Leference Book 1. Venkatrama 2. Modi P N, "3 3. Coduto, D.P. 4. Michael A. C. 5. Murthy, V.N. 2014. Leb References 1. https://np 2. https://np 4. https://np 4. https://np	Introduction method items in the content of the con	OUNDATION tion- classific ad tests- un ods – Grouti ING WALLS s – Definitions configuration  Tuto  echanics and addion Engin P. "Soil Mech Beotechnical nanics and F hnical Engin te Investigat ook of Soil M courses/105 courses/105	cation-selection of der reamed piles ing.  s, Rankine's theo is – Culmann's Crial Periods: –  d Foundations", I neering", Prentice and Foundation Engineering Principles ion Practice", E. Mechanics and Foundation Engineering Principles ion Practice and Foundatio	criteria- Indical Series Codal property — Cohes Graphical me Practical Matter Engine Practical Series and Practical Series F.N. Sporoundation e	rovision  ion less ethod –  tical Pe cations l dia Priva eering"  rnationa cond Ed ces",Pre n, 1982	eriods Pvt. Late Lir , 2nd al Pvt lition Sentice	pouppile thods to be the sive of the sive	carrying cap of increase poincrease poincrea	th pressure ning walls tal Periods n Edition, 2 005 ducation, Ir 017 use, New D	con Codal S: 45 017. ndia 2013 elhi, 2017 New Delhi	CO!

Dr.S. SUNDARARAMAN, M.Tech., Ph.:...
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry. India

2. A. 7.84

#### COs/POs/PSOs Mapping

СО					Prog	ram O	utcom	es (PO	s)			5.5	Program Specific Outcomes (PSOs)			
S	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	3	3	2	0 _	α	-	-	-	- 9	ale.		2	2	1	
2	3	3	3	2	-	-	-	-	-	-	10.52	1 . <b></b>	1	1	2	
3	3	3	3	2	-							-	3	3	2	
4	2	-	2	1	3	-	-	-	-	-	-	-	2	2	1	
5	1	-	-	2	3	-	-	-	- ,	-	-	-	3	3	2	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

		Contin	uous Asse	ssment Marks (C	CAM)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, m.Tech., Ph.L.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Department of OWN Engag

Department	Civil	Engineering	Progran	nme: B	.Tech.				
Semester	V		Course	Catego	ry Cod	e: PC En	d Semeste	er Exam Ty	pe: TE
Course Code	11230	ET509	Perio	ods/We	ek	Credit		ximum Ma	
			L	Т	Р	С	CAM	ESE	TM
Course Name	Water Engine	Supply and Wastewater eering	3	0	0	3	25	75	100
Prerequisite	Basic	Civil Engineering							
	On co	mpletion of the course, the stud					A	BT Ma (Highes	
Course Outcome	CO1	Understand the sources and cha	aracteristics (	of water	r			K	
Odtoonie	CO2	Design various treatment metho	ds in water s	upply.	•••••			K	2
	CO3	Design the various distribution n			orage r	methods		K	2
	CO4	Understands the characteristics systems.	of sewage a	nd meth	nod of v	arious sewe	rage	K	
	CO5	Gain knowledge in water manage	ment and W	astewa	ter recv	cle process.		K	2
UNIT – I	SOU	RCES AND WATER SUPPLY face and ground water source- C				Periods:9			
UNIT – II Objectives - Uni of flash mixers,	WATEI it operat Coagula - Deflu	, Geometric methods - Physical, Role of regulatory bodies and Local RTREATMENT METHODS ions and processes - Principles, fation and flocculation - Clariflocci oridation - Softening - Desalination	unctions, and	d design	n of wa	Periods:9 ter treatmen	t plant unit	s, aerators	3
and Maniteriant	e aspec	ets R Storage and distribution							
		e materials - laying, jointing, testi				Periods:9			7
distribution rese	rvoirs –	plumbing system- pumping station	ns and their	operatio	ous of	distributing	water - st	torage and	
אן – וואוכ	PLANN	ING AND DESIGN OF SEWERA	GE SYSTEN			Periods:9			CO3
or separate, sto system and two ilter - septic tan JNIT – V	orm and pipe sy k - sludo SEWAO	s – sewer and sewerage -methods ge systems- quantity of sanitary se combined sewers - sewer appur rstem of plumbing - sanitary fitting ge digestion tank - oxidation pond- GE TREATMENT AND DISPOSAI	ewage - fluctu tenances - tr gs- Principles · oxygen sag L	uation ir raps - p s, functi curve-	n sewag dumbin ions - a aerobic	ge flow - design system of activated sluce reactor- and Periods:9	gn of flow drainage dge unit a aerobic rea	of sewage – one pipe nd trickling actor.	CO4
Sewage farming	g - deep	well injection - Principles, Functi	ons, - Activa	ted Slu	idge Pr	occco Trio	kling filters	s - UASB -	
Construction, Oreatment -Dispo	peration sal of sl	and Maintenance aspects Dis ludge - thickening - dewatering - c	ot sewage scharge star	- Rece	ent Adv	rancoc in C	CHICAGO T.		
ecture Periods	5:45	Tutorial Periods: -	Practica	l Perio	ds: -	To	otal Perio	ds:45	
ext Books	F:								
1. S.K., - "	Environi	mental Engineering I", Khanna Pu	blishers, Nev	w Delhi	, 2016				
2. Modi, P 3. Garq, S	.N., - E	nvironmental Engineering I ", Stan	idard Book F	louse, l	Delhi, 2	016			
3. Garg, S 4. Modi. P	.r., - E	nvironmental Engineering II", Khai	nna Publishe	ers, Nev	v Delhi	, 2016.			
4. Wodi, P	.IN., - E	nvironmental Engineering II", Stan	idard Book F	louse, I	Delhi, 2	018			
	5.5	r Supply and Tracture 1 OD III							
2. Hand bo	ok on M	r Supply and Treatment, CPHEEC	J, Governme	ent of In	dia, Ne	w Delhi, 201	5.		
3. Metcalf a		later Supply and Drainage, SP35,	B.I.S., New	Delhi, 1	1987.				
2010.		dy, M.C., "Wastewater Engineeri						lcGraw Hill	India,
4. Birdie, G	.S. and	Birdie,"Water Supply and Sanitary	/ Engineering	g", Dha	npat Ra	aiand Sons, 2	2016.		

Dr.S. SUNDARARAMAN, M. Fech., Pa.z...
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

#### Web References

- 1. https://onlinecourses.nptel.ac.in/noc20\_ce23/announcements.
- 2. https://swayam.gov.in/nd1\_noc20\_ce23/preview
- 3. https://onlinecourses.nptel.ac.in/noc20\_ce23/announcements
- 4. https://swayam.gov.in/nd1\_noc20\_ce23/preview
- 5. nptel.ac.in/courses/105/104/105104102/

# COs/POs/PSOs Mapping

Cos	D04	200			Program Specific Outcomes (PSOs)										
1	P01	PO2	PO3	P04	PO5	P06	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	2	2	2	2	2	2	3	3	3	3
CO <sub>2</sub>	3	2	2	2	3	2	2	2	2	2	2	2	3	2	3
CO3	3	3	3	3	3	2	2	2	2	2	2	2			
CO4	3	3	3							2	2	3	3	3	3
	3	3	3	3	3	2	2	2	2	2	2	3	3	3	3
CO5	3	3	3	3	3	2	2	2	2	2	2	3	3	3	3

Correlation Level: 1- Low, 2 - Medium, 3 - High

#### **Evaluation Method**

		Contin	uous Asse	ssment Marks (C	AM)	End Semester		
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks	
Marks	5	5	5	5	5	75	100	

\*Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.L... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2.4.7.87

Department		gineering	Prograi	mme: B.	Tech	***************************************			
Semester	V		Course	Catego	ry Code: ES	*End	d Semester	Exam	Гуре:
Course Code	U23ITI	PC02	Peri	ods / We	eek (	Credit	Maxin	num Ma	arks
O N-	Drogra	mming in love Laborate	L	Т	Р	С	CAM	ESE	TM
Course Name	L	mming in Java Laboratory	0	0	2	1	50	50	100
(Common to	All Bran	ches)					<u> </u>		
Prerequisite	Basic o	concepts of Object-Oriented Progra	amming Prin	ciples					
Course Outcome	On com	pletion of the course, the stude		(Hig	lapping ghest evel)				
Outcome	CO1	Apply and practice logical formula applications.						P	₹3
	CO2	Demonstrate the use of inheritan						P	⟨3
	CO3	Implement robust application prog multithreading	grams in Jav	a using	exception ha	andling	and	H	(3
	CO4	Build java distributed applications	using Collec	ctions ar	nd IO stream	IS.		k	<b>(3</b>
	CO5	Implement Graphical User Interfa handling features and Swing in Ja	ce based ap	plication	n programs b	y utiliz	ing event		(3

**List of Exercises** 

- 1. Develop simple programs using java
- 2. Develop a java program that implements class and object.
- 3. Write a java program to find the frequency of a given character in a string
- 4. Write a java program to demonstrate inheritance and interfaces.
- 5. Develop a java program that implements the Packages.
- 6. Create java applications using Exception Handling for error handling.
- Develop a simple real life application program to illustrate the use of Multi-Threads.
- 8. Implement simple applications using Collections.
- 9. Develop application using the concept of I/O Streams
- 10. Write a Java Program to demonstrate AWT and Swing Components
- 11. Develop a simple application and use JDBC to connect to a back-end database.

Lecture Periods:	<ul> <li>Tutorial Periods</li> </ul>	s: -	Practical Periods: 30	Total Periods: 30
Reference Books			<u> </u>	1
<ol> <li>Allen B. Downey a Green Tea Press,</li> </ol>	and Chris Mayeld, "Think 、 2020	Java - Ho	ow to Think Like a Computer S	cientist", 2 <sup>nd</sup> Edition,
<ol><li>Sagayaraj, Denis Universities Press</li></ol>	, Karthik, Gajalakshmi, Private Limited, 2018	"JAVA F	Programming for core and a	advanced learners",

3. Cay.S.Horstmann and Gary Cornell, "Core Java 2", Vol 2, Advanced Features, Pearson Education, 7th Edition, 2010

#### Web References

- 1. http://www.ibm.com/developerworks/java/
- 2. http://docs.oracle.com/javase/tutorial/rmi/.
- 3. IBM's tutorials on Swings, AWT controls and JDBC.
- 4. https://www.edureka.co/blog.
- 5. https://www.geeksforgeeks.org.

\* TE - Theory Exam, LE - Lab Exam

Dr. S. SUNDARARAMAN, M. Toch., Ph. ...

Professor & Head

Department of Civil Engg Q. A.7. &

Sri Manakula Vinayagar Engg. College

# COs/POs/PSOs Mapping

COs				Program Specific Outcomes (PSOs)											
	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3
1	3	2	1	1	3		-1		<b>7</b>		-		3	2	1
2	3	2	1	1	3		-	-	T.	4-1		- 4	3	2	1
3	3	2	1	1	3		-		1.			( <u>1</u> 25	3	2	1
4	3	2	1	1	3					_		j	3	2	1
5	3	2	1	1	3					-	1-14		3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

	C	ontinuous	Assess	ment Marks (CA	M)		
Assessment		nce in prac	tical	Model		End Semester	Total
Assessment Marks	Conductio n of practical	Record work	viva	Practical Examination	Attendance	Examination (ESE) Marks	Marks
	15	5	5	15	10	50	100

Dr.S. SUNDARARAMAN, M.Tech., Ph.2.//
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering

2.A.7.89

Department	Civil E	Engineering	Progran	nme: <b>B.</b>	Tech.					
Semester	V		Course	Categor	y Code	: PC	End	Semest	er Exam	Type:
Course Code	U23CI	=D505	Perio	ds/Wee	k	Cre	dit	Ma	ximum M	arks
	02301	LF 303	L	Т	Р	С		CAM	ESE	TM
Course Name		er and Wastewater Engineering eratory	0	0	2	1		50	50	100
Prerequisite	Nil									
	On co	mpletion of the course, the stude	nts will be			apping st Level)				
Course	CO1	Discuss about importance of water	and its qua	ality ana	lysis.					<b>&lt;2</b>
Outcome	CO2	Analyze various physico-chemical wastewater in case of quality require		cal para	meters	of wate	r and		К3	
	CO3	Assess complete water quality asse	essment fo	EIA an	d dome	estic sup	plies.		K2	
	CO4	Suggest various types of treatment different contaminants.	methods r	equired	to purif	y raw w	ater w	vith	К3	
	CO5	Apply the laboratorial results to pro environmental design.	blem identi	fication,	asic	К3				

#### List of Experiments:

## (i)ANALYSIS OF WATER AND WASTEWATER

#### **PHYSICAL ANALYSIS**

- 1. Measurement of pH
- 2. Measurement of Conductivity
- 3. Determination of Turbidity by using Nephlometer.
- 4. Measurement of Total Solids.
- 5. Estimation of Total Dissolved and Total Suspended solids

## **CHEMICAL ANALYSIS**

- 6. Estimation of Alkalinity.
- 7. Estimation of Hardness.
- 8. Estimation of Chlorides.
- 9. Estimation of Sulphate
- 10. Estimation of Residual Chlorine
- 11. Estimation of Dissolved Oxygen.
- 12. Estimation of Manganese.

## (ii)ANALYSIS OF WASTEWATER

#### **PHYSICAL ANALYSIS**

13. Estimation of Settable solids

#### **CHEMICAL ANALYSIS**

- 14. Determination of optimum coagulant Dosage.
- 15. Estimation of COD

### **BIOLOGICAL ANALYSIS**

16 Estimation of BOD

Le	cture Periods: -	Tutorial Periods: -	Practical Periods: 3 0	Total Periods :30
Re	ference Books			
1.	Manual on Water Sup	ply and Treatment, CPHEEO,	Government of India, New Delhi	, 2015.
2.	Hand book on Water S	Supply and Drainage, SP35, B	I.S., New Delhi,1987.	
3.	Manual on Sewerage	and Sewage Treatment, CPHE	EO, Government of India, New	Delhi, 2013.
4.	Metcalf and Eddy, N	I.C., Wastewater Engineering	- Treatment and Reuse II, 4T	h Edition, McGraw Hill India, 2016
		ards for Drinking Water.		

Dr.S. SUNDARARAMAN, M.Tech., Pa.:.
Professor & Head

IS 2490 Indian Standards for Industrial and sewage effluent discharge

2. A.7.90

# Web References

- 1. <a href="https://swayam.gov.in/nd1">https://swayam.gov.in/nd1</a> noc20 ce23/preview
- 2. https://onlinecourses.nptel.ac.in/noc20 ce23/announcements?force=tru

# COs/POs/PSOs Mapping

COs		أتلا			Prog	ram O	utcom	es (PC	Os)				Program Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO2	PSO3		
CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
CO2	3	2	2	2	3	3	3	3	2	3	2	2	3	2	2		
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
CO4	3	3	3	3	3	3	. 3	3	3	3	3	3	3	3	3		
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

	C	ontinuous	Assess	ment Marks (CA	M)		
Assessment		nce in prac	tical	Model		End Semester	Total
	Conductio n of practical	Record work	viva	Practical Examination	Attendance	Examination (ESE) Marks	Marks
Marks	15	5	5	15	10	50	100

Dr.S. SUNDARARAMAN, M.Tech., Pa.L.,
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Begartment of Clerk of the said the sai

Department	Civil Engineering	Progr	amme :	B.Tech.				
Semester	V	Cours	e Cateo	ory Cod	e: PC E	nd Semeste	er Exam 1	Гуре: LE
Course		Pe	riods/W	eek	Credit	Max	kimum Ma	arks
Code	U23CEP506	L	Т	Р	С	CAM	ESE.	TM
Course Name	REVIT Architecture Laboratory	0	Ō	2	1	50	50	100

Prerequisite	Nil		
	On co	mpletion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Describe building information modeling methodology and its benefits.	K3
Course	CO2	Use different parts of the Revit Architecture user interface and work with different types of architectural elements and families.	K3
Outcomes		Use the different views listed in the Project Browser, control the visibility and graphical	
Satosmos		Representation of objects in architecture model, and work with elevation, section, and 3D views.	K4
	CO5	Set up a project and transfer standards between projects, add and modify levels in project model, createand modify grids.	K4

#### **List of Experiments**

- 1. Introduction
- 2. Basic drawing and Editing Tools
- 3. Setting up levels and Grids
- 4. Modelling walls
- 5. Working with Doors and Windows
- 6. Working with Curtain Walls
- 7. Working with Views
- 8. Adding Components
- 9. Modelling Floors
- 10. Modelling Ceilings and Roofs
- 11. Modelling Stairs and Railing
- 12. 3D modeling of Residential building

	r to order ruler is emailing		
Lecture Periods: -	Tutorial Periods: -	Practical Periods: 30	Total Periods: 30

#### Reference Books

- 1. Shah.M.G., Kale. C.M. and Patki. S.Y., "Building Drawing with an Integrated Approach to BuildEnvironment", Tata McGraw Hill Publishers Limited, 2019.
- 2. Dr. N. Kumaraswamy, A. Kameswara Rao, Charotar Publishing- "Building planning and Drawing", 2017
- 3. Marimuthu V.M., Murugesan R. and Padmini S., "Civil Engineering Drawing-I", Pratheeba Publishers, 2018.

#### Web References

- 1. https://www.google.com/search?q=revit+architecture+tutorialandrlz=1C1CHBD\_enIN877IN877andoq =REVIT+ARCHITECTURE+tandaqs=chrome.1.69i57j0I7.13121j0j8andsourceid=chromeandie=UTF-8
- 2. https://www.youtube.com/watch?v=cJz20pnOGrw
- 3. https://www.pdfdrive.com/revit-architecture-d18827665.html.

Dr.S. SUNDARARAMAN, M.Tech., Pa.a.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadiget, Puducherry, India

# COs/POs/PSOs Mapping

COs		Program Outcomes (POs)									Program S Outcomes		pecific (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	1	-	4-,1	3	-	_	_	3		9/12/1	2	3	3	3
2	3	1			3	15			3	100		3	3	3	3
3	3	1	-	-	3		-		3	-		3	3	3	3
4	3	1	-	-	3		-/	11	3	_		2	3	3	3
5	3	1		-	3	11-	4.		3	-		3	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

	Co	ntinuous	Assess	ment Marks (CA	AM)		
Assessment	Performan cla	ce in pract	tical	Model	enebulh W	End Semester	Total
	Conduction of practical	Record work	viva	Practical Examination	Attendance	Examination (ESE) Marks	Marks
Marks	15	5	- 5	15	10	50	100

Dr.S. SUNDARARAMAN, M. Tech., Ph.1... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department		Engineering	Prog	ramme:	B. Tec	h.					
Semester	V			***************************************		ode: PA	*Fnd Sa	mosta	r Evo	m Tuna.	
Course Code	U23C	EW501					Credit				
Course	-		L	Т	Р	С	CAM	ESE		TM	
Name	Micro	Project	0	0	2	1	100	-		100	
			Civil		.1		<u> </u>				
Prerequisite	Civi	Engineering									
	On co	mpletion of the course, th	e students will	be able	to			T	ВТ	Mapping	
Course	CO1	Identify the problem state				through th	ha litarat		(High	est Level)	
Outcomes	001	survey		o proje	Ct WOIK	u irougii ti	ie ilterat	ure		K2	
Catoonics	CO2	Choose the proper compo	nents as per the	require	ments o	of the deci	an/ ovete			1/0	
	CO3						giii syste	em.		K2	
	003	Apply the acquainted skills	s to develop final	model/s	svstem					КЗ	

There shall be a Micro Project, which the student shall pursue as a team consists of maximum 4 students during the third year, fifth semester. The aim of the micro project is that the student has to understand the real time hardware / software applications. The student should gain a thorough knowledge in the problem he/she has selected and, in the hardware / software he/she using in the Project. The Micro-project is an application that should be formally initiated and should be developed and also to be implemented by the respective team.

The Micro Project shall be submitted in a report form along with the hardware model / software developed, duly approved by the department internal evaluation committee. It shall be evaluated for 100 marks as Continuous Assessment. The department internal evaluation committee shall consist of faculty coordinator, supervisor of the project and a senior faculty member of the department. There shall be two reviews that will be considered for assessing a Micro Project work with weightage as indicated evaluation Methods.

Lecture Periods: -	Tutorial Periods: -	Practical Periods: 30	Total Periods: 30
			1

COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PO	s)				Prog	ram Spe	ecific
	P01	PO2	PO3	P04	PO5	PO6	PO7	PO8	PO9	PO10	DO11	DO40	Outc	omes (P	
1	3	2	2	2				1 00	1 03	FOIU	PUTT	PO12	PS01	PSO2	PSO3
-	3							-	3	3		1	1	1	1
2	3	3	3	2	2	2	2	2	_	2		-	!	1	
2	0								3	3	3	1	2	2	2
3	3	2	2	1	-	2		_	3	3	2	4	_	-	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Method**

Assessment		Review 1			Review 2	4	i V	
AddedSinent	Novelty	Presentation	Viva	Presentation	Demonstration	Viva	Report	Total Marks
Marks	10	20	10	20	20	10	10	100

Dr.S. SUNDARARAMAN, M.Toch., Ph.:..

Professor & Head Q. A. 7.9

Department of Civil Engg

Department	Civil Engineering	Progr	amme: <b>E</b>	3. Tech.				
Semester	V	Cours	e Catego	ry: AEC	End Se	emester E	Exam Ty	pe: -
Course Code	U23CEC5XX	Pe	riods/W	eek	Credit	Max	imum Ma	arks
Course Code	0230E03AA	L	Т	Р	С	CAM	ESE	TM
Course Name	CERTIFICATION COURSE - V	0	0	4	-	100		100

Prerequisite

Students shall choose an International / Reputed organization certification course of 40-50 hours duration specified in the curriculum (It is mandatory to do a minimum of six courses) which will be offered through the Centre of Excellence. These courses have no credit and will not be considered for CGPA calculation.

- (i) Certification Courses are required to be completed to fulfil the degree requirements. All Certification courses are assessed internally for 100 marks.
- (ii) The Course coordinator handling the course will assess the student through attendance and MCQ test, and declare the student as "pass" on satisfactory completion. A letter grade "P" is awarded to declare pass.
- (iii) The marks scored in these courses will not be taken into consideration for the SGPA / CGPA calculations in the grade sheet.

#### **Evaluation Methods**

Assessment	Continuous Assessm	ent Marks (CAM)	T-4-1 M-1
Assessment	Attendance	MCQ Test	Total Marks
Marks	10	90	100

Dr.S. SUNDARARANAIF, M.Tech., Pall.,
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. Cellege Madagadipet, Puducherry, India

Department of Civil Engineering

2 A.7 .95

Department	CIVIL	Engineering			B.Tech.						
Semester	V		Cours MC	e Cateo	gory Code	: End	d Semester Exam Typ t Maximum Mark				
Course Carla	U230	CEM505	Per	iods/W	eek	Credit	Max	imum Mar	ks		
Course Code			L	T	Р	С	CAM	BT Ma (Highesi K:	TN		
Course Name		nce of Indian Traditional wledge	2	0	0	_	100	100 -			
Prerequisite	Nil	Comm	on to AL	L Bran	ches						
- 7 - 4	On c	ompletion of the course, t	the stud	lents w	ill be abl	e to	+				
	CO1	Familiarize with the philoso	ophy of	Indian d	culture						
Course	CO2	Distinguish the Indian lang					K2 lia K2 K2 K2 Periods:06 tance of culture in Periods:06 to current society,				
Outcomes	CO3	Describe the philosophy of				nodern Ind	dia				
	CO4	Illustrate the information al					uia				
	CO5	Describe the contribution of									
UNIT- I	Intro	oduction To Culture	JI SCICITE	1313 01 0	illerent e	i as	Perio	<u>1</u>			
Culture, civiliza	ation, d	culture and heritage, gener	al chara	cteristi	cs of cult	ure, impo	rtance of	culture in			
		an Culture, Ancient India, M							CO1		
UNIT- II	India	an Languages, Culture an	d Litera	ture			Perio	ds:06			
II: Northern Ind		other Sanskrit literature, liter nguages & literature	rature of	south I	ndia India	an Langua	ges and L	₋iterature-	CO2		
UNIT- III		gion and Philosophy					Peri	ods:06			
Movements in	Moder	phy in ancient India, Religion n India (selected movement	ts only)			ieval India	ı, Religiou	is Reform	CO3		
UNIT- IV	Fine	Arts in India (Art, Techno	ology an	ıd Engi	neering)		Peri	ods:06			
		n handicrafts, Music, divisi									
		ndian Architecture (ancient, f science in ancient, mediev				Science	and Tech	nology in	CO4		
UNIT-V	Educ	cation System in India					Perio	ds:06			
Education in an	cient, ı	medieval and modern India,	aims of	educat	ion, subje	cts, langu	ages, Sci	ence and			
Scientists of An	cient I	ndia, Science and Scientists							COS		
Lecture Period		Tutorial Periods: -	Practic	al Peri	ods: -	To	tal Period	ds:30			
<ol> <li>Science in</li> <li>NCERT, "P</li> <li>S. Narain, "</li> </ol>	or, "Te Sams ositior Exam a, "Es	ext and Interpretation: The Ir skrit", Samskrita Bharti Publi n paper on Arts, Music, Dan inations in ancient India", Al sentials of Indian Philosoph 4	isher, IS ice and <sup>-</sup> rva Bool	BN 13: Theatre k Depoi	978-818 3, ISBN 8 4, 1993	24603337 7276333, 1-7450 49	75, 2005 2007 94-X, 200				
Veb Reference	S										
<ul><li>https://nptel.a</li><li>https://nptel.a</li></ul>	ac.in/c ac.in/c	ourses/109/104/109104102 ourses/101/104/101104065 ourses/109/108/109108158	1								
. https://nptel.a	ac.in/c	ourses/109/106/109106059	/								
. HIIDS://notel a	c in/n	oc/courses/noc17/SEM1/no	17 200	11/							

1. Indonesmen

5. https://nptel.ac.in/noc/courses/noc17/SEM1/noc17-ae01/

#### COs/POs/PSOs Mapping

COs	Program Outcomes (POs)											Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3
1	1	-			-	- 18	7.		12.5	3		1	1	-	1
2	1.		7-		-		-	-		3		1	1	-	1
3	1	10 m	-	7 - 1		<b>-</b>		4:44	Table Town	3	- 1	1	1	-	1
4	1		- 1	7 - 1	- 1-11	-		11.	(b) =2(1)	3		1	1		1
5	1					1	-			3		1	1		1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

	Continu			
Assessment	Attendance	MCQ Test	Presentation / Activity / Assignment	Total Marks
Marks	10	30	60	100

Dr.S. SUNDARARAMAN, M. Tech., Pa.L.,

Professor & Head Department of Civil Engg

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

# Semester VI

Semester		Engineering	Programme: B.Tech.									
	VI				ory Code	<u>,</u>		Exam Type: <b>TE</b>				
Course Code	U23C	ET610	Period	s/Week	,	Credit	Maxim		<del>y</del>			
Course Name	<b>D</b>		L	T	P	С	CAM	ESE	TM			
	Desig	n of Steel Structures	3	0	0	3	25	75	100			
Prerequisite	Basic	Structural Design			L							
	On completion of the course, the students will be able to											
	CO1 Understand the design philosophy in simple practical design and behavior of steel structural Joints using bolts and welds.											
Course	CO2	Understand the behavior of tensile	nd sections.	К3								
Outcome	CO3	h laced and										
	CO4	<ul> <li>battened columns.</li> <li>Columns           O4 Know the knowledge of Plastic analysis of beams and simple frames. Able to design flexural member.     </li> </ul>										
	CO5	Understand and design of Industri	al structure	s Purlin	s and Tr	russes.			<b>K</b> 3			
UNIT – I		DUCTION TO LIMIT STATE DESI				Periods:09						
sections - types cover butt joint U <b>NIT – II</b>	and dou	philosophies by limit state and w nections, terminologies, failures in able cover butt joint using bolts and IN TENSION MEMBERS	bolted and welds und	welded er axial	joints, l loading	Design of Jo - Efficiency of Periods:09	ints – lap jo of joints. B	int, sing	gle CO1			
Types of sectio	ns - Des	sign of tension members – single an	d compoun	d sectio	ns – cor	ncept of shea	ar lag - tensi	on splic	es co			
- design of lug JNIT – III	angies.					Y						
	DESIG	ON OF COMPRESSION MEMBERS										
Theory of colur	nne M	lodes of failures. Design of exictly	and accept	ما براامه		Periods:09	1					
Theory of colur of Lacings and	nns – M Battens	lodes of failures, Design of axially a , Design of Column Splices.	and eccenti	rically lo	aded m	embers, Buil	t-up column	s, Desi	gn co:			
UNIT – IV	PLAS	lodes of failures, Design of axially a , Design of Column Splices.	and eccent			embers, Buil	t-up column					
UNIT – IV Plastic analysis of plate girders	PLAS of bear	lodes of failures, Design of axially a , Design of Column Splices. FIC ANALYSIS & FLEXURAL DES ms and simple frames. Design of L	and eccent BIGN aterally sup			embers, Buil	t-up column					
UNIT – IV Plastic analysis of plate girders	PLAS of bea	lodes of failures, Design of axially a , Design of Column Splices. FIC ANALYSIS & FLEXURAL DES ms and simple frames. Design of L	and eccentrications of the second sec	ported	and uns	Periods:09	t-up column 3 am member 3	s. Desi	gn CO4			
UNIT – IV  Plastic analysis of plate girders  UNIT – V  Gantry Girder (I	PLAS of bear INDUS	lodes of failures, Design of axially a , Design of Column Splices. FIC ANALYSIS & FLEXURAL DES ms and simple frames. Design of L	and eccentrications of the second sec	ported	and uns	Periods:09	t-up column 3 am member 3	s. Desi	gn CO4			
UNIT – IV Plastic analysis of plate girders	PLAS of beal INDUS	lodes of failures, Design of axially a , Design of Column Splices. FIC ANALYSIS & FLEXURAL DES ms and simple frames. Design of L	and eccentrications  SIGN  aterally supposes  SSES  pes of roof t	ported	and uns	Periods:09 upported be Periods:09 ent spans- E	t-up column 3 am member 3	s. Desi dead, li	gn CO4			
UNIT – IV  Plastic analysis of plate girders  UNIT – V  Gantry Girder (I  and wind loads  Lecture Perioc  Text Books	PLAS of bear INDUS Design	lodes of failures, Design of axially a period of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of Logical of Logical of Logical of Logical of Purlins - Type Tutorial Periods: -	SIGN aterally supposes of roof to	pported russes f	and uns	embers, Buil Periods:09 upported be Periods:09 ent spans- E	t-up column    am member    stimation of	s. Desi dead, li	gn CO4			
UNIT – IV  Plastic analysis of plate girders.  UNIT – V  Gantry Girder (I  and wind loads  Lecture Period  Text Books  1. Subramaniar	PLAS: of bear indus Design is: 45	lodes of failures, Design of axially a pesign of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LIBERT STRUCTURES AND TRUST Procedure) - Design of Purlins - Typ  Tutorial Periods: -  esign of steel structures", Oxford Periods and Structures a	SIGN aterally supposes of roof to Practicularity	oported russes f cal Perio	and uns	Periods:09 upported be Periods:09 ent spans- E	t-up column  am member  stimation of	dead, li	gn CO4			
UNIT – IV  Plastic analysis of plate girders.  UNIT – V  Gantry Girder (I and wind loads.  Lecture Period  Text Books  1. Subramaniar  2. Shiyekar, M.I	PLAS: s of bear in INDUS Design Inc. is: 45	lodes of failures, Design of axially a possible procedure, Design of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LOGIC ANALYSIS & FLEXURAL DESIGN of LOGIC Procedure and STRICTURES AND TRUST Procedure and Tutorial Periods: -  Tutorial Periods: -  esign of steel structures", Oxford Procedure and Steel Structural Steel",	SIGN aterally suppose of roof to the practical practical practical process of the practical process of the practical	russes f cal Perio	and unsorting or difference ods:  hi, 2007 HI Learn	Periods:09 upported be Periods:09 ent spans- E  T uing Private L	t-up column  am member  stimation of  otal Period	dead, li	gn CO4			
UNIT – IV  Plastic analysis of plate girders.  UNIT – V  Gantry Girder (I and wind loads.  Lecture Period  Text Books  1. Subramaniar  2. Shiyekar, M.I	PLAS: s of bear in INDUS Design Inc. is: 45	lodes of failures, Design of axially a pesign of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LIBERT STRUCTURES AND TRUST Procedure) - Design of Purlins - Typ  Tutorial Periods: -  esign of steel structures", Oxford Periods and Structures a	SIGN aterally suppose of roof to the practical practical practical process of the practical process of the practical	russes f cal Perio	and unsorting or difference ods:  hi, 2007 HI Learn	Periods:09 upported be Periods:09 ent spans- E  T uing Private L	t-up column  am member  stimation of  otal Period	dead, li	gn CO4			
UNIT – IV  Plastic analysis of plate girders UNIT – V  Gantry Girder (I and wind loads Lecture Period Text Books  1. Subramaniar 2. Shiyekar, M.I 3. Bhavikatti, S.	PLAS: of bear inDus Design I is: 45 n, P., "D R., "Lim S., "Design I is: 45	lodes of failures, Design of axially a period of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LICENSES AND TRUST DESIGN OF LICENSES AND TRUST DESIGN OF Purlins - Type Tutorial Periods: -  esign of steel structures", Oxford Period of Steel Structures, IK Internations	SIGN aterally suppose of roof to the practical publishers, Notice to the property of the prope	russes f cal Perio	and unsor difference ods: hi, 2007 HI Learn	Periods:09 upported be Periods:09 ent spans- E  T  sing Private L tt Ltd, New D	t-up column  am member  stimation of  otal Period  td., Delhi, 2	dead, li	gn CO4			
Plastic analysis of plate girders JNIT – V  Plastic analysis of plate girders JNIT – V  Gantry Girder (I and wind loads Lecture Perioc Ext Books  I. Subramaniar C. Shiyekar, M.I B. Bhavikatti, S.  Reference Book I. Shah, V.L., a	PLAS: s of bear in NDUS Design In St. 45 In P., "Design In S., "Lim S., "Design In S., "Design I	lodes of failures, Design of axially a , Design of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of L.  STRIAL STRUCTURES AND TRUST  Procedure) - Design of Purlins - Typ  Tutorial Periods: -  esign of steel structures", Oxford Pit State Design in Structural Steel", sign of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit state design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, "Limit State Design of Steel Structures", IK International Gore, IK Inte	SIGN aterally suppose of roof to the practical publishers, Note that the property of the prope	russes f cal Perio New Del lition, Pl shing H	and uns or difference ods: hi, 2007 HI Learn ouse Pv	Periods:09 upported be Periods:09 ent spans- E  T  sing Private L tt Ltd, New D	t-up column  am member  stimation of  otal Period  td., Delhi, 2	dead, li	gn CO4			
Plastic analysis of plate girders JNIT – V  Plastic analysis of plate girders JNIT – V  Gantry Girder (I and wind loads Lecture Period Text Books  I. Subramaniar S. Shiyekar, M.I B. Bhavikatti, S.  Reference Book I. Shah, V.L., a S. Sai Ram K.S	PLAS: s of bear INDUS Design I Is: 45 In, P., "Design I Is: 45 In In Is: 45 In Is:	lodes of failures, Design of axially a period of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LICENSE AND TRUST Procedure) - Design of Purlins - Type Tutorial Periods: -  esign of steel structures", Oxford Puit State Design in Structural Steel", sign of Steel Structures", IK International Gore, "Limit state design of Steel Structures", Pearson Edgn of Steel Structures (Page 1998)	SIGN aterally supposes of roof to the practic second Editional Publication Ltd.	russes feal Periodellition, Phashing H	and unsor differences  ods:  hi, 2007  HI Learn  ouse Pv	embers, Buil Periods:09 upported be Periods:09 ent spans- E - T  uing Private L tt Ltd, New D	t-up column am member stimation of total Period atd., Delhi, 2 relhi, 2014.	dead, li	gn CO4			
Plastic analysis of plate girders of plate girders of plate girders of plate girder of plate g	PLAS: s of bear	lodes of failures, Design of axially a period of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LICENSE AND TRUST DESIGN of LICENSE AND TRUST DESIGN of Puriod Period	BIGN aterally suppose of roof to the practical publishers, Note of the properties of	russes f leal Perio New Del lition, Pl shing H si", Struc I., 2013. II, Stand	and uns or difference ods: hi, 2007 HI Learn ouse Po	Periods:09 upported be Periods:09 ent spans- E  ing Private Let Ltd, New D  ublications, F	t-up column am member bestimation of otal Period atd., Delhi, 2 delhi, 2014.	dead, li	gn CO4			
Plastic analysis of plate girders JNIT – V  Plastic analysis of plate girders JNIT – V  Gantry Girder (I and wind loads Lecture Period Fext Books  I. Subramaniar L. Shiyekar, M.I B. Bhavikatti, S.  Reference Boo I. Shah, V.L., a L. Sai Ram K.S B. VirendraGeh IIS: 800- 2007	PLAS: s of bear in NDUS Design In	lodes of failures, Design of axially a period of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LICENSE AND TRUST Procedure) - Design of Purlins - Type Tutorial Periods: -  esign of steel structures", Oxford Puit State Design in Structural Steel", sign of Steel Structures", IK International Gore, "Limit state design of Steel Structures", Pearson Edgn of Steel Structures (Page 1998)	BIGN aterally suppose of roof to the practical publishers, Note of the properties of	russes f leal Perio New Del lition, Pl shing H si", Struc I., 2013. II, Stand	and uns or difference ods: hi, 2007 HI Learn ouse Po	Periods:09 upported be Periods:09 ent spans- E  ing Private Let Ltd, New D  ublications, F	t-up column am member bestimation of otal Period atd., Delhi, 2 delhi, 2014.	dead, li	gn CO4			
Plastic analysis of plate girders JNIT – V  Plastic analysis of plate girders JNIT – V  Gantry Girder (I and wind loads Lecture Period Text Books  I. Subramaniar S. Shiyekar, M.I S. Bhavikatti, S.I Reference Book I. Shah, V.L., a S. Sai Ram K.S I. VirendraGeh I.IS: 800- 2007 Web Reference	PLAS's of bear INDUS Design I Is: 45 In, P., "Design I Is: 45 Ind Veel Ind Veel Ind Veel Ind Veel Ind Tester I	lodes of failures, Design of axially a period of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LICENSE AND TRUST Procedure) - Design of Purlins - Type Tutorial Periods: -  esign of steel structures", Oxford Plit State Design in Structural Steel", sign of Steel Structures", IK Internation of Steel Structures", Pearson Edign of Steel Structures", Pearson Edign of Steel Structures and Construction in Steel-Code of Planta Construction in Steel Code of Planta Code in C	BIGN aterally suppose of roof to the practical publishers, Note of the properties of	russes f leal Perio New Del lition, Pl shing H si", Struc I., 2013. II, Stand	and uns or difference ods: hi, 2007 HI Learn ouse Po	Periods:09 upported be Periods:09 ent spans- E  ing Private Let Ltd, New D  ublications, F	t-up column am member bestimation of otal Period atd., Delhi, 2 delhi, 2014.	dead, li	gn CO4			
Plastic analysis of plate girders UNIT – V  Plastic analysis of plate girders UNIT – V  Gantry Girder (I and wind loads Lecture Period Text Books  1. Subramaniar 2. Shiyekar, M.I 3. Bhavikatti, S.I Reference Boo 1. Shah, V.L., a 2. Sai Ram K.S 3. VirendraGeh 4.IS: 800- 2007 Web Reference	PLAS's of bear INDUS Design I Is: 45 In, P., "Design I Is: 45 Ind Veel Ind Veel Ind Veel Ind Veel Ind Tester I	lodes of failures, Design of axially a period of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LICENSE AND TRUST DESIGN of LICENSE AND TRUST DESIGN of Puriod Period	BIGN aterally suppose of roof to the practical publishers, Note of the properties of	russes f leal Perio New Del lition, Pl shing H si", Struc I., 2013. II, Stand	and uns or difference ods: hi, 2007 HI Learn ouse Po	Periods:09 upported be Periods:09 ent spans- E  ing Private Let Ltd, New D  ublications, F	t-up column am member bestimation of otal Period atd., Delhi, 2 delhi, 2014.	dead, li	gn CO4			
Plastic analysis of plate girders. UNIT – V  Plastic analysis of plate girders. UNIT – V  Gantry Girder (I and wind loads. Lecture Perioc Text Books  1. Subramaniar 2. Shiyekar, M.I 3. Bhavikatti, S. Reference Boo 1. Shah, V.L., a 2. Sai Ram K.S 3. VirendraGeh 4.IS: 800- 2007 Web Reference 1. https://nptel.a	PLAS: s of bear in NDUS Design I is: 45 n, P., "D R., "Lim S., "Design I lot, Ran , "Gene es c.in/cou	lodes of failures, Design of axially a period of Column Splices.  FIC ANALYSIS & FLEXURAL DESIGN of LICENSE AND TRUST Procedure) - Design of Purlins - Type Tutorial Periods: -  esign of steel structures", Oxford Plit State Design in Structural Steel", sign of Steel Structures", IK Internation of Steel Structures", Pearson Edign of Steel Structures", Pearson Edign of Steel Structures and Construction in Steel-Code of Planta Construction in Steel Code of Planta Code in C	BIGN aterally suppose of roof to the practical publishers, Note of the properties of	russes f leal Perio New Del lition, Pl shing H si", Struc I., 2013. II, Stand	and uns or difference ods: hi, 2007 HI Learn ouse Po	Periods:09 upported be Periods:09 ent spans- E  ing Private Let Ltd, New D  ublications, F	t-up column am member bestimation of otal Period atd., Delhi, 2 delhi, 2014.	dead, li	gn CO4			

C. Indaesome\_

Department of Civil Engineering

Dr.S. SUNDARARAMAN, M.Tech., Pa.L..
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madaga lipet, Puducherry, India

# COs/POs/PSOs Mapping

COs		Program Outcomes (POs)										Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	3	3	1	-1	7-1	-		-	3	1	3	3	3	3
2	3	3	3	2	1			U+ 1	leg # 11	3	1	3	3	3	3
3	3	3	3	2	1		71431			3		1982119	3	3	3
4	3	3	3	2	1	1-1		-		3		-	3	3	3
5	3	3	3	2	1	11-11	-	-	-	3	T.H _ 180 11		3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

		Continu	End Semester	Total			
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

\*Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M. Tech., Ph. b... Professor & Head Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department	Civil	Engine	ering	Program	me: <b>B.</b>	Гесh.				
Semester	VI			Course	Categor	y Code	: PC "End	d Semeste	r Exam T	ype: TE
				Periods /	Week		Credit	Max	imum M	arks
Course Code	U230	CET611		L	T	Р	С	CAM	ESE	TM
Course Name	Stru	ctural Ar	nalysis	3	0	0	3	25	75	100
Prerequisite	Mecl	nanics o	f Solids							
Course	On co	mpletio	n of the course, the stude	nts will be al	ole to				(Hi	/lapping ghest evel)
Outcome	CO1	Underst	and the principles and assu	imptions of th	e slope	deflect	ion metho	d		K3
	CO2	Analyze	statically indeterminate bea	ams by using	momen	t distrib	ution met	:hod		K3
	>		and the fundamentals of ma							K3
	,		ne stiffness matrix method f							K3
	CO5	Apply in moving	fluence lines to determine	maximum mo	oments,	shears	and rea	ctions due		K3
UNIT-I	Slop		tion Method			P	eriods: 0	9		
Concepts - De	eflection	equatio	n – Joint equilibrium – Lim	itation - Analy	sis of c				al frame	3
without sway -	Non-sv	way analy	/sis							CO1
UNIT-II	Mom	ent Dist	ribution Method			P	eriods: 0	9		<u>l</u>
Definition – Sti	ffness -	- Carry o	ver moment and carry over eams and portal frames wit	factor – Dist	ibution	factor a	at a pinne		at a fixed	CO2
UNIT-III	···········		trix Method	nout sway - N	OII-SWa	······································	eriods: 0	9		
Introduction to	matrix	methods	of analysis - Static indeter	minacy - Con	cept of				terminate	
Dodino With the	ZXIIIIGIII	unce de	grees daing hexibility metho	ou						CO3
UNIT-IV	1		rix Method				eriods: 0			
Matrix stiffness	method	l – Trans	formation of displacements	– Elements	stiffness	to sys	tem - stiff	ness – App	olication	to CO4
continuous bear U <b>NIT-V</b>	ms sup	ports with	maximum three degrees -	- Effects of su	pport se					
			and Influence Lines		<b></b>		eriods: 0			
shear force, be than the span -	conce nding n - Conce	ntrated lo noment – entrated l	oncentrated load moving or oads – Series of concentra Load Position – Absolute m oads – Absolute maximum Breslau's principle and its a	ted Ioads – E naximum Ben Bending Mor	quivaler ding Mo nent an	nt UDL ment ai d Sheai	Influence nd Shear r Force	lines for r Force - UD	eactions L smalle	r CO5
Lecture Period	s: 45		Tutorial Periods: -	Practical F	Periods	: -	T	otal Perio	ds: 45	L
Text Books				1						
4 17 11 41										

- 1. Vaidyanathan R and Perumal P, Structural Analysis, Vol. 1 & 2, Laxmi Publications Pvt. Ltd, New Delhi, 2016, 4th Edition
- 2. Bhavikatti,S.S, Structural Analysis, Vol. 1 & 2, Vikas Publishing House Pvt. Ltd., New Delhi, 2010, 4th Edition
- 3. B.C.Punmia, Ashok Kumar Jain, Arun K. Jain, "Theory of Structures", Laxmi Publications Pvt. Ltd, 2017, 13th Edition
- 4. Arun Shyam, Karuna Basker, Structural Analysis, Medtech Publisher, 2019
- 5. Roy Sujit Kumar, Chakrabarty Subrata, Fundamentals of Structural Analysis: With Computer Analysis and Applications Paperback, S Chand & Company Publisher, 2003, 2<sup>nd</sup> Edition

### Reference Books

- 1. Dr.R.P. Rethaliya, Structural Analysis-I, Atul Prakashan Publisher, 2020
- 2. Dr. Suresh R. Parekar, H.M. Somayya, Structural Analysis- I, Nirali Prakashan Publisher, 2014
- 3. Wang. C. K., Intermediate Structural Analysis, McGraw Hill Publishing Co., Tokyo, Fourth Edition, 2017.
- 4. Jindal, R. L., Indeterminate Structural Analysis, S. Chand and Company. New Delhi, 2000.
- 5. Thandavamoorthy, "Analysis of Structures", Oxford and IBH Publishers, New Delhi.2008

Dr.S. SUNDARARAMAN, M. Toch., Pa.L.

Professor & Head
Department of Civil Engg.
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Department of Civil Engineering

2. 4.7.100

# Web References

- 1. https://nptel.ac.in/courses/105105166/
- 2. https://onlinecourses.nptel.ac.in/noc20\_ce35/unit?unit=50&lesson=51
- 3. https://nptel.ac.in/courses/105101085/

COs/POs/PSOs Mapping

COs						ram O	utcom	es (PC	s)				Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12		PSO2	PSO3
1	2	3	3	1	1		-			_			3	3	3
2	3	3	3	2	1								2		0
3	3	3	3	2	1			-11/2 /-				-	3	3	3
4	3	3	3	2	1				-			-	3	3	3
5	3			2			-	-		-		-1-	3	3	3
3	3	3	3	2	1	-	-		-				3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

# **Evaluation Method**

		Contin	uous As	sessment Mark	s (CAM)	End		
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester	Total Marks	
Marks	1	0	5	5	5	75	100	

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Pa.

Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, Inclia

2. A.7.101

Department		Engineering	Prograi	mme: E	3.Tech.				
Semester	VI		Course	Catego	ory Code	e: <b>PC</b> En	d Semester E	xam Typ	e: TE
Course Code	U23CI	ET612	Periods			Credi	Maxim	um Mar	ks
Course Name	<u> </u>		L	T	P	С	CAM	ESE	TM
	1	portation Engineering	. 3	0	0	3	25	75	100
Prerequisite	1	of Civil and Mechanical Engineer  pletion of the course, the stud		-LI-4				BT M	apping
	ļ	* ,						(Highe	t Leve
	CO1	Understand & Analyze the geor							(2
Course Outcome	CO2	Understand the various test pro	cedures for	highwa	y materia	als and de	sign theories	··÷······	(2
Outcome	CO4	Design the pavement Understand the railway element	ła					··••	2
	CO5	Prepare airport layout and under		arious i	concents	and com	nonente of	<u> </u>	(2
81787 (10184)		harbor	istand the v	arious	concepts	and com	bonents of	1	2
UNIT – I	HIGH	WAY GEOMETRY				Periods:	10		
Illumination Sigh Alignments - Su Formulae and I Summit and Val	nt Distan uper elev Problems	king Sight Distance (OSD), Sight ce [Derivations and Problems in S vation, Widening of Pavements of s] Design of Vertical Alignments e	SSD and OSI on Horizonta	D]- Gra al Curv	dients ar es and <sup>-</sup>	nd its type: Fransition	s, Design of H Curves (Deri	lorizonta	CO1
UNIT – II	**************************************	MENT COMPONENTS AND ANA	LYSIS		i i	Periods:	08		
Calculation of st calculation) UNIT – III	resses -	Types of pavements - Highway - Single layer, Two layer theory,  MENT DESIGN AND MAINTENA	Westergaard	d's thec	ory, Brad	bury theo	ry (Problems	in stress	CO2
lexible pavemer	nt desigr types - I	rs in the design of flexible and ringle (IRC37) and Rigid pavement (IFP) avement failures - Pavement ever IAY ENGINEERING	RC58) (Prob	lems in	design	of flexible	pavement) - method	ations on Highway	соз
and fastenings - cant (Problems)	Gauge - Wider outs - D	elements – Functions, requirement and its types -Coning of wheels - I ning of gauge on curves (Problem Design of turnouts (Problems) – S RT AND HARBOUR ENGINEER	Defects in rai ms) - Transi tations and \	ls - Sup	oer eleva	ition – Car d Shift (Pi	nt deficiency, roblems) - Po ations and ya	negative	
Components of A		Airport organization – Types of air		av orie	ntation -			oblome)	
Basic runway ler Runway Lighting Ports - Requiren Structures- Piers	ngth and - Desigr nents an , Breakv	corrections, Geometric design of n of exit taxiway (Problems), Defin d Classification of Harbors - Dry vaters, Wharves, Jetties, Quays,	Runway (Pr lition of Term and Wet Do Spring Fend	oblems s - Har ocks - L ers Coa	s on Run bors, Po ₋ight Hou astal Shi	way lengt rts, Docks uses, Nav pping	n) Runway M , Littoral Drift, igational Aids	larking – Satellite Coastal	CO5
ecture Periods ext Books	. 45	Tutorial Periods: -	Practica	II Perio	ods: -		Total Period	s: 45	
	1								
		C.E.G and Veeraragavan A. "Higl							
		Arora, "A Textbook of Railway E							
		Highways, Railways, Airport and I	Harbour Eng	ıneerin	g", Scite	ch Publica	itions (India),	Chennai	, 2010
Reference Book		. de la							
		les and Practice of Highway Engi			echnical	Publication	ons, Delhi, 20	19.	
		ngineering", Charotar Publishing				ANGLES I	34X-L		
		e in Docks and Harbour Engineer							100
		s (IRC), "Guidelines for the Desig							
5. Indian Road Revision), IR	C: 58-20	71	n of Plain Jo	inted R	ligid Pav	ements fo	r Highways",	(Third	
	L.	Indaerane		No.					

Dr.S. SUNDARARAMAN, M.Tech., Ph.L. Professor & Head

Department of Civil Engineering

Department of Civil Engg Sri Manakuiz Vinayagar Engg, College Madagadipet, Puducherry, India

#### Web References

- 1. http://www.yorku.ca/yaoguo/tranportation1025/
- 2. http://www. tranportation.cum.edu/~wn0g/2ch6a.pdf
- 3. https://nptel.ac.in/courses/105101087/
- 4. https://nptel.ac.in/courses/105107123/
- 5. https://nptel.ac.in/courses/114106025/

### COs/POs/PSOs Mapping

COs				r bat	Program Specific Outcomes (PSOs)										
	P01	PO2	PO3	PO4	PO5	P06	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	2	-	-		-	=	-			2	2	1
2	3	3	3	2	-	-	-		-	-		-	1	1	2
3	3	3	3	2	·	1 = 1	-				-	-	3	3	2
4	2	-	2	1	3	-	•	-			-		2	2	1
5	1	, -	-	2	3	-	-	y, n <b>=</b> 0	-	-	-	-	3	3	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

		Continu	uous Asse	ssment Marks (C	AM)	End Semester	Total
Assessment	ment CAT 1		Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus.

Dr.S. SUNDARARAMAN, M. Tech., Pa.b., Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering

2.4.7.103

Dep

Department	Civil	Engineering	Programm	e: <b>B.Te</b> c	h		***************************************		
Semester	VI		Course Ca	tegory Co	ode: PC		d Semest	er Exam	Type:
Course Code	11330	EB603	Periods/We	eek			Maximur	n Marks	
			L	Т	Р	С	CAM	ESE	TM
Course Name	Techr	mentation and Sensor nologies for Civil Engineering cations	2	0	2	3	50	50	100
Prerequisite	Nil			<u> </u>	<u> </u>	<u> </u>			
4	On co	mpletion of the course, the st	udents will	l be able	to			(Hig	apping hest vel)
*	CO1	Identify the type of transducer						K	(2
Course	CO2	Create mathematical model of t	ransducer					K	(4
Outcomes	CO3	Identify the various types of ser	nsor					к	(2
	CO4	Identify and understand the erro	ors in senso	or and Tra	nsducer	S		•	(4
	CO5	Identify and understand Charact					ues	ļ	(4
UNIT-I	Introd	uction					Perio	ds: 10	
Piezoelectric se transducers, pie	Integrations in the Integral i	ated Sensing for Smart Infrast Principle of piezoelectricity, ric transducers for SHM, Bonding perties of optical fibres, common stomagnetic Diagnostics for S	piezoelectr g effects, lin n optical fibe	nitations, er sensors	Applicat	rication ions.	Period Period	oelectric	CO2
methods, AE eq Electromagnetic the role of micro elastomagnetic s	on Senuipment Sensor structur stress s	sors: Fundamentals of AE tec t technology, Field applications, rs: magnetics and magnetic mate re in magnetization and magneto ensor.	hnique, Inte SHM using erials, magr pelasticity, t	erpretation AE. netoelasti emperatu	city, mag	anetic s	s, AE loc ensor tech	alization nnology	CO3
JNIT-IV	Calibr	ation and Characterization of	Sensors a	nd Trans	ducers		Perio	ds: 15	
<ol> <li>calibration</li> <li>Character</li> <li>Character</li> </ol>	on of R7 eristics eristics	nmeter and voltmeter  TD, thermistor and thermocouple  of potentiometer.  of LVDT  ement measurement using a cap		ısducer		8			CO4
INIT-V	Chara Transo	cterization and Measurement	Technique	s Using A	Advance	ed	Period	ds: 15	
<ol> <li>Characte</li> <li>Characte</li> <li>Pressure</li> <li>Measure</li> </ol>	eristics of eristics of measument of	of load cell.  of optical transducers.  Irement using piezoelectric trans  f current, voltage and power usir  of Strain gauge.	ducers. ng hall effec	et transdud	cer.			-	CO5
ecture Periods	: 30	Tutorial Periods: -	Practical P	eriods: 3	0 1	Total Pe	riods: 60	<u> </u>	

Dr.S. SUNDARARAMAN, M. Tech., Ph.D.,
Professor & Head

Department of Civil Engo Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering

arta ikuwanahanan

# **Text Books**

- 1. Alan S Morris (2001), Measurement and Instrumentation Principles, 3rd/e, Butterworth Hienemann
- 2. David A. Bell (2007), Electronic Instrumentation and Measurements 2nd/e, Oxford Press
- 3. S. Tumanski (2006), Principle of Electrical Measurement, Taylor & Francis.

### Reference Books

- 1. Ilya Gertsbakh (2010), Measurement Theory for Engineers, Springer
- 2. Patranabis, Sensors and Transducers, Second Edition, PHI Publisher
- 3. Ilya Gertsbakh (2010), Measurement Theory for Engineers, Springer

### Web References

- 1. https://onlinecourses.nptel.ac.in/noc20\_ce23/announcements.
- 2. https://swayam.gov.in/nd1\_noc20\_ce23/preview

### COs/POs/PSOs Mapping

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3
CO1	3	3	2	1	2	3	2	1
CO2	2	3	2	2	3	3	3	2
CO3	3	3	3	1	2	3	2	1
CO4	1	2	1	3	3	2	2	1
CO5	2	1	2 .	3	2	1	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Method**

		The second	The	eory		the state of
	Con	tinuous Ass	sessment Marks	(CAM)	End Semester	
Assessment	CAT 1	CAT 2	Model Exam	Attendance	Examination (ESE) Marks	Total Marks
	5	5	5	5	75	-00
Marks	-	20( to be we	ighted for 10 mar	ks)	(to be weighted for 50 marks)	60

Dr.S. SUNDARARAMAN, M.Tech., Ph.L... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department	Civil E	ingineering	Progr	amme :	B.Tech.				
Semester	VI		Cours	e Categ	ory Code	: PC En	d Semester	r Exam <sup>-</sup>	Гуре: <b>LE</b>
Course			Pe	riods/W	eek	Credit	Maxi	mum Ma	arks
Code	U23CI	EP607	L	Т	P	С	CAM	ESE	TM
Course Name	STAA	D PRO V8i LABORATORY	0	0	2	1	50	50	100
Prerequisite	Nil								
	On cor	mpletion of the course, the stud	dents will be	able to	0				apping st Level
	CO1	Understand and design the bas	sic one-dime	nsional	elements			ł	₹3
	CO2	Provide hands on exercise and 2D elements.							<b>≺</b> 3
Course Outcomes	CO3	Provide hands on training on practically.						•	<b>&lt;</b> 4
	CO4	Completing this course would an entire G+2 (floor) buildings.							₹3
	CO5	Completing this course would wind and seismic loading in but			ctical kno	wledge o	n applying	-	<b>K</b> 3

### LIST OF EXPERIMENTS

### **One -Dimensional Elements**

1. Analysis & Design of 2D Truss

#### **Two Dimensional Elements**

- 2. Analysis & Design of 2D Frame subject to pure vertical load.
- 3. Analysis & Design of 2D Frame subjected to both vertical & horizontal loads.

# **Three-Dimensional Elements**

- 4. Analysis & Design of Different types of Beams.
- 5. Analysis & Design of Rectangular & Circular Columns.
- 6. Analysis & Design of 3D Frames
- 7. Analysis & Design of Isolated Footings.
- 8. Analysis & Design of Retaining Walls.
- 9. Analysis & Design of One Way and Two-Way Slabs.

# **Building Design**

10. Creating model, performing analysis and design a G+2 framed structure.

### **External Forces in Building Design**

- 11. Introduction to the general principles for earthquake design.
- 12. Calculation of the lateral force by manual method as well as by analytical method.

Lecture Periods: —	Tutorial Periods: —	Practical Periods: 30	Total Periods: 30
Reference Books	<i>t</i>		
Staad Pro V8i for Beginne	ers: With Indian Examples by T	. S. Sharma, Notion Press Media	Pvt Ltd.

### Web References

- 1. STAAD Pro V8i Technical Reference Manual Bentley Communities.
- 2. https://bentleysystems.service-now.com/community?id=community\_forum&sys\_id=f420bf06475e31109091861f536d43f6
- 3. https://www.youtube.com/results?search\_query=staad+pro+tutorials
- 4. https://learnstaad.com/

Dr.S. SUNDARARAMAN, M.Tech., Pa.:...
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

# COs/POs/PSOs Mapping

C Os	Prog	ram O	utcom	es (PO	s)								Program Specific Outcomes (PSOs)			
US	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	1	- r-		3	-	-	-	3	-	-	2	3	3	3	
2	3	1	-	-	3		Mr. and		3	31 P _ 11 p	F- 2-F	3	3	3	3	
3	3	1		-	3				3		-	3	3	3	3	
4	3	1	-	-	3	-	-	-	3	-	-	2	3	3	3	
5	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Method**

	. Co	ntinuous	Assess	ment Marks (CA	AM)		Jahr F.
Assessment	Performan cla	ce in prac	tical	Model		End Semester Examination	Total Marks
	Conduction of practical	Record work	viva	Practical Examination	Attendance	(ESE) Marks	IVIATKS
Marks	15	5	5	15	10	50	100

Dr.S. SUNDARARAMAN, M.Tech., Pn.D.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Civil E										
VI		······	e: <b>PS</b> End Semester Exam Tv							
11230	`ED608	<del>-</del>		·	•••••	Maximum Marks				
0230	, LI 000	L	T	P	С	CAM	ESE	TM		
Trans	Transportation Engineering Laboratory 0 0 2 1 50									
Basic	Basic of Civil and Mechanical Engineering									
On co	empletion of the course, the student	s will be	e able to	)				lapping		
CO1	Carry out the test on aggregate			***************************************				K3		
CO2	Conduct the test on bitumen			•••••			K3			
CO3	CO3 Design the pavement									
CO4 Investigate the test on bituminous mix								K3		
CO5 Carry out the test on subgrade soil										
	VI U230 Trans Basic On co CO1 CO2 CO3	U23CEP608  Transportation Engineering Laboratory Basic of Civil and Mechanical Engineering On completion of the course, the student CO1 Carry out the test on aggregate CO2 Conduct the test on bitumen CO3 Design the pavement	VI Cours  U23CEP608 Pe L  Transportation Engineering Laboratory 0  Basic of Civil and Mechanical Engineering  On completion of the course, the students will be CO1 Carry out the test on aggregate CO2 Conduct the test on bitumen CO3 Design the pavement	VI  U23CEP608  Periods/W L T  Transportation Engineering Laboratory  Basic of Civil and Mechanical Engineering  On completion of the course, the students will be able to CO1  Carry out the test on aggregate  CO2  Conduct the test on bitumen  CO3  Design the pavement	VI  U23CEP608  Periods/Week  L T P  Transportation Engineering Laboratory  Basic of Civil and Mechanical Engineering  On completion of the course, the students will be able to  CO1 Carry out the test on aggregate  CO2 Conduct the test on bitumen  CO3 Design the pavement	VI  U23CEP608  Periods/Week L T P C  Transportation Engineering Laboratory Basic of Civil and Mechanical Engineering On completion of the course, the students will be able to  CO1 Carry out the test on aggregate  CO2 Conduct the test on bitumen  CO3 Design the pavement	VI  Course Category Code: PS   End Semester  Periods/Week   Credit   Max  L   T   P   C   CAM  Transportation Engineering Laboratory   0   0   2   1   50  Basic of Civil and Mechanical Engineering  On completion of the course, the students will be able to  CO1   Carry out the test on aggregate  CO2   Conduct the test on bitumen  CO3   Design the pavement	VI Course Category Code: PS End Semester Exam    Periods/Week   Credit   Maximum Maxim		

### Tools on Assessed

- I. Tests on Aggregate:
  - 1. Shape Tests (Elongation index, Flakiness index, Angularity number)
  - 2. Impact test
  - 3. Crushing value
  - 4. Los Angles Abrasion test
  - 5. Specific gravity
  - 6. Water absorption
- II. Tests on Bitumen:
  - 1. Penetration Value
  - 2. Ductility
  - 3. Softening point
  - 4. Flash & fire point
  - 5. Specific gravity
  - 6. Viscosity of cutback Bitumen
- III. Tests on Bituminous Mix
  - 1. Marshall's test on bituminous mixes
  - 2. Bitumen Extraction test by Centrifuge Extractor
- IV. Test on Sub-grade soil
  - 1. C.B.R. Test (on sub grade soil)

cture Periods: -	Tutorial Periods: -	Practical Periods: 30	Total Periods: 30
ference Books			1
Kadiyali L R, "Highwa	ay Engineering", Khanna Book	Publishing Co Pvt Ltd. 2019.	
Kadiyali L R, Principl	es and Practice of Highway Er	ngineering, Khanna Technical Publi	cations, Delhi, 2019
Bureau of Indian Star	ndards (BIS) Publications on F	lighway Materials	
			Revision), IRC: 37-2018
Indian Standard (IS),	Methods of test for soil, Part 1	6 (Second Revision), IS: 2720 (Page	rt 16) – 1987
	ference Books Kadiyali L R, "Highwa Kadiyali L R, Principla Bureau of Indian Star Indian Road Congres	Ference Books  Kadiyali L R, "Highway Engineering", Khanna Book Kadiyali L R, Principles and Practice of Highway Er  Bureau of Indian Standards (BIS) Publications on H  Indian Road Congress (IRC), Guidelines for the De	Tactical Chous. 30

### Web References

- 1. http://vlabs.iitb.ac.in/vlabs-dev/labs/mit bootcamp/transporation lab/labs/index.php
- 2 http://www.nptelvideos.in/2012/12/ transporation\_lab.html
- 3. https://nptel.ac.in/content/storage2/courses/105101087/downloads/Lec-21.pdf
- 4. https://nptel.ac.in/content/storage2/courses/105101087/downloads/Lec-26.pdf
- 5. https://nptel.ac.in/content/storage2/courses/105101087/downloads/Lec-26.pdfhttps://dwgmodels.com

1. Indoorance

Dr.S. SUNDARARAMAN, M.Tech., Pa.L.,
Professor & Head
Department of Civil France

Department of Civil Engg Sri Manakula Vinayagar Engg. Cellege Madagadipet, Puducherry, India

# COs/POs/PSOs Mapping

С	Prog	ram O	utcom	es (PO	s)	,							Progr	am Spe	cific SOs)
Os	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	3	1	-	-	3	-	-	-	3	-	-	2	3	3	3
2	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3
3	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3
4	3	1	-	-	3	-	-	-	3	-	-	2	3	3	3
5	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Method**

	Co	ntinuous A	ssess	ment Marks (CA	(M)		
Assessment	Performan cla	ce in pract asses	ical	Model	Attondones	End Semester Examination	Total Marks
	Conduction of practical	Record work	viva	Practical Examination	Attendance	(ESE) Marks	1177 PG.1
Marks	15	5	5	15	10	50	100

Dr.S. SUNDARARAMAN, M.Tech., Ph.L. Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

> Br.R. SURBARARABAR, etago doc. Department of Civil Engineering

Department	Civil Engineering	Programme : B.Tech.						
Semester	VI	Course Category Code:		e: <b>PC</b> End	d Semeste	er Exam	Гуре: LE	
Course		Pe	riods/W	eek	Credit	Max	kimum Ma	arks
Code	Code U23CEP609		T	P	С	CAM	ESE	TM
Course Name	Survey Camp	0	0	2	1	50	50	100

Prerequisite	Surv	eying and Geomatics	
	On co	ompletion of the course, the students will be able to	BT Mapping (Highest Level)
	CO1	Mastery of modern surveying techniques using Theodolite, Total Station, and GPS for accurate measurements and traverses.	K3
0	CO2	Proficiency in contour mapping through radial tachometric and block leveling methods for terrain analysis.	К3
Course Outcomes	CO3	Practical skills in road and canal alignment surveying with longitudinal and cross-sectional surveys.	К3
	CO4	Competence in building offset and plot location for precise construction planning.	K3
	CO5	Application of astronomical and GPS techniques to determine azimuths and geospatial coordinates.	К3

### **List of Experiments**

- 1. Traverse using Theodolite / Total station
- 2. Contouring
  - Radial tachometric contouring Radial Line at Every 45 Degree and Length not less than 60 Meter on each Radial Line
  - ii. Block Level/ By squares of size at least 100 Meter x 100 Meter atleast 20 Meter interval
  - iii. L.S & C.S Road and canal alignment for a Length of not less than 1 Kilo Meter atleast L.S at Every 30m andC.S at every 90m
- 3. Offset of Buildings and Plotting the Location
- 4. Sun observation to determine azimuth (guidelines to be given to the students)
- 5. Use of GPS to determine latitude and longitude and locate the survey camp location
- 6. Traversing using GPS
- 7. Curve setting by deflection angle

Lecture Periods: -	Tutorial Periods: -	Practical Periods: 30	Total Periods: 30
--------------------	---------------------	-----------------------	-------------------

### Reference Books

- 1. Punmia.B.C., Ashok K.Jain and Arun K Jain , Surveying Vol. I and II, Lakshmi Publications Pvt Ltd, New Delhi, 2016
- 2. Kanetkar.T.P and Kulkarni.S.V, Surveying and Levelling, Parts 1 and 2, Pune Vidyarthi Griha Prakashan, Pune, 2014
- 3. S. K. Duggal, "Surveying, Vol. I and II", 5th Edition, McGraw Hill, 2019.
- 4. Venkatramaiah, Text book of Surveying, University press, New Delhi, 2011
- 5. Subramanian, "Surveying and Levelling", Oxford University Press, 2012

### Web References

- 1. https://landsurveyorsunited.com/forum/topics/best-software-to-used-in-surveying
- 2. https://www.capterra.com/survey-software/
- 3. https://nptel.ac.in/courses/105/107/105107157/
- https://nptel.ac.in/courses/105/107/105107122/
- . https://www.youtube.com/watch?v=d\_DoEB4zWEQ

Dr.S. SUNDARARAMAN, M.Tech., Pn.Z.,
Professor & Head
Department of Civil Engg
Sri Manakula-Vinayagar Engg. College
Madagadipet, Puducherry, India

# COs/POs/PSOs Mapping

С	Program Outcomes (POs)											Progr	am Spe mes (P	cific	
Os	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1	PO1 2	PSO 1	PSO 2	PSO 3
1	3	3	-	3	-		-	-	-	2	2	2	3	3	3
2	3	3	DL_HG	3	3	4424	e dina	THE P	-	2	2	3	3	3	3
3	3	3	2	3	3	-	-	-		2	2	3	3	3	3
4	3	3	2		3	-	-	-	1	2	2	2	3	3	3
5	3	3	2	Share:	3	TO E IS			1 L	2	2	3	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Method**

	Co	ntinuous /	Assess	ment Marks (CA	AM)	eraliceal Squite	
Assessment	Performand cla	ce in pract asses	ical	Model		End Semester	Total
	Conduction of practical	Record work	viva	Practical Examination	Attendance	Examination (ESE) Marks	Marks
Marks	15	5	5	15	10	50	100

Dr.S. SUNDARARAMAN, M.Tech., Ph.b.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet. Puducherry, India

2. A.7.11)

Department	Civil E	ngineering Programme: B. Tech.							
Semester	VI		Course Category Code: PA End Semeste				er Exam Type: -		
Course	112301	EW602	Pe	riods / V	Veek	Credit	·		
Code	02001		L L	Т	Р	С	CAM	ESE	TM
Course Name	Mini P	Project	0	0	2	120	100	1 .	100
			CIVIL	•••••	· <b>L</b>			<u> </u>	
Prerequisite	Civil	Engineering, C Program	ming	•••••••••••					
	On c	ompletion of the course,							BT Mapping (Highest Level)
Course	CO1	Identify the problem statement for the mini project work through the literature survey							K2
Outcomes	CO2 Choose the proper components as per the requirements of the design/ system.							em.	K2
	CO3	CO3 Apply the acquainted skills to develop final model/system							

There shall be a Mini Project, which the student shall pursue as a team consists of maximum 4 students during the third year, fifth semester. The aim of the mini project is that the student has to understand the real time hardware / software applications. The student should gain a thorough knowledge in the problem he/she has selected and in the hardware / software he/she using in the Project. The Mini-project is an application that should be formally initiated and should be developed and also to be implemented by the respective team.

The Mini Project shall be submitted in a report form along with the hardware model / software developed, duly approved by the department internal evaluation committee. It shall be evaluated for 100 marks as Continuous Assessment. The department internal evaluation committee shall consist of faculty coordinator, supervisor of the project and a senior faculty member of the department. There shall be two reviews that will be considered for assessing a Mini Project work with weightage as indicated evaluation Methods.

·······	<del></del>		
Lecture Periods: -	Tutorial Periods: -	Practical Periods: 30	Total Periods: 30

### COs/POs/PSOs Mapping

COs	Program Outcomes (POs)  PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12										Program Spec Outcomes (PS				
	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	2			-		3	3		1	1	1	1
2	3	3	3	2	2	2	2	2	3	3	3	1	2	2	2
3	3	2	2	1	-	2	-	-	3	3	3	1	2	2	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Method**

Assessment		Review 1			Review 2					
	Novelty	Presentation	Viva Presentation		Demonstration	Viva	Report	Total Marks		
Marks	10	20	10	20	20	10	10	100		

Dr.S. SUNDARARAMAN, M.Tech., Ph.z.

Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department	Civil Engineering	Programme: B. Tech.							
Semester	VI	Cours	End Semester Exam Type: -						
0	шоогооху	Pe	Credit	Max	imum Ma	arks			
Course Code	U23CEC6XX	L	Т	Р	С	CAM	ESE	TM	
Course Name	Certification Course - VI	0	0	4		100	-	100	
	at	CIVIL		J	200				
Prerequisite	- 12 1011-02 - 1117-17-17-17-17-17-17-17-17-17-17-17-17								

Students shall choose an International / Reputed organization certification course of 40-50 hours duration specified in the curriculum (It is mandatory to do a minimum of six courses) which will be offered through the Centre of Excellence. These courses have no credit and will not be considered for CGPA calculation.

- (i) Certification Courses are required to be completed to fulfil the degree requirements. All Certification courses are assessed internally for 100 marks.
- (ii) The Course coordinator handling the course will assess the student through attendance and MCQ test, and declare the student as "pass" on satisfactory completion. A letter grade "P" is awarded to declare pass.
- (iii) The marks scored in these courses will not be taken into consideration for the SGPA / CGPA calculations in the grade sheet.

#### **Evaluation Methods**

Assessment	Continuous Assess	Total Marks	
Assessment	Attendance	MCQ Test	Total Walks
Marks	10	90	100

Dr.S. SUNDARARAMAN, M.Tech., Pr.Z..
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg, Cellege Madagadipet, Puducherry, India

Department	Civil E	ngineering	Progra	mme: B	. Tech.				
Semester	VI		Course	Catego	ry: MC	End Sem	ester Exa		
Semester	<u> </u>		Pe	riods/We	eek	Credit		mum Ma	
Course Code	U23CE	EM606	L	T	Р	С	CAM	ESE	TM
Course Name	Gende	er Equality	2	0	0	-	100	-	100
Prerequisite	-								apping
	On co	mpletion of the course, the stud						Le	ghest vel)
	CO1	Describe the general identity, soc	ial construc	ion of g	ender ro	les.			<b>&lt;</b> 2
Course	CO2	Illustrate the causes and issues of	of gender dis	criminat	tion in In	dian socie	ty.		<b>K2</b>
Outcomes	CO3	Describe the workplace discrimin	ation, media	influen	ces on g	ender and	culture.		K2
	CO4	Familiarize with international and	Indian fram	eworks	on gend	er equality	•		K2
	CO5 Illustrate the current challenges in gender equality, including the glass ceiling and								K2
UNIT – I	Intro	Juction to Gender Equality				Period			T
Gender equal roles and norn	ity – exp	general equality.	CO1						
LINUT II	Gend	er Inequality and Its Manifestati	ons			Period	15:06		T
	ocial beli ucation	n in Indian society – causes of g iefs, practice and custom – Issues and health, violence and exploitati ler and Culture	of deliger of	Scrimina	don – o	Period			
NA/	cerimins	ation, Media influences on gende ing gender equality and cultural ur	r and cultur	e, Geno	ler and	power dyr	namics in	society.	CO3
LINIT IV	Pron	noting Gender Equality				Perio			
Gender Equa	lity and	Human Rights – International frannstitution – Policies and initiative arious contexts.	neworks and s for gende	l Conve r mainst	ntions of treaming	n Gender I g – Strateg	Equality – gies for p	Equality romoting	CO4
		Challenges and Futur	re Direction	ıs		Perio	ds:06		
Current chall challenging g		nd emerging issues in gender equality – Exploring possibilities for	iality - Glas	s ceilina	– role c ange an	of technolo d envision	gy in cont ing a gen	inuing or der-equal	CO5
future.  Lecture Peri	iode: 30	Tutorial Periods: -	Practica	al Perio	ds: -		Total Pe	riods: 30	)
dynamics 2. "The Sec gender in	s, and the cond Se nequality and Ge	ciety" by Raewyn Connell – This I le social construction of gender. x" by Simone de Beauvoir – A his t. ender in the Indian Society" by New and feminist movements in India.	torical and p	hilosop	hical exa	amination (	of women	's oppres	ssion ar
D C	200kg					/000			
Woman     A social	in early and Cul	Indian societies, New Delhi: Mand tural history, Volume1. Connecticu ltural history, Volume2. Connecticu ). Indian Feminism: Class, Gende	at. Oxioid. F	raeger.	Olta I tai	11411 (2000	,.	n Press. I	ftikhar,

1. Indoenamen

(2012).

Department of Civil Engineering

Dr.S. SUNDARARAMAN, M.Tech., Ph.2...
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2. A. 7.114

# Web References

- 1. https://www.unwomen.org
- 2. https://ncw.nic.in
- 3. https://en.unesco.org/themes/gender-equality
- 4. https://www.weforum.org/reports
- 5. https://wcd.nic.in

# COs/POs/PSOs Mapping

COs	BO1	PO1 PO2 PO3 PO4 PO5 PO5 PO2 PO2 PO4												Program Specific Outcomes (PSOs)		
_	PUT	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	1	6 -	ly = 1	-					-	3		1	1		1	
2	1	-		-	-		_			3		1				
3	1	_								3				-	1	
4	1						-	-	-	3		1	1	1-1	1	
-			015 10	7.		-	-		-	3		1	1	-	1	
5	1		-	-	-				_	3		1	1			

Correlation Level: 1 - Low, 2 - Medium, 3 - High

**Evaluation Methods** 

A	Continu			
Assessment	Attendance	MCQ Test	Presentation / Activity / Assignment	Total Marks
Marks	10	30	60	100

Dr.S. SUNDARARAMAN, M. Toch, Park.

Professor & Head
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

# Professional Elective Courses – II (Offered in Semester V)

Course Code	Course Title
U23CEE506	Advanced Design of RCC Structures
U23CEE507	Air and Noise Pollution
U23CEE508	Sustainable and Lean Construction
U23CEE509	Airport and Harbor Engineering
U23CEE510	Green Building Technology

(Maaaaana

Professor Final Engg
Department of Total Engg
Sri Manakula Vinayagar Engg. College
Madagedipet, Public Corry, India

period - No Established that mountained a state of

# Professional Beatlyn Courses & Colleged in Spirit der Vi

A vgalbadae Tiombhu8 nsan3 l	

Department of the Peace Page Department of the Page Service of the

		Engine	ering	Programme: B.Tech.								
Semester	V			Course	Catego	ory Code	: PE End	Semester I	Exam Ty	oe: <b>TE</b>		
Course Code	U230	EE506		Period	s/Week		Credit	Maxir	num Ma	rks		
	0230	-LU00		L	Τ	P	С	CAM	ESE	TM		
Course Name	Adva	nced De	sign of RCC Structures	3	0	0	3	25	75	100		
Prerequisite	DES	IGN OF	RC ELEMENTS									
	On co	mpletio	n of the course, the stude	nts will be	able to	)		4		apping		
	CO1		tand the behavior of Concre				arious condit	ions		st Leve		
Course	CO2	Unders	tand the limit state design of	columns	and bea	ms				<b>K</b> 3		
Outcome	CO3	Unders	tand the serviceability limit s	tate in sho	ort and I	ong tern	n conditions			<b>K</b> 3		
	CO4	Unders	tand the special RC structur	al elemen	ts				К3			
	CO5	Unders	tand the Limiting analysis of	beams ar	nd slabs				K3			
UNIT – I			STRUCTURAL DESIGN uni-axial compression, Ter				Periods:09		L			
Reinforcing stee UNIT – II	el. DESI	GN PHII	LOSOPHY				Pariode:00					
Behavior of sho	ort and I	ong colu	mns – Limit State Design of	Short and	Long (	Columns	with Biaxial	bending -	Interaction	on		
Unit – III	OI DCUI	ii colaiiii	n joints (problem for type1 or LITY LIMIT STATES	ıly).		T	Periods:09					
			ack widths in RC members.				remous.us	7		COS		
UNIT – IV		***************************************	VEMBERS				Periods:09	)		1003		
Behaviour and o	design (	of specia	l RC member - deep beams	, design o	f shear	walls, co	rbels and pi	le caps.		CO4		
UNIT – V			RC MEMBERS				Periods:09			············		
	f DO	omhore:	moment redistribution in co	ntinuous l	peams,	Yield Lir	ne theory of	slabs, Intr	oduction	to co		
_imit analysis o Strip theory for	the ana	lysis of s	slabs.							1		
Strip theory for _ecture Period	the ana	lysis of s	slabs. Tutorial Periods: -	Practic		ods: -	T	otal Perio	ds: 45			
Strip theory for Lecture Period  Text Books  1. Punmia, B.C Edition, 200  2. Varghese P.	the ana ls: 45 C and Ja 07 .C, "Adv	in, A.K,	Slabs.  Tutorial Periods: -  Limit state design of Reinfor  Reinforced Concrete Design"	Practice Conc.	rete, La	kshmi P India, 20	ublications (	P) Ltd., Ne		First		
Strip theory for Lecture Period Fext Books  1. Punmia, B.C Edition, 200 2. Varghese P. 3. Subramania	the ana Is: 45 C and Ja O7 C, "Adv	in, A.K,	labs.  Tutorial Periods: -  Limit state design of Reinfor	Practice Conc.	rete, La	kshmi P India, 20	ublications (	P) Ltd., Ne		First		
Strip theory for Lecture Period Fext Books  1. Punmia, B.C Edition, 200 2. Varghese P. 3. Subramania Reference Bo	the ana Is: 45 C and Ja D7 C, "Adv In.N., Do oks	in, A.K, vanced Resign of	Slabs.  Tutorial Periods: -  Limit state design of Reinfor Reinforced Concrete Design* Reinforced Concrete Structu	Practice ced Conc., Prentice tres, Oxfo	rete, La Hall of	kshmi P India, 20 ersity, Ne	ublications ( 011. ew Delhi,201	P) Ltd., Ne	ew Delhi,			
Etrip theory for Lecture Period Fext Books  1. Punmia, B.O. Edition, 200 2. Varghese P. 3. Subramania Reference Boo 1. Sinha, S.N, 2. Unnikrishna	the ana ls: 45 C and Ja O C, "Adv n.N., Do oks Reinford	lysis of s  ain, A.K,  vanced R  esign of  ced Cone  nd Devo	Slabs.  Tutorial Periods: -  Limit state design of Reinfor  Reinforced Concrete Design"	Practice ced Conc., Prentice ires, Oxfor	rete, La Hall of I	kshmi P India, 20 ersity, Ne	ublications ( 111. ew Delhi,201	P) Ltd., Ne	ew Delhi,	i, 2002		
Firing theory for Lecture Period  Fext Books  1. Punmia, B.C Edition, 200  2. Varghese P.  3. Subramania  Reference Boo  1. Sinha, S.N,  2. Unnikrishna Delhi, Third  3. Shah V.L. ar	the ana ls: 45  and Ja 7  C, "Adv n.N., Do oks Reinford Pillai an edition nd Karv	ain, A.K, vanced Resign of ced Cond d Devel 2011 e, S.R, A	Limit state design of Reinfor Reinforced Concrete Design" Reinforced Concrete Structu Crete Design, 2nd Edition, TalasMenon, Reinforced Concrete	Practice ced Conc. , Prentice ires, Oxforata Mc-Grete Designete Design	rete, La Hall of la rd University aw-Hill la gn, Tat	kshmi P India, 20 ersity, Ne Publishii a McGra ures Pul	ublications ( 011. ew Delhi,201 ng Company aw Hill Publ	P) Ltd., Ne 3. Limited, No ishing Colume, 2002.	New Delhi,	i, 2002		
Etrip theory for Lecture Period Fext Books  1. Punmia, B.C Edition, 200 2. Varghese P. 3. Subramania Reference Boot 1. Sinha, S.N, 2. Unnikrishna Delhi, Third 3. Shah V.L. ar 4. IS 456-2000	the ana ls: 45  C and Ja )7  C, "Adv n.N., Do oks  Reinford Pillai a edition nd Karv Plain a	ain, A.K, vanced Resign of ced Conducted Deviced, 2011 e, S.R, And Reinf	Limit state design of Reinfor Reinforced Concrete Design" Reinforced Concrete Structu crete Design, 2nd Edition, TalasMenon, Reinforced Concrete Advanced Reinforced Concretorced Concretor	Practice ced Conc. Prentice ires, Oxformata Mc-Grete Designate Create Designation, Bractice, B	rete, La Hall of law-Hill law-Hill law, Tat n, Struct	kshmi P India, 20 ersity, Ne Publishii a McGra ures Pul f Indian	ublications ( p11. ew Delhi,201 ng Company aw Hill Publ blications, Po	P) Ltd., Ne  3.  Limited, No ishing Colume, 2002. New Delhi	w Delhi,	i, 2002 td., Ne		
Strip theory for Lecture Period Fext Books  1. Punmia, B.C. Edition, 200 2. Varghese P. 3. Subramania Reference Boot 1. Sinha, S.N, 2. Unnikrishna Delhi, Third 3. Shah V.L. ar 4. IS 456-2000	the ana ls: 45  and Ja  or  c, "Adv  n.N., Do  oks  Reinford  Pillai a  edition  nd Karv  Plain a  7 (Part	lysis of s  ain, A.K,  ranced R  esign of  ced Cone nd Devol 2011 e, S.R, A  nd Reinf 1), Code	Limit state design of Reinform Reinforced Concrete Design Reinforced Concrete Structure Crete Design, 2nd Edition, TalasMenon, Reinforced Concrete	Practice ced Conc. Prentice ires, Oxformata Mc-Grete Designate Create Designation, Bractice, B	rete, La Hall of law-Hill law-Hill law, Tat n, Struct	kshmi P India, 20 ersity, Ne Publishii a McGra ures Pul f Indian	ublications ( p11. ew Delhi,201 ng Company aw Hill Publ blications, Po	P) Ltd., Ne  3.  Limited, No ishing Colume, 2002. New Delhi	w Delhi,	i, 2002 td., Ne		
Carrie theory for Lecture Period  Fext Books  1. Punmia, B.C. Edition, 200  2. Varghese P.  3. Subramania  Reference Boo  1. Sinha, S.N,  2. Unnikrishna Delhi, Third  3. Shah V.L. ar  4. IS 456-2000  5. IS 875- 198 of Indian State  Veb Reference	c and Jacon Cand Jacon Cand Jacon Cand Jacon Cand Jacon Cand Cand Cand Cand Cand Cand Cand Can	ain, A.K, vanced Resign of 2011 e, S.R, A nd Reinf 1), Code	Limit state design of Reinfor Reinforced Concrete Design Reinforced Concrete Structure Crete Design, 2nd Edition, TalasMenon, Reinforced Concrete Code of Practice for Design Load celhi.	Practice ced Conc. Prentice ires, Oxformata Mc-Grete Designate Create Designation, Bractice, B	rete, La Hall of law-Hill law-Hill law, Tat n, Struct	kshmi P India, 20 ersity, Ne Publishii a McGra ures Pul f Indian	ublications ( p11. ew Delhi,201 ng Company aw Hill Publ blications, Po	P) Ltd., Ne  3.  Limited, No ishing Colume, 2002. New Delhi	w Delhi,	i, 2002 td., Ne		
Strip theory for Lecture Period Fext Books  1. Punmia, B.C. Edition, 200 2. Varghese P. 3. Subramania Reference Book 1. Sinha, S.N, 2. Unnikrishna Delhi, Third 3. Shah V.L. ar 4. IS 456-2000 5. IS 875- 198 of Indian Str	the ana ls: 45  C and Ja )7  C, "Adv n.N., Do oks  Reinford Pillai a edition nd Karv Plain a 7 (Part andards es c.in/cou	ain, A.K, vanced Resign of ced Conducted Condu	Limit state design of Reinfor Reinforced Concrete Design" Reinforced Concrete Structure Crete Design, 2nd Edition, TalasMenon, Reinforced Concrete Code of Factive For Code Concrete Code of Factive For Code Concrete Code Code Code Code Code Code Code Cod	Practice ced Conc. Prentice ires, Oxformata Mc-Grete Designate Create Designation, Bractice, B	rete, La Hall of law-Hill law-Hill law, Tat n, Struct	kshmi P India, 20 ersity, Ne Publishii a McGra ures Pul f Indian	ublications ( p11. ew Delhi,201 ng Company aw Hill Publ blications, Po	P) Ltd., Ne  3.  Limited, No ishing Colume, 2002. New Delhi	w Delhi,	i, 2002 td., Ne		
Strip theory for Lecture Period Lecture Period Text Books  1. Punmia, B.C. Edition, 200 2. Varghese P. 3. Subramania Reference Boolom Sinha, S.N, 2. Unnikrishna Delhi, Third 3. Shah V.L. ar 4. IS 456-2000 5. IS 875- 198 of Indian Str. Web Reference I. https://nptel.ac	the ana ls: 45  and Ja  br  coks  Reinford  Pillai and edition  and Karv  Plain and Yarv  Plain and Yarv  and Ards  an	lysis of s  ain, A.K,  ranced R esign of  ced Cond d Devel 2011 e, S.R, A nd Reinf 1), Code 6, New D  urses/108 urses/108	Limit state design of Reinfor Reinforced Concrete Design Reinforced Concrete Structure Crete Design, 2nd Edition, TalasMenon, Reinforced Concrete Code of Practice for Design Load celhi.	Practice ced Conc. Prentice ires, Oxformata Mc-Grete Designate Create Designation, Bractice, B	rete, La Hall of law-Hill law-Hill law, Tat n, Struct	kshmi P India, 20 ersity, Ne Publishii a McGra ures Pul f Indian	ublications ( p11. ew Delhi,201 ng Company aw Hill Publ blications, Po	P) Ltd., Ne  3.  Limited, No ishing Colume, 2002. New Delhi	w Delhi,	i, 2002.		

or.S. SURBUSINARIOLE ETEL PER Professor & Head Department of Civil Energ Serio Lakela Vereyoper Engli, College Michaelanger, Fundamental

Department of Civil Engineering

Dr.S. SUNDARARAMAN, M.Tech., Pa.L.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

# COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PO	s)				Program Specific Outcomes (PSOs)		
	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	2		3	-	1	1	-	-			-	3	- 1	1
2	1	2	-	3	nie in	1	1		-	-	-	-	3	-	-
3	1	2	F. 1	3		1	1	-		4124	14.		3		
4	1	2	-	3	-	1	1	-			4-1	-	3	-	
5	1	2	41	3	<u> </u>		1			19 - T			3	· T	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

# **Evaluation Methods**

Assessment		Contin	End Semester	Total			
	CAT 1	CAT 2	Model Exam	Assignment*	Examination (ESE) Marks	Marks	
Marks	5	5	5	5	5	75	100

<sup>\*</sup>Application oriented / Problem solving / Design / Analytical in content beyond the syllabus.

1. Judamana\_

Professor & Head
Pepartment of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Department	Civil Engineering		nme: <b>B.T</b>		5= L-	1.0	Even T	MC: TE
emester	V		Categor		L	Semester		
\	LIGACIFERT	Perio	ds/Weel		Credit		mum Ma	
Course Code	U23CEE507	L	T	Р	С	CAM	ESE	TM
Course Name	Air And Noise Pollution	3	0	0	3	25	75	100
• •								
rerequisite	On completion of the course, the st	udents will be	able to					apping
	On completion of the course, the se	adonto imi						st Level)
Course	CO1 Identify the types and sources	of air pollutant	S				ľ	(2
Outcome	CO2 Predict the effects of air polluta	ants on human	health a	nd the e	environmen	t illining	ŀ	<b>&lt;2</b>
	CO3 Choose appropriate technologi						s	<b>&lt;2</b>
	CO4 Measure the pollutant concent							<2
	CO5 Suggest the control techniques						2000	<b>&lt;2</b>
JNIT – I	INTRODUCTION				Periods:9			
Vir pollutante	Sources - Classification of air pollu	utants – Partic	culates a	and gas	eous pollu	tants – Eff	ects of	air
allutante on h	numan health, vegetation and property	- Global issu	es and	air pollu	ition - Glol	oal warming	g – Ozo	i ie
aver depletion	Ambient air quality and emission star	ndards – Air po	llution in	dices –	Air act			CO1
ayor acpicuon		•						
UNIT – II	METEOROLOGY AND AIR POLLUT	ION			Periods:9		<b>.</b>	
Meteorology a	nd Air pollution – Atmospheric stability	– Inversions	<ul><li>Mixing</li></ul>	height	-Plume be	ehaviour -	Plume ri	se
estimation - E	ffluent dispersion theories –Air pollutant	s Modelling						CO2
				Ţ				
IINIT _ III	CONTROL OF PARTICULATE POLI	LUTANTS			Periods:9			
UNIT – III	CONTROL OF PARTICULATE POLI	LUTANTS	chambe	ers – Ce	ntrifugal-m	ultiple type	cyclones	s -   cos
UNIT – III		LUTANTS	chambe	ers – Ce spray so	ntrifugal-m	ultiple type	cyclones	s – co:
UNIT – III Control of Air p Collection effic	CONTROL OF PARTICULATE POLI pollutants: particulates – Filters – Gravit ciency - Electrostatic precipitators – Wet	LUTANTS	chambe	ers – Ce spray so	entrifugal-m crubbers - \	ultiple type /enturi scru	cyclones	s – cos
UNIT – III Control of Air p Collection effic	CONTROL OF PARTICULATE POLI pollutants: particulates – Filters – Gravit ciency - Electrostatic precipitators – Wet	LUTANTS tational settling	ntrifugal :	spray so	entrifugal-m crubbers - \ Periods:	ultiple type /enturi scru	idders	
UNIT – III Control of Air p Collection effic UNIT – IV	CONTROL OF PARTICULATE POLI pollutants: particulates – Filters – Gravit ciency - Electrostatic precipitators – Wet  GASEOUS POLLUTION CONTROL ution control – Absorption - Principles –	LUTANTS rational settling t collectors-Cer	ntrifugal :	spray so	entrifugal-m crubbers - \ Periods:9 sorption —	ultiple type /enturi scru ) Principal ac	idders	s –
UNIT – III Control of Air p Collection effic UNIT – IV	CONTROL OF PARTICULATE POLI pollutants: particulates – Filters – Gravit ciency - Electrostatic precipitators – Wet	LUTANTS rational settling t collectors-Cer	ntrifugal :	spray so	entrifugal-m crubbers - \ Periods:9 sorption —	ultiple type /enturi scru ) Principal ac	idders	
UNIT – III Control of Air p Collection effic UNIT – IV Gaseous pollu Equipment des	CONTROL OF PARTICULATE POLICULATION CONTROL  GASEOUS POLLUTION CONTROL  Ition control – Absorption - Principles – Scriptions – Condensation – Contact control – Contact	LUTANTS rational settling t collectors-Cer	ntrifugal :	spray so	entrifugal-m crubbers - \ Periods:9 sorption — I ment descri	ultiple type /enturi scru ) Principal ac ption	idders	s –
UNIT – III Control of Air p Collection effic UNIT – IV Gaseous pollu Equipment des	CONTROL OF PARTICULATE POLICULATION CONTROL  GASEOUS POLLUTION CONTROL  ation control – Absorption - Principles –  scriptions – Condensation – Contact control – Contact control – Control – Control – Contact	LUTANTS tational settling t collectors-Cell Description of	f equipm	ent, Ad Equipr	entrifugal-m crubbers - \ Periods:\$ sorption -   ment descri	ultiple type /enturi scru  Principal ac ption	dsorbent	s – CO4
UNIT – III Control of Air p Collection effic UNIT – IV Gaseous pollu Equipment des	CONTROL OF PARTICULATE POLICION DE CONTROL OF PARTICULATE POLICION DE CONTROL	LUTANTS tational settling t collectors-Cell Description of	f equipm neration	spray so	Periods:9 sorption — ment descri Periods:9	ultiple type /enturi scru  Principal ac ption  s of noise	dsorbent	S – CO4
UNIT – III Control of Air p Collection effic  UNIT – IV Gaseous pollu Equipment des  UNIT – V Sound and no	CONTROL OF PARTICULATE POLICULATION CONTROL  GASEOUS POLLUTION CONTROL  ation control – Absorption - Principles –  scriptions – Condensation – Contact control  NOISE POLLUTION CONTROL  oise - Source of noise pollution - En	tational settling toollectors-Cell Description of Indensers, Inciration Invironmental agetc., Sound me	f equipm neration nd induseasurem	ent, Ad Equipr strial no	Periods:9 sorption — lenent description — lenent de	ultiple type /enturi scru  Principal ac ption  s of noise	dsorbent	S – CO4
UNIT – III Control of Air p Collection effic  UNIT – IV Gaseous pollu Equipment des  UNIT – V Sound and no	CONTROL OF PARTICULATE POLICION DE CONTROL OF PARTICULATE POLICION DE CONTROL	tational settling toollectors-Cell Description of Indensers, Inciration Invironmental agetc., Sound me	f equipm neration nd induseasurem	ent, Ad Equipr strial no	Periods:9 sorption — lenent description — lenent de	ultiple type /enturi scru  Principal ac ption  s of noise	dsorbent	S – CO4
UNIT – III Control of Air p Collection effice UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and note Fundamentals prevention and	CONTROL OF PARTICULATE POLICULATION CONTROL GASEOUS POLLUTION CONTROL Scriptions – Condensation – Contact composes – Source of noise pollution – English of sound – generation, propagation, ed control of noise –Environmental and in	LUTANTS tational settling t collectors-Cell Description of ndensers, Incir nvironmental a etc., Sound me	f equipm neration nd induseasurem	spray so ent, Ad Equipr strial no ent, so control lo	Periods: Sorption — Periods: Periods: Periods: Periods: Dise -Effect und level n egislation	ultiple type /enturi scru  Principal ac ption  s of noise	dsorbents  pollutio easures	S – CO4
UNIT – III Control of Air p Collection effice UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and notes Fundamentals prevention and	CONTROL OF PARTICULATE POLICULATION CONTROL GASEOUS POLLUTION CONTROL Scriptions – Condensation – Contact composes – Source of noise pollution – English of sound – generation, propagation, ed control of noise –Environmental and in	LUTANTS tational settling t collectors-Cell Description of ndensers, Incir nvironmental a etc., Sound me	f equipm neration nd induseasurem	spray so ent, Ad Equipr strial no ent, so control lo	Periods: Sorption — Periods: Periods: Periods: Periods: Dise -Effect und level n egislation	ultiple type /enturi scru  Principal ac ption  s of noise neters – Ma	dsorbents  pollutio easures	S – CO4
UNIT – III Control of Air p Collection effic  UNIT – IV Gaseous pollu Equipment des  UNIT – V Sound and not prevention and prevention and lecture Perioderical prevents and lect	CONTROL OF PARTICULATE POLICULATION CONTROL OF PARTICULATE POLICULATION - Electrostatic precipitators – Wet GASEOUS POLLUTION CONTROL OF PRINCIPLES – Scriptions – Condensation – Contact company of the Pollution Control of Pollution - English of Sound – generation, propagation, of the Control of noise - Environmental and integrated of the Control of Tutorial Periods:	LUTANTS tational settling t collectors-Cer Description of ndensers, Incir nvironmental a etc., Sound me ndustrial noise	f equipm neration nd induseasurem	spray so ent, Ad Equipr strial no ent, so control lo	Periods: Sorption — Periods: Periods: Periods: Periods: Dise -Effect und level n egislation	ultiple type /enturi scru  Principal ac ption  s of noise neters – Ma	dsorbents  pollutio easures	S – CO4
UNIT – III Control of Air p Collection effice UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and note Fundamentals prevention and Lecture Period Text Books 1 Rao M N	CONTROL OF PARTICULATE POLICULATION CONTROL OF PARTICULATE POLICULATION CONTROL OF PARTICULATION CONTROL OF POLICULATION CONTROL OF POLICULATION CONTROL OF SOUND OF POLICULATION CONTROL OF SOUND OF POLICULATION OF POLICULATION OF POLICULATION OF POLICULATION OF POLICULATION OF POLICULATION OF PARTICULATE POLICULATION CONTROL OF POLICULATION OF POLICULATION OF PARTICULATE POLICULATION CONTROL OF POLICULATION OF PARTICULATE POLICULATION OF PARTICULATION OF PARTICULA	LUTANTS tational settling t collectors-Cell Description of Indensers, Incir Invironmental a etc., Sound mediustrial noise Practi 2018.	f equipm neration nd indus easurem - Noise c	spray something strial not control loods: -	Periods: Sorption — Periods: Periods: Periods: Periods: Periods: Dise -Effect und level n egislation	ultiple type /enturi scru  Principal ac ption  s of noise neters – Mo	dsorbents  pollutio easures	S - CO4
UNIT – III Control of Air p Collection effice UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and notes Fundamentals prevention and Lecture Period Text Books 1. Rao.M.N. 2. Rao.C.S.,	CONTROL OF PARTICULATE POLICULATION CONTROL DESCRIPTION DESCRIPTION DESCRIPTION CONTROL DESCRIPTION DE	LUTANTS tational settling t collectors-Cell Description of Indensers, Incir Invironmental a etc., Sound mediustrial noise Practi 2018.	f equipm neration nd indus easurem - Noise c	spray something strial not control loods: -	Periods: Sorption — Periods: Periods: Periods: Periods: Periods: Dise -Effect und level n egislation	ultiple type /enturi scru  Principal ac ption  s of noise neters – Mo	dsorbents  pollutio easures	S - CO4
UNIT – III Control of Air p Collection effice UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and note Fundamentals prevention and Lecture Period Text Books 1. Rao.M.N. 2. Rao.C.S., Reference Books	CONTROL OF PARTICULATE POLICION CONTROL pollutants: particulates — Filters — Gravitation y - Electrostatic precipitators — Wet GASEOUS POLLUTION CONTROL ation control — Absorption - Principles — scriptions — Condensation — Contact comples — Source of noise pollution - Engine of sound - generation, propagation, and control of noise -Environmental and in the code:  Tutorial Periods:  et al., Air Pollution, Tata Mc.Graw Hill, 2 Environmental Pollution Control Engine poks	LUTANTS rational settling t collectors-Cer Description of Indensers, Incir Invironmental a etc., Sound me Industrial noise Practi 2018. eering , New A	f equipm neration nd induseasurem - Noise c	ent, Ad Equipr strial no ent, son control lo	Periods: Sorption — Periods:	ultiple type /enturi scru  Principal ac ption  s of noise neters – Mo	dsorbents  pollutio easures	S - CO4
UNIT – III Control of Air p Collection effice UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and nor Fundamentals prevention and Lecture Period Text Books 1. Rao.M.N. 2. Rao.C.S., Reference Books 1. Noel de	CONTROL OF PARTICULATE POLICULATION CONTROL SCIENCY - Electrostatic precipitators – Wet GASEOUS POLLUTION CONTROL SCIENCE - Condensation – Principles – Scriptions – Condensation – Contact composer - Source of noise pollution - Engine of sound - generation, propagation, ed control of noise - Environmental and in the control of noise - Environmental and in Environmental Pollution Control Engine cooks  Nevers, Air Pollution Control Engineering	LUTANTS tational settling t collectors-Cell Description of Indensers, Incir Invironmental a etc., Sound me Industrial noise Practi 2018. Beering , New Al	f equipmeration of industrial period industrial period cal Period	ent, Ad Equipr strial no ent, son control lo	Periods: Sorption — Periods:	ultiple type /enturi scru  Principal ac ption  s of noise neters – Mo	dsorbents  pollutio easures	S - CO <sup>2</sup>
UNIT – III Control of Air p Collection effice UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and note Fundamentals prevention and Lecture Period Text Books 1. Rao.M.N. 2. Rao.C.S., Reference Books 1. Noel de 2. Stern, A	CONTROL OF PARTICULATE POLICION CONTROL DE C	LUTANTS tational settling t collectors-Cer Description of Indensers, Incir Invironmental a etc., Sound me Industrial noise Practi 2018. Beering , New Agering , New Agering , New Agering , New Agering , Mc.Graw H mic Press, 201	f equipmeration of industrial reasurements.	spray so ent, Ad Equiprostrial no ent, so control lo ods: -	Periods: Sorption — Periods:	ultiple type /enturi scru  Principal ac ption  s of noise neters – Mo	dsorbents  pollutio easures	S - CO4
UNIT – III Control of Air p Collection effice UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and nor Fundamentals prevention and Lecture Period Text Books 1. Rao.M.N. 2. Rao.C.S., Reference Books 1. Noel de 2. Stern, A 3. Cunniff,	CONTROL OF PARTICULATE POLICULATION CONTROL DISTRICT CONT	LUTANTS tational settling t collectors-Cer Description of Indensers, Incir Invironmental a etc., Sound me Industrial noise Practi 2018. Beering , New Agering , New Agering , New Agering , New Agering , Mc.Graw H mic Press, 201	f equipmeration of industrial reasurements.	spray so ent, Ad Equiprostrial no ent, so control lo ods: -	Periods: Sorption — Periods:	ultiple type /enturi scru  Principal ac ption  s of noise neters – Mo	dsorbents  pollutio easures	S – CO4
UNIT – III Control of Air p Collection effice UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and nor Fundamentals prevention and Lecture Period Text Books 1. Rao.M.N. 2. Rao.C.S., Reference Books 1. Noel de 2. Stern, A 3. Cunniff, Web Reference	CONTROL OF PARTICULATE POLICULATION CONTROL DISTRICTION CONTROL DI	LUTANTS tational settling t collectors-Cell Description of Indensers, Incir Invironmental a etc., Sound me Industrial noise Practi 2018. Beering , New All Ing, Mc.Graw H Indic Press, 201 Inn Wiley and S	f equipmeration of industrial reasurements.	spray so ent, Ad Equiprostrial no ent, so control lo ods: -	Periods: Sorption — Periods:	ultiple type /enturi scru  Principal ac ption  s of noise neters – Mo	dsorbents  pollutio easures	S – CO4
UNIT – III Control of Air p Collection efficience UNIT – IV Gaseous pollu Equipment des UNIT – V Sound and notes Fundamentals prevention and Lecture Period Text Books 1. Rao.M.N. 2. Rao.C.S., Reference Books 1. Noel de 2. Stern, A 3. Cunniff, Web Referen 1. https://or	CONTROL OF PARTICULATE POLICULATION CONTROL DISTRICT CONT	LUTANTS tational settling t collectors-Cer Description of Indensers, Incir Invironmental a etc., Sound me Industrial noise Practi 2018. Beering , New Agering , New Agerin	f equipmeration of industrial reasurements.	spray so ent, Ad Equiprostrial no ent, so control lo ods: -	Periods: Sorption — Periods:	ultiple type /enturi scru  Principal ac ption  s of noise neters – Mo	dsorbents  pollutio easures	S – CO4

Pholosopana

Department of Civil Engineering

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2. A.7.119

# COs/POs/PSOs Mapping

COs					Prog	ram C	Outcor	nes (P	Os)					ram Spo omes (F	
	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO2	3	2	2	2	3	3	3	3	2	3	2	2	3	2	2
CO3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

Correlation Level: 1- Low, 2 - Medium, 3 - High

# **Evaluation Methods**

		Contin	uous Asse	ssment Marks (C	AM)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup>Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph. L.

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. College

Madagadipet, Puducherry, India

Department of Civil Engineering

2. A. 7. 120

Department	Civil Engi	neering	Program	nme: <b>B.</b>	Tech.					
Semester	V		Course	Catego	ry Code	: PE *I	End	Semester	Exam Typ	e: <b>TE</b>
Course Code	HOSCEE	00	Perio	ods/Wee	ek	Cre	dit	Ma	ximum Ma	rks
Course Code	U23CEE5	J8	L	Т	Р	С		CAM	ESE	TN
Course Name	Sustainab	e and Lean Construction	3	0	0	3		25	75	100
Prerequisite	•			<u>. I</u>	L				<u> </u>	L
	On comple	etion of the course, the stude	ents will be	able to	)				BT Ma	pping
									(Highes	
Course	CO1 Des	cribe the various sustainable r	naterials us	ed in co	onstructi	on.			K	3
Outcome	CO2 Exp	lain the method of estimating t	he amount	of energ	gy requi	red for b	uildi	ng.	K	3
	CO3 Des	cribe the features of LEED, TE	RI and GR	IHA rati	ngs of b	uildings			K	3
		lain the core concepts of lean			_	-		their	K	
		ortance inachieving better prod								
	CO5 App	ly lean tools & techniques to a	chieve sust	ainabilit	y in con	struction	n pro	jects.	K	3
Unit – I	Introduct	ion & materials used in susta	ainable coi	nstructi	on			Period	s:09	
Introduction and	d definition of	of Sustainability - Carbon cyc	e - role of	constru	ction ma	aterial: d	conc	rete and	steel,	
etc CO2 conti	ribution from	cement and other constructio	n materials	- Recyc	cled and	manufa	actur	ed aggre	gate -	CO
Unit – II	*	Life cycle and sustainability.						Period	c:00	
		energy-calculation of embodie	d energy 1	or cons	truction	materia	ole -			CO2
										002
and primary crit	argy-Embou	ieu energy via-a-vis operationa	a energy in	Condition				voic citer	av use.	
	··•	ied energy via-a-vis operationa	ai energy in	COHOLLIC					,,	
Unit – III Control of energ	Green bu	ildings Iding – National Building Code	(NBC), EC	BC code	e, codes	s in neig	hbor	Period ingtropica	s:09	
Unit – III Control of energ - OTTV concept properties of co buildings - Zero	Green bugy use in buits and calculate and ca	ildings Iding – National Building Code lations – Features of LEED an laterials - influence of moisture Iding'	(NBC), EC	BC code	e, codes	s in neig	hbor	Period ingtropica ion and the ratings of	s:09 al countries nermal f green	
Unit – III Control of energ - OTTV concept properties of co buildings - Zero Unit – IV	Green bu gy use in bui ts and calcu nstruction m energy bui Core cond	ildings Iding – National Building Code lations – Features of LEED an laterials - influence of moisture Iding' cepts in lean	(NBC), EC d TERI – G content ar	BC code	e, codes ngs - Ro eling -Po	s in neig ble of ins erforma	hbor sulat nce	Period ingtropication and the ratings of Period	s:09 al countries nermal f green s:09	co:
Unit – III Control of energe - OTTV concept properties of co buildings - Zero Unit – IV Introduction to t	Green bu gy use in bui ts and calcu- nstruction mo energy bui Core cond the Course;	ildings Iding – National Building Code lations – Features of LEED and laterials - influence of moisture Iding' cepts in lean Lean Overview; Need for Proc	(NBC), EC d TERI – G content ar	BC code	e, codes ngs - Ro eling -Po	s in neig ble of ins erforma	hbor sulat nce	Period ingtropication and the ratings of Period	s:09 al countries nermal f green s:09	COS
Unit – III Control of energy - OTTV concept properties of co buildings - Zero Unit – IV Introduction to t Measurement S	Green bu gy use in bui ts and calcul nstruction mo energy bui Core cond the Course; system (PMS	ildings Iding – National Building Code lations – Features of LEED and laterials - influence of moisture Iding' cepts in lean Lean Overview; Need for Proc	(NBC), EC d TERI – G content ar	BC code	e, codes ngs - Ro eling -Po	s in neig ble of ins erforma	hbor sulat nce	Period ingtropication and the ratings of Period nt; Production	s:09 al countries nermal f green s:09 etivity	COS
Unit – III Control of energe of concept of c	Green bu gy use in bui ts and calcul nstruction modernergy bui Core conduction the Course; system (PMS) Lean constant	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Cepts in lean Lean Overview; Need for Process. Struction tools and technique Survey/ Foreman delay survey	(NBC), ECd TERI – Ge content are fuctivity Mees	BC code riha rati nd mode asurem	e, codes ngs - Ro eling -Po ent and	s in neigo ble of inserforma improve	hbor sulat nce emei	Period ingtropication and the ratings of Period Period Period Collaboration Collaborat	s:09 al countries nermal f green s:09 ctivity s:09 rative	CO2
Unit – III Control of energe - OTTV concept properties of co buildings - Zero Unit – IV Introduction to to Measurement S Unit – V Sampling/ Work Planning Syster	Green bu gy use in bui ts and calcu- nstruction m o energy bui Core cond the Course; System (PMS Lean const to Sampling; m (CPS)/ La	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Iding' Iding' Iding – Iding – Iding Iding – Iding – Iding – Iding Iding – Idi	(NBC), ECd TERI – Ge content are fuctivity Mees	BC code riha rati nd mode asurem	e, codes ngs - Ro eling -Po ent and	s in neigo ble of inserforma improve	hbor sulat nce emei	Period ingtropication and the ratings of Period Period Period Collaboration Collaborat	s:09 al countries nermal f green s:09 ctivity s:09 rative	CO2
Unit – III Control of energy OTTV concept oroperties of co- couldings - Zero Unit – IV Introduction to to Measurement S Unit – V Sampling/ Work Planning System Practicing Lear	Green bu gy use in bui ts and calcul nstruction more energy bui Core concide Course; system (PMS Lean constructions; system (CPS)/ Lan Tools in Pu	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Icepts in lean Lean Overview; Need for Process. Istruction tools and technique Survey/ Foreman delay survey Instant Planner System (LPS) – Beroject Site.	(NBC), EC d TERI – G content ar ductivity Me es ; Value Straig Room A	BC code riha rati nd mode easurem eam/ Pr pproach	e, codes ngs - Ro eling -Po ent and cocess N	s in neigo ble of inserforma improve	hbor sulat nce emei	Period ingtropication and the ratings of the Period Int; Product Period Int; Product Period Int; Collaboration, Collaboration, How to	s:09 al countries nermal f green s:09 ctivity s:09 rative Start	CO2
Unit – III Control of energy - OTTV concept properties of concept buildings - Zero Unit – IV Introduction to to Measurement S Unit – V Sampling/ Work Planning System Practicing Lear Lecture Period	Green bu gy use in bui ts and calcul nstruction more energy bui Core concide Course; system (PMS Lean constructions; system (CPS)/ Lan Tools in Pu	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Iding' Iding' Iding – Iding – Iding Iding – Iding – Iding – Iding Iding – Idi	(NBC), ECd TERI – Ge content are fuctivity Mees	BC code riha rati nd mode easurem eam/ Pr pproach	e, codes ngs - Ro eling -Po ent and cocess N	s in neigo ble of inserforma improve	hbor sulat nce emei	Period ingtropication and the ratings of Period Period Period Collaboration Collaborat	s:09 al countries nermal f green s:09 ctivity s:09 rative Start	CO4
Unit – III Control of energy OTTV concept Coroperties of co- couldings - Zero Unit – IV Introduction to to Measurement S Unit – V Sampling/ Work Planning System Practicing Lear Lecture Period Text Books	Green bury use in buits and calculate and calculate and calculate and calculate and consecutive consecutive (PMS)  Lean consecutive (CPS)/ Lan Tools in Pus. 145	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Idi	(NBC), ECd TERI – Geometric content are detected by the co	BC code riha rati nd mode asurem eam/ Pr pproach	e, codesings - Roeling - Poent and	in neigo ble of inserforma improve	hbor hbor nce emer	Period ingtropication and the ratings of Period Period Collabor, How to	s:09 al countries nermal f green s:09 ctivity s:09 rative Start	COS
Unit – III Control of energy OTTV concept properties of control of energy properties of control of energy Unit – IV Introduction to the energy Measurement Solunit – V Sampling/ Work Planning System Practicing Lear Lecture Period Text Books  1. Craig A Publish	Green bury use in buits and calculate and calculate and calculate and calculate and calculate and consecutive Core consecutive Course; System (PMS) Lean consecutive (CPS)/ Land Tools in Poss:45	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Idi	(NBC), EC d TERI – G content ar fuctivity Me es ; Value Straig Room A Practice	BC code riha rati nd mode easurem eam/ Pr pproach al Perio	e, codes ngs - Ro eling -Po ent and ocess N n, IT/BIN ods: -	s in neigoble of inserforma improve Mapping-Mand L	hbor hbor nce emer	Period ingtropication and the ratings of Period Period Collabor, How to	s:09 al countries nermal f green s:09 ctivity s:09 rative Start	CO3
Unit – III Control of energy OTTV concept oroperties of co- couldings - Zero Unit – IV Introduction to to Measurement S Unit – V Sampling/ Work Planning System Practicing Lear Lecture Period Text Books  1. Craig A Publisher 2. Steve G	Green bury use in builts and calculate and calculate and calculate and consecutive Core conditions (PMS) Lean consecutive (CPS)/ Lean consecutive (CPS	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Idi	(NBC), ECd TERI – Good TERI – Good TERI – Good TERI – Good Terion (National Practice of the Pr	BC code riha rati nd mode asurem eam/ Pr pproach al Perio s in the	e, codesings - Roeling - Poent and cocess Man, IT/BIN	in neigole of inserforma improve Mapping-Mand L	hbornsulation nce  - 5S ean  To	Period ingtropication and the ratings of Period Type Period Type Tools (Period Type Tools	s:09 al countries nermal f green s:09 ctivity s:09 rative Start ods:45	COS
Unit – III Control of energy OTTV concept Coroperties of co- couldings - Zero Unit – IV Introduction to to Measurement S Unit – V Sampling/ Work Planning System Practicing Lear Lecture Period Text Books  1. Craig A Publish 2. Steve G 3. Salem,	Green burgy use in builts and calcular instruction more energy build Core conclude Course; System (PMS) Lean constant (CPS)/ Lan Tools in Prose (CPS)/ Lan Tools in Prose (CPS)/ Lan Coodhew, Suboodhew, Suboodhe	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Idi	(NBC), ECd TERI – Gd TERI	BC code riha rati nd mode asurem eam/ Pr pproach al Perio s in the	e, codesings - Roeling - Poent and cocess Man, IT/BIN	in neigole of inserforma improve Mapping-Mand L	hbornsulation nce  - 5S ean  To	Period ingtropication and the ratings of Period Type Period Type Tools (Period Type Tools	s:09 al countries nermal f green s:09 ctivity s:09 rative Start ods:45	CO
Unit – III Control of energy OTTV concept properties of conceptions of conception	Green bury  gy use in builts and calcul nstruction more energy builts  Core conditions  the Course; system (PMS)  Lean consists  CPS)/ Land Tools in Pros:45  Langston ders, 2011. Goodhew, Suo., Solomore condition Techni	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Idi	(NBC), ECd TERI – Gd TERI	BC code riha rati nd mode asurem eam/ Pr pproach al Perio s in the	e, codesings - Roeling - Poent and cocess Man, IT/BIN	in neigole of inserforma improve Mapping-Mand L	hbornsulation nce  - 5S ean  To	Period ingtropication and the ratings of Period Type Period Type Tools (Period Type Tools	s:09 al countries nermal f green s:09 ctivity s:09 rative Start ods:45	CO
Unit – III Control of energy OTTV concepts Oroperties of concepts Or	Green burgy use in builts and calculate and calculate and calculate and calculate and calculate and consecutive Core consecutive Course; System (PMS) Lean consecutive CPS)/ Land Tools in Pres:45  Land Langston ders, 2011.  Goodhew, Sure Co., Solomoration Technicks	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Idi	(NBC), ECd TERI – General content are discontent ar	BC code riha rati nd mode easurem eam/ Pr pproach al Perio s in the ackwell, mplemen	e, codesings - Roeling - Poest Andrews IT/BIN  Built El  UK, 20*  ntation a	in neigible of inserforma improve lapping-land Landinand Asse	hbornce - 5S ean To	Period ingtropication and the ratings of Period Int; Produce Intervention Interve	s:09 al countries nermal f green s:09 ctivity s:09 rative Start ods:45	CO:
Jnit – III Control of energy OTTV concept Corperties of co- couldings - Zero Jnit – IV Introduction to to Measurement S Jnit – V Campling/ Work Planning System Practicing Lear Lecture Period Text Books  1. Craig A Publish 2. Steve G 3. Salem, Construe Reference Boo 1. Charles	Green bury use in builts and calculate and calculate and calculate and calculate and consecutive Core condition (PMS) Lean consecutive (PMS) Lean consecutive (CPS)/ Lan Tools in Puris:45  Langston ders, 2011. Goodhew, Sury Co., Solomoration Technols (Sury Co.) J Kibert, Sury Use in Distance (Sury Co.)	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Idi	(NBC), ECd TERI – Good Territory of the content are seen as a	BC code riha ration and mode asurem eam/ Pr pproach al Perion s in the ackwell, mplemen	e, codes ngs - Ro eling -Po ent and cocess M n, IT/BIM ods: - Built Eo UK, 20 ntation a	in neigole of inserforma improve Mapping-Mapping-Mand L	hbornsulation, 5 Sean To	Period ingtropication and the ratings of Period of Period (Period How to Period How to	s:09 al countries nermal f green s:09 ctivity s:09 rative Start ods:45 th Heinema	CO:
Unit – III Control of energy OTTV concept properties of co- puildings - Zero Unit – IV Introduction to to Measurement S Unit – V Sampling/ Work Planning System Practicing Lear Lecture Period Text Books  1. Craig A Publish 2. Steve G 3. Salem, Constru Reference Boo 1. Charles 2. Ballard,	Green burgy use in builts and calculate and calculate and calculate and calculate and conservation (Core conservation (PMS)  Lean conservation (CPS)/ Lan Tools in Proservation (CPS)/ Lan Coodhew, Subservation (CPS)/ CPS/ CPS/ CPS/ CPS/ CPS/ CPS/ CPS/ CPS	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Idi	(NBC), ECd TERI – Good Territory of the content are seen as a	BC code riha ration and mode asurem eam/ Pr pproach al Perion s in the ackwell, mplemen	e, codes ngs - Ro eling -Po ent and cocess M n, IT/BIM ods: - Built Eo UK, 20 ntation a	in neigole of inserforma improve Mapping-Mapping-Mand L	hbornsulation, 5 Sean To	Period ingtropication and the ratings of Period of Period (Period How to Period How to	s:09 al countries nermal f green s:09 ctivity s:09 rative Start ods:45 th Heinema	CO4
Unit – III Control of energy OTTV concept oroperties of co- ouildings - Zero Unit – IV Introduction to to Measurement S Unit – V Sampling/ Work Planning System Practicing Lear Practicing Lear Practicing Lear Construct Steve G Seference Boo Construct Reference Boo Sellard, Web Reference	Green bury use in builts and calculate and calculate and calculate and consecutive Core conditions (Core conditions). Lean consecutive Cores, 2011. Goodhew, St. O., Solomor action Technols (S., Tommeles.)	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Iding' Iding' Iding' Identity Identi	(NBC), ECd TERI – Good Territory of the content are seen as a	BC code riha ration and mode asurem eam/ Pr pproach al Perion s in the ackwell, mplemen	e, codes ngs - Ro eling -Po ent and cocess M n, IT/BIM ods: - Built Eo UK, 20 ntation a	in neigole of inserforma improve Mapping-Mapping-Mand L	hbornsulation, 5 Sean To	Period ingtropication and the ratings of Period of Period (Period How to Period How to	s:09 al countries nermal f green s:09 ctivity s:09 rative Start ods:45 th Heinema	CO4
Unit – III Control of energy OTTV concepts Properties of control buildings - Zero Unit – IV Introduction to the Measurement of Survey Measurement of Survey Planning System Practicing Lear Lecture Period Text Books  1. Craig And Publish 2. Steve of Steve of Survey 3. Salem, Construe Reference Book 1. Charles 2. Ballard, Web Reference 1. https://o	Green burgy use in builts and calcularity of the course; System (PMS) Lean construction (PMS) Lean construction (PMS) Lean construction (CPS)/ Lan Tools in Prosers, 2011. Goodhew, Succion Technology J Kibert, Succion Technology G, Tommelogy	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Idi	(NBC), ECd TERI – Gd TERI – Gd TERI – Gd TERI – Gd Territor tuctivity Mees  ; Value Straig Room A  Practice le Practice les, Wiley Blaid, M., Site in the propertion of the properties of the pr	BC code riha ration and mode asurem eam/ Pr pproach al Perion s in the ackwell, mplemen	e, codes ngs - Ro eling -Po ent and cocess M n, IT/BIM ods: - Built Eo UK, 20 ntation a	in neigole of inserforma improve Mapping-Mapping-Mand L	hbornsulation, Fig. 1. September 1. Septembe	Period ingtropication and the ratings of Period of Period (Period How to Period How to	s:09 al countries nermal f green s:09 ctivity s:09 rative Start ods:45 th Heinema	CO3
Unit – III Control of energy OTTV concept properties of co buildings - Zero Unit – IV Introduction to to Measurement S Unit – V Sampling/ Work Planning System Practicing Lear Lecture Period Text Books  1. Craig A Publish 2. Steve G 3. Salem, Construe Reference Boo 1. Charles 2. Ballard, Web Reference 1. https://o. 2. https://o.	Green bury use in builts and calculate and calculate and calculate and calculate and consecutive (PMS)  Lean consecutive (PMS)	ildings Iding – National Building Code Iations – Features of LEED and Iaterials - influence of moisture Iding' Iding Iding' Iding' Iding Iding' Iding Iding' Iding Iding' Iding Id	(NBC), ECd TERI – Gd Territory Medical Content are selected as a content are selec	BC code riha ration and mode asurem eam/ Pr pproach al Perion s in the ackwell, mplemen	e, codes ngs - Ro eling -Po ent and cocess M n, IT/BIM ods: - Built Eo UK, 20 ntation a	in neigole of inserforma improve Mapping-Mapping-Mand L	hbornsulation, Fig. 1. September 1. Septembe	Period ingtropication and the ratings of Period of Period (Period How to Period How to	s:09 al countries nermal f green s:09 ctivity s:09 rative Start ods:45 th Heinema	CO4

Dr.S. SUNDARARAMAN, M.Toch., Pa.2...
Professor & Head:
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet. Puducherry, India

# COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PO	s)	ar Jaan				ram Spe omes (P	
	P01	PO2	PO3	P04	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	-	1	1		2	3	1	1		2	1	3	2	3
2	3	1	3	2	1	2	2	-	1	1	1	2	3	2	3
3	2	2	3	1	1	1	1_	da II.	1,41		3	1	3	3	3
4	3	1	3	2	2	1	3	1	1	1	3	2	3	3	3
5	3	1	2	2	2	2	3	1		1	3	2	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Method**

	18.5	Cont	inuous As	sessment Marks (	CAM)	End Semester	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	1	0	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M. Tech., Ph.L.,
Professor & Head

Department of Civil Engg Sri Manakula Vinayağar Engg. College Madagadipet, Puducherry, India

2.4.7.122

Department	Civil Engineering	Progran	nme: B	Tech.					
Semester	V	Course	Catego	ory Cod	e: <b>PE</b>	End S	Semester E	xam Ty	pe: <b>TE</b>
Course Code	U23CEE509	Periods	/Week		Cr	edit	Maxim	um Ma	rks
Course Code	U23CEE309	L	T	P	С		CAM	ESE	TM
Course Name	Airport and Harbor Engineering	3	0	0	3		25	75	100
Prerequisite	Transportation Engineering						L		L
	On completion of the course, the stud	lents will be	able to	)					//apping
	CO1 Gain an insight on the planning a	nd site selec	tion of	Airport I	Planning	g and	design		K2
Course	CO2 Knowledge on Design of various								K2
Outcome	CO3 Analyze and design the element systems								K3
	CO4 Understand the various features protection works				eir con	struct	ion, coasta	l	K2
	CO5 Knowledge on various Environme	ental Regulat	ions ar	nd Acts					K2
UNIT – I	AIRPORT PLANNING				Perio				
Air transport ch Case Studies, p	aracteristics - airport classification – ICA arking and Circulation Area	ιΟ - airport μ	olannin	g: Site	selectio	n typi	cal Airport	Layout	s, C01
UNIT – II	AIRPORT COMPONENTS				Perio				
Geometric desi	ation, Planning of Airfield Components - gn of runway and taxiways-Runway pa	vement Des	axiway ign- D	, Apron	, Hanga e betwe	ar- Pa en H	issenger Ti lighway an	erminals d airpo	s- rt CO2
oavements- Intr U <b>NIT – III</b>	oduction to various design methods- Airpo	ort drainage.			T = -				
					Perio				
Elements of Ru	n: Orientation, Wind Rose Diagram, Pronumay Design – Airport Zones – Passenge ol Tower- Instrumental Landing.	er Facilities a	and Sei	vices –	Runwa	y and	Taxiway N	/larkings	S- CO3
	SEAPORTS COMPONENTS AND CON			t: _ D	Perio				
and Design of F	sic Terms: Harbor, Port, Satellite Port, D Harbors: Harbour Layout and Terminal Fa Spring Fenders, Dolphins Floating Landin	cilities - Coa	astal St	tructure	s: Piers	Brea	k waters. \	Wharve:	g s, <b>CO4</b>
JNIT – V	SEAPORT REGULATIONS AND EIA				Perio			<b>L.</b>	I
Wave action on	Coastal Structures and Shore Protection	n and Reclar	mation	– Coas	tal Reg	ulatio	n Zone, 20	11-EIA	-
	act analysis and its process s: 45	D (*							COS
Text Books	s: 45 Tutorial Periods: -	Practica	ai Perio	oas:	-	119	otal Period	s: 45	
	o S.K. Aroro M.C. and Join S.C. Aiment Di								
	a.S.K. Arora.M.G and Jain.S.S, Airport Pla								
De Nei	Honjeff and Francis X.Mckelvey, "Plannir ufille and Amedeo Odoni, "Airport System	s Planning a	nd Des	ign", Mo	Graw F	Hill, No	ew York,20	03	
2010	nanian K.P., Highways, Railways, Airport	and Harbour	Engin	eering,S	Scitech I	oublic	ations (Ind	a), Che	nnai,
Reference Boo									
Tunnel	ramaiah. C., Transportation Engineering- s.,Universities Press (India) Private Limite	ed, Hyderaba	d, 201	5.		Tolk.			
	ey J S, Railway Track Engineering, McGra							13.	
	ndra, A Course in Docks and Harbour Eng								
	Road Congress (IRC), Guidelines for the								
5. Indian	Road Congress (IRC), Guidelines for the	Design of Pla	oin lair	tod Dia	: d D	monte	. £ I I: - I-		-ı · ı

Dr.S. SUNDARARAMAN, M.Tech., Pa.:..

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. Cellege
Madagadipet, Puducherry, India

# Web References

- 1. https://nptel.ac.in/courses/105/101/105101083/
- 2. https://nptel.ac.in/courses/105105176/
- 3. https://nptel.ac.in/courses/105/105/105105039/
- 4. https://nptel.ac.in/courses/105107123/
- 5. https://nptel.ac.in/courses/114106025/

# COs/POs/PSOs Mapping

COs						ram O	utcom	es (PO	s)				Prog	ram Spe omes (P	ecific
	PO1		PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12			
1	3	3	3	2	-	1 1		34.8		-			2	2	1
2	3	3	3	2		-	<b>10</b>			_			1	1	1
3	3	3	3	2	1.2	_							1	1	
1	2		2	1	2					-111-1			3	3	2
4					3		-	-			0.	-	2	2	1
5	1	-	-	2	3	<u> </u>	-	11-7	10-1-1	115-21		= -	3	3	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

# **Evaluation Methods**

	libra de	Contin	uous Asse	essment Marks (C	AM)	End Semester	10 00.
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus.

Dr.S. SUNDARARAMAN, M.Tech., Ph.: Professor & Head Department of Civil Engg

Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2. 4.7.124

Department	Civil Engineering		mme :B					TF
Semester	V			ry Code		Semester		***************************************
		Peri	ods/We	ek	Credit	Max	mum Mar	KS
Course Code	U23CEE510	L	Т	Р	С	CAM	ESE	ТМ
Course Name	Green Building Technology	3	0	0	3	25	75	100
Prerequisite							BT Ma	nnina
	On completion of the course, the s	tudents will b	e able t	0			(Highes	• • •
					dian rating s	vetems	K	
Course	CO1 Understand green building princ	cipies, nistory,	impacis	, and m	ulail rating s	y 3 (C) 110.		
Outcome	CO2 Identify energy sources, their methods.							
	CO3 Recognize energy-efficient ma							
	CO4 Apply green building design gu	idelines and co	onduct c	ost and	life-cycle ar	alysis.		3
	CO5 Familiarize with building codes	, legislation, ar	nd the IC	BC cert	ification pro	cess.	K	2
Unit – I	Concept of Green buildings				Periods:0	9		
Dofinition of G	reen Buildings - Typical features of gr	reen buildings	- Neces	sity, init	tiatives of g	reen buildii	ngs in	CO1
adia Croon	building Assessment - Green Building	Rating System	ns - Ene	ergy effic	cient criteria	- FUALOUI	lentai	
onefite econ	omic benefits, health and social benefit	s - Major ener	gy efficie	ency are	as for buildi	ng - Conun	bution	
of buildings to	wards Global Warming - Life cycle cost	of buildings -	Codes a	nd Certi	fication Pro	grams		
1 . 14 11	Sources of energy				Perioas:	9		
7	ad Non renewable sources of energy	- Coal, Petro	leum, N	luclear,	Wind, Sola	r, Hydro, (	Geotherm	al CO2
CHEWADIC A	id ittelliteries						-l	
auraga: notal	ntial of these sources hazards pollut	ion - Global s	cenario	with ret	erence to c	emand and	a Supply	111
-dia Clabal	ntial of these sources, hazards, pollut	ion - Global s arbon emissio	cenario n: Fore	with ret casting -	erence to of - Control of	carbon em	ission - A	\ir
India Clobal	ntial of these sources, hazards, pollut	ion - Global s arbon emissio	cenario n: Fore	with ret casting -	erence to of - Control of	carbon em	ission - A	\ir
India - Global quality and its	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. C monitoring carbon foot print - Environn	ion - Global s arbon emissio	cenario n: Fore	with ret casting -	erence to of - Control of	carbon em	ission - A	vir
India - Global quality and its Green Remod	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. C monitoring carbon foot print - Environn els.	ion - Global s arbon emissionental issues -	cenario n: Foreo Minimiz	with ret casting -	- Control of oon emissior	carbon em	ission - A	vir
India - Global quality and its Green Remod	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. C monitoring carbon foot print - Environmels.  Green building materials, planning	ion - Global s arbon emissionental issues -	cenario n: Fore Minimiz	with ret	- Control of on emission	carbon em	ission - A etrofits ar	vir
India - Global quality and its Green Remod Unit - III	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. C monitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Ma	ion - Global starbon emission nental issues - nental specifi neg and specifi nerials - Deple	cenario n: Foree Minimiz  cation eting nat	with ret casting - ing carb tural res	Periods:0	carbon em  - Energy r  - Suilding ma	ission - A etrofits ar terials -	vir
India - Global quality and its Green Remod <b>Unit – III</b> Green Buildin	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. C monitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Managed Recyclable resources - Energy efficiency	ion - Global starbon emission nental issues - nental issues - nental issues - nental issues - Deple cient materials	cenario in: Forei Minimiz  cation eting nat	with rer casting - ing carb tural res n cemei	Periods:0  Periods:0  Fources of bont - Biodegr	carbon em  1 - Energy r  1 - Energy r  1 - Energy r  1 - Energy r  2 - Energy r  2 - Energy r  3 - Energy r  4 - Energy r	ission - A etrofits ar terials - terials -	Air nd
India - Global quality and its Green Remod Unit – III Green Buildin Renewable an	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. C monitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efficies - Manufactured Materials - Volatile Communications - Volatile Communica	ion - Global starbon emission nental issues - ag and specifi tterials - Deplecient materials Organic Compo	cation eting nate ounds (V	with rer casting - ing carb tural res n cemen	Periods:0 cources of both - Biodegri	carbon em  1 - Energy r  109  101  101  101  101  101  101  10	terials - terials - terials -	Air nd
India - Global quality and its Green Remod Unit - III Green Buildin Renewable at Smart materia	efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efforts - Manufactured Materials - Volatile Compared materials - Renewable and Indianations.	ion - Global starbon emission mental issues - mag and specificaterials - Deplace cient materials Organic Compositionnous Buildi	cenario n: Forec Minimiz  cation eting nate s - Gree bunds (V	with rer casting carb ing carb tural res n ceme (OC's) -	Periods:  Gources of bont - Biodegr Natural Nor	carbon em  1 - Energy r  109  Initially materials and able materials a	terials - terials - terials - terials - terials - terials -	Air and
India - Global quality and its Green Remod Unit - III Green Buildin Renewable ar Smart material Materials - Re	efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efficiency Materials - Volatile Cocycled materials - Renewable and Indiana Published Recyclifican Published Recyclifican Published Recycled Specifican Published Recycled	ion - Global starbon emission mental issues - ag and specifi tterials - Deplacient materials Organic Compositions Buildi ations: Enviro	cenario n: Forec Minimiz  cation eting nate ounds (Ving Mate	tural resolverials - Erials - Eriendly	Periods:0 cources of bont - Biodegr Natural Noringineering and cost	carbon em  - Energy r	terials -	Air and
India - Global quality and its Green Remod Unit - III Green Buildin Renewable ar Smart material Materials - Re	efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efforts - Manufactured Materials - Volatile Compared materials - Renewable and Indianations.	ion - Global starbon emission mental issues - ag and specifi tterials - Deplacient materials Organic Compositions Buildi ations: Enviro	cenario n: Forec Minimiz  cation eting nate ounds (Ving Mate	tural resolverials - Erials - Eriendly	Periods:0 cources of bont - Biodegr Natural Noringineering and cost	carbon em  - Energy r	terials -	Air nd
India - Global quality and its Green Remod Unit – III Green Buildin Renewable ai Smart materia Materials - Re materials. Gr Technologies	efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efficiency Materials - Volatile Cocycled materials - Renewable and Indiana Published Recyclifican Published Recyclifican Published Recycled Specifican Published Recycled	ion - Global starbon emission mental issues - ag and specifi tterials - Deplacient materials Organic Compositions Buildi ations: Enviro	cenario n: Forec Minimiz  cation eting nate ounds (Ving Mate	tural resolverials - Erials - Eriendly	Periods:0 ources of bources of bo	carbon em  1 - Energy r  109  uilding ma  adable ma  1-Petroleum  evaluation  effective  ation Meas	terials -	Air nd
India - Global quality and its Green Remod Unit - III Green Buildin Renewable at Smart material Adterials - Rematerials Grechnologies Buildings.	efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efficiency endergo and Materials - Volatile Cocycled materials - Renewable and Independent of Manufactured Materials - Volatile Cocycled materials - Renewable and Independent of Manufactured Life cycle design of Manufactured Life	ion - Global starbon emission ental issues -  ag and specificaterials - Deplecient materials  Organic Composition of Buildingenous Buildingenous Environterials and St	cenario n: Forec Minimiz  cation eting nate ounds (V ng Mate onment ructures	tural resolver casting carbon camel (OC's) - erials - Efriendly - Ener	Periods:0  Periods:0  Outcome of both and a sources of both and a source of both a source of both and a source of both a source of both and a source of both and a source of	carbon em  1 - Energy r  109  uilding ma  adable ma  1 - Petroleum  evaluation  effective  ation Meas	terials -	COS
India - Global quality and its Green Remod Unit – III Green Buildin Renewable as Smart material - Rematerials. Gratechnologies Buildings.  Unit – IV	efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efforts - Manufactured Materials - Volatile Cocycled materials - Renewable and Indiana Building Planning and Specific - Integrated Life cycle design of Manufactured Materials - Impact of building on environments.	ion - Global starbon emission ental issues -  ag and specificaterials - Depletient materials organic Compositions: Environment - Life of the compositions and Starbons - Life of the compositions - Life of the compositions - Life of the compositions - Life of the composition - Li	cation eting nate ounds (Ving Mate oundertures	tural reservable.  Control of the co	Periods:  Periods:  Natural Nor  ingineering of and cost gy Conserv  Periods:  Periods:  Periods:	carbon em  - Energy r  - Energ	terials - terials - terials - n Based of these Building sures in	CO:
ndia - Global quality and its Green Remod Unit – III Green Buildin Renewable au Smart materials - Rematerials. Gratenhologies Buildings.  Unit – IV Sustainable standard its	efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efficies - Manufactured Materials - Volatile Cocycled materials - Renewable and Independent Building Planning and Specificals - Integrated Life cycle design of Manufactured Materials - Planning and Specificals - Integrated Life cycle design of Manufactured Materials - Planning and Specificals - Impact of building on environs building design - Planning on Rioclima	ion - Global starbon emission ental issues -  ag and specificaterials - Depletient materials  Organic Compositions: Environment - Life of the control of the	cation eting nate ounds (V ng Mate ounds tructures expelse as	tural researchites En cement (OC's) - Erials - Eneres Ener	Periods: and cost gy Conserv  Periods: and cost gy Conserv  Periods: are - Princip cure - Considered to the cost cure - Consid	carbon em  1 - Energy r  109  uilding ma  adable ma  1-Petroleun  evaluation  effective  ation Meas  109  lles of sus  derations o	terials - terials - terials - terials - Based of these Building sures in tainable f energy	COS
ndia - Global quality and its Green Remod Unit - III Green Buildin Renewable au Smart materia Materials - Re materials. Gr Technologies Buildings. Unit - IV Sustainable s	efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efficies - Manufactured Materials - Volatile Cocycled materials - Renewable and Independent Building Planning and Specificals - Integrated Life cycle design of Manufactured Materials - Planning and Specificals - Integrated Life cycle design of Manufactured Materials - Planning and Specificals - Impact of building on environs building design - Planning on Rioclima	ion - Global starbon emission ental issues -  ag and specificaterials - Depletient materials  Organic Compositions: Environment - Life of the control of the	cation eting nate ounds (V ng Mate ounds tructures expelse as	tural researchites En cement (OC's) - Erials - Eneres Ener	Periods: and cost gy Conserv  Periods: and cost gy Conserv  Periods: are - Princip cure - Considered to the cost cure - Consid	carbon em  1 - Energy r  109  uilding ma  adable ma  1-Petroleun  evaluation  effective  ation Meas  109  lles of sus  derations o	terials - terials - terials - terials - Based of these Building sures in tainable f energy	COS
ndia - Global quality and its Green Remod Unit – III Green Buildin Renewable and Smart materials - Rematerials - Gratenhologies Buildings.  Unit – IV Sustainable sedevelopment consumption.	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efficiency endergo and Materials - Volatile Cocycled materials - Renewable and Independent Building Planning and Specific - Integrated Life cycle design of Mandal Design of Green buildings  Sites - Impact of building on environ in building design - Design on Bioclima water use and system reliability - In	ion - Global starbon emission ental issues -  ag and specificaterials - Deplecient materials  Organic Compositions: Environment - Life of the color	cation eting nate ounds (Ving Mate ounds (ving Mate))))))	tural researchites En cement (OC's) - Erials - Eneres Enseres	Periods: and cost gy Conserv  Periods: and cost gy Conserv  Periods: are - Princip cure - Considered to the cost cure - Consid	carbon em  1 - Energy r  109  uilding ma  adable ma  1-Petroleun  evaluation  effective  ation Meas  109  lles of sus  derations o	terials - terials - terials - terials - Based of these Building sures in tainable f energy	CO:
ndia - Global quality and its Green Remod Unit – III Green Buildin Renewable at Smart materials - Rematerials - Gratenologies Buildings.  Unit – IV Sustainable sidevelopment consumption, building designable is general to the consumption, building designatics.	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efficiency endergo and Materials - Volatile Cocycled materials - Renewable and Independent Building Planning and Specifical - Integrated Life cycle design of Mandal Design of Green buildings sites - Impact of building on environg in building design - Design on Bioclimate water use and system reliability - In part - Advanced Green building technology	ion - Global starbon emission ental issues -  ag and specificaterials - Deplecient materials  Organic Compositions: Environment - Life of the composition of the comp	cation eting nate ounds (Ving Mate ounds (ving Mate))))))	tural researchites En cement (OC's) - Erials - Eneres Enseres	Periods:  Company Conservation  Peri	carbon em  - Energy r  - Energ	terials - terials - terials - terials - Based of these Building sures in tainable f energy	co:
India - Global quality and its Green Remod Unit - III Green Buildin Renewable at Smart material Materials - Rematerials. Gr Technologies Buildings.  Unit - IV Sustainable s development consumption, building designant is seen to see the consumption of the consu	efforts to reduce carbon emissions. Construction of Green building states of the service of the building of the service of the building of the service of th	ion - Global starbon emission ental issues -  ag and specificaterials - Depletient materials organic Compositions: Environment - Life of atic and solar properties and innovations and innovat	cenario in: Forec Minimiz  cation eting nate ounds (Ving Mate onment ructures cassive a by, noise ations.	tural resonant cement (OC's) - erials - Eneresessme architecte level,	Periods:	carbon em  - Energy r  - Energ	terials - terials - terials - n Based of these Building sures in tainable f energy iency in	CO
India - Global quality and its Green Remod Unit – III Green Buildin Renewable and Smart materials - Rematerials - Gratenologies Buildings.  Unit – IV Sustainable so development consumption, building desig Unit – V	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efforts - Manufactured Materials - Volatile Cocycled materials - Renewable and Independent Building Planning and Specific - Integrated Life cycle design of Manufactured Materials - Buildings on environmental Design of Green buildings Sites - Impact of building on environmental Building design - Design on Bioclimate water use and system reliability - In an - Advanced Green building technology of the construction - Practices for thermal states and system reliability - In the construction - Practices for thermal states are successful to the construction - Practices for thermal states are successful to the construction - Practices for thermal states are successful to the construction - Practices for thermal states are successful to the construction - Practices for thermal states are successful to the construction - Practices for thermal states are successful to the construction - Practices for thermal states are successful to the construction - Practices for the construction - Practice	ion - Global starbon emission ental issues -  ag and specificaterials - Depletient materials  Organic Compositions: Environment - Life of the starbon and solar properties and innoventies and	cenario in: Forece Minimiz  cation eting nate is - Gree bunds (Ving Mate bundent ructures  cycle as bassive a by, noise ations.	tural researchitects sessme architects level,	Periods:  Periods:  Natural Nor  Ingineering and cost  gy Conserv  Periods:  Periods:  Periods:  Periods:  Periods:  Periods:  Periods:  Periods:  Periods:	carbon em  1 - Energy r  1 - E	terials - terials - terials - n Based of these Building sures in tainable f energy iency in	CO
India - Global quality and its Green Remod Unit – III Green Buildin Renewable as Smart materials - Rematerials - Graterials - Graterials - IV Sustainable services development consumption, building designation of the services of the servic	efforts to reduce carbon emissions. Comonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efforts - Manufactured Materials - Volatile Cocycled materials - Renewable and Indeen Building Planning and Specific - Integrated Life cycle design of Manufactured Materials - Manufactured Materials - Manufactured Materials - Volatile Cocycled materials - Renewable and Indeen Building Planning and Specific - Integrated Life cycle design of Manufactured Life cycle design of Manufacture of building on environg in building design - Design on Bioclima water use and system reliability - In a Advanced Green building technology Construction - Practices for thermal building retting - Maintenance of green buildings retting - Maintenance of green building retting - Maintenance of green building retting - Maintenance of green building contains and provided in the maintenance of green buildings and provided in the maintenance of green building the maintenance of green building and provided in the maintenance of green building	ion - Global starbon emission ental issues -  ag and specificaterials - Deplecient materials  Organic Composition of Environment - Life of the ental starbon	cenario in: Forece Minimiz  cation eting nate is - Gree ounds (Ving Mate onment ructures expele as expele	tural researchitecte level,	Periods:  Periods:  Natural Nor  Ingineering and cost  gy Conserv  Periods:  The Princip cure - Considered and cost  The Princip cure - Considered and cost  The Princip cure - Considered and cost  Periods:  Periods:  Periods:  Periods:  Periods:	carbon em  - Energy r  - Energ	terials - terials - terials - n Based of these Building sures in tainable f energy iency in	CO
India - Global quality and its Green Remod Unit - III Green Buildin Renewable as Smart material - Rematerials - Rematerials - Gratenologies Buildings.  Unit - IV Sustainable stavelopment consumption, building desig Unit - V Energy efficies ECB codes	ntial of these sources, hazards, pollut efforts to reduce carbon emissions. Commonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Manad Recyclable resources - Energy efforts - Manufactured Materials - Volatile Cocycled materials - Renewable and Independent Building Planning and Specific - Integrated Life cycle design of Management meters and system reliability - In the Advanced Green building technology of the Construction of Green buildings and construction - Practices for thermal building rating - Maintenance of green Project Management meters.	ion - Global starbon emission ental issues -  ag and specificaterials - Depletient materials organic Compositions: Environment - Life of the control of the	cenario in: Forei Minimiz  cation eting nate is - Gree bunds (Ving Mate bundent ructures  cycle as bassive a by, noise ations.  natural - Cost st Pract	tural researchitecte level,  lighting and Perices - Comments of the comments o	Periods:  Periods:  On emission  Periods:  Ources of bout - Biodegr  Natural Nor  Ingineering of and cost  gy Conserv  Periods:  Int - Princip  Ture - Consider  Comfort and  Periods:  - Eco- frience  Periods:  Cost/benefit	carbon em  - Energy r  - Energ	terials - terials - terials - n Based of these Building sures in tainable f energy iency in	Air nd
India - Global quality and its Green Remod Unit – III Green Buildin Renewable as Smart material - Rematerials - Rematerials - Gratenologies Buildings.  Unit – IV Sustainable sidevelopment consumption, building desig Unit – V Energy efficies ECB codes	efforts to reduce carbon emissions. Comonitoring carbon foot print - Environmels.  Green building materials, planning Materials: Sustainably managed Mand Recyclable resources - Energy efforts - Manufactured Materials - Volatile Cocycled materials - Renewable and Indeen Building Planning and Specific - Integrated Life cycle design of Manufactured Materials - Manufactured Materials - Manufactured Materials - Volatile Cocycled materials - Renewable and Indeen Building Planning and Specific - Integrated Life cycle design of Manufactured Life cycle design of Manufacture of building on environg in building design - Design on Bioclima water use and system reliability - In a Advanced Green building technology Construction - Practices for thermal building retting - Maintenance of green buildings retting - Maintenance of green building retting - Maintenance of green building retting - Maintenance of green building contains and provided in the maintenance of green buildings and provided in the maintenance of green building the maintenance of green building and provided in the maintenance of green building	ion - Global starbon emission ental issues -  ag and specificaterials - Depletient materials  Organic Composition of Environment - Life of the entire and solar properties and innoverselligies and innoverselligies and innoverselligies and Bese studies of respective of the entire and solar properties and innoverselligies and innoverselligies and Bese studies of respective of the entire and Bese studies of respective of the entire and solar properties and innoverselligies and innoverselligies and innoverselligies and Bese studies of respective of the entire and solar properties and innoverselligies and innoverselligies and innoverselligies and innoverselligies and Bese studies of respective of the entire and the entire	cenario in: Forei Minimiz  cation eting nate is - Gree bunds (Ving Mate bundent ructures  cycle as bassive a by, noise ations.  natural - Cost st Pract	tural researchitecte level,  lighting and Perices - (Idings (Indians))	Periods:  Periods:  On emission  Periods:  Ources of bout - Biodegr  Natural Nor  Ingineering of and cost  gy Conserv  Periods:  Int - Princip  Ture - Consider  Comfort and  Periods:  - Eco- frience  Periods:  Cost/benefit	carbon em  - Energy r  - Energ	terials - terials - terials - n Based of these Building sures in tainable f energy iency in roofing - ons and of green	cc

Department of Civil Engineering

Dr.S. SUNDARARAMAN, M.Tech., Ph.a.,
Prefessor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

# Text Books

- 1. Kibert, C.J, "Sustainable Construction: Green Building Design and Delivery". John Willey and Sons, 2016.
- Edward G Pita, An Energy Approach Air -conditioning Principles and Systems", Pearson Education, 2018.
- K.S Jagadish, B. U. Venkataramareddy and K.S. Nanjundarao, "Alternative Building Materials and Technoogies K, New Age International, 2018.

### Reference Books

- Osman Attmann, "Green Architecture Advanced Technologies and Materials". McGraw Hill, 2018.
- Jerry Yudelson "Green building Through Integrated Design" McGraw Hill, 2018.
- 3. Lever More G J,"Building Energy Management System", E and FN Spon , London, 2013.

### Web References

- 1. https://nptel.ac.in/courses/105102195/
- https://www.archdaily.com/tag/case-study-houses
- https://www.archdaily.com/category/office-buildings

### COs/POs/PSOs Mapping

Cos					Prog	ram O	utcom	es (PO	s)			a pratiti		ram Spe omes (P	
003	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	3	3	3	2	3	2	3	2	3	3	3	3
2	3	3	3	3	3	3	2	3	2	3	2	3	3	- 3	3
3	3	3	3	3	3	3	2	3	2	3	2	3	3	3 .	3
4	3	3	3	3	3	3	2	3	2	3	2	3	3	3	3
5	3	3	3	3	3	3	2	3	2	3	2	3	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

# **Evaluation Method**

	in one	Cont	inuous As	sessment Marks	(CAM)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	1	0	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Pn.:..

Professor & Head Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

# Professional Elective Courses – III (Offered in Semester VI)

Course Title
Advanced Structural Analysis
Pollution control and Monitoring
Building Codes and Requirement
Traffic engineering and Management
Urban Planning and Development

f. Indoorana\_

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Department of Civil Engineering

2. A.7.127

1. Indacciona

Dr.S. SUNDARARAMAN, M.Tech., Pa....
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Department	Civil	Engineering	Programm	e: <b>B.Te</b>	ch.							
Semester	VI		Course Ca	ategory (	Code: Pl	E *End	Semeste	er Exam Ty	pe: TE			
			Periods / W	/eek	- 12 3	Credit	Ma	ximum Ma	rks			
Course Code	U230	CEE611	L	Т	Р	С	CAM	ESE	TM			
Course Name		anced Structural Analysis	3	0	0	3	25	75	100			
Prerequisite	Stru	ctural Analysis										
Course		ompletion of the course, the						(Hig	apping hest vel)			
Outcome	CO1	Understand the principles of bridges.	cable structures and	d the me	echanics	of suspe	ension	r	(3			
	CO2	Understand the behavior of a	arches under differe	nt Ioadir	ng condit	ions.		K	(3			
	CO3	Understand the behavior of b	ouilding frames unde	er variou	s loading	condition	ons	P	(3			
	CO4	Analyze indeterminate struction collapse loads and plastic hir		nalysis t	echnique	es to dete	ermine	P	(3			
	CO5	CO5 Understand fundamentals theory of the Finite Element Method										
UNIT-I	Cabl	es and Suspension Bridges			Pe	riods: 0	9					
UNIT-II	Arch					riods: 0						
Arches as stru same and diffe	uctural for erent lev	orms –Types of arches – Two vels – Determination of norma	hinged and Three Il thrust, radial shea	hinged pr r and be	parabolic ending m	arches oment.	with supp	orts at the	CO2			
UNIT-III	Anal	ysis of Trusses	4		Pe	riods: 0	9					
Analysis of trus	isses w s by for	rith internal and external reduce method	ndancy with maxim	um one	redunda	ant of sin	nply supp	orted and	СОЗ			
UNIT-IV	Plast	tic Analysis of Structures			Pe	riods: 0	9					
<ul> <li>Shape facto</li> </ul>	r – Load	te axial problems – Beams in d factor – Plastic hinge and mo und theorems	pure bending – Pla echanism – Plastic	stic mor analysis	ment of r	esistance erminate	e – Plasti beams a	c modulus ind frames	CO4			
UNIT-V	Finite	e Element Method			Pe	riods: 0	9					
Introduction – Functional Ap	Discre proxima		-: :: : : : : : : : : : : : : : : : :	olygig								
		tization of structure – Step in ation methods – Analysis of on	n Finite Element Ar ne dimensional and	two dim	ensional	element	– Class s	ification of	CO5			
		tization of structure – Step ir ation methods – Analysis of on	ne dimensional and	two dim	ensional	element	S		CO5			
Lecture Period Text Books		tization of structure – Step ir	e dimensional and	two dim	ensional	element	– Class s otal Perio		CO5			

- 2. Bhavikatti,S.S, Structural Analysis, Vol. 1 & 2, Vikas Publishing House Pvt. Ltd., New Delhi, 2010, 4th Edition
- 3. B.C.Punmia, Ashok Kumar Jain, Arun K. Jain, "Theory of Structures", Laxmi Publications Pvt. Ltd, 2017, 13th Edition
- Arun Shyam, Karuna Basker, Structural Analysis, Medtech Publisher, 2019
- Junuthula Narasimha Reddy, An introduction to the finite element method, McGraw Hill, 1993.

Dr.S. SUNDARARAMAN, M. Tech., Ph.L. Professor & Head Department of Civil Enga Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering ANT RESERVED AND RESERVE

Department of Qivil 2849

2. A.7. 129

# Reference Books

- 1. Dr.R.P. Rethaliya, Structural Analysis-I, Atul Prakashan Publisher, 2020
- 2. Dr. Suresh R. Parekar, H.M. Somayya, Structural Analysis- I, Nirali Prakashan Publisher, 2014
- 3. Wang. C. K., Intermediate Structural Analysis, McGraw Hill Publishing Co., Tokyo, Fourth Edition, 2017.
- 4. Jindal, R. L., Indeterminate Structural Analysis, S. Chand and Company. New Delhi, 2000.
- 5. P.Seshu, "Finite Element Analysis", PHI Learning Private Limited, New Delhi 2012

#### Web References

- 1. https://nptel.ac.in/courses/105105166/
- 2. https://onlinecourses.nptel.ac.in/noc20\_ce35/unit?unit=50&lesson=51
- 3. https://nptel.ac.in/courses/105101085/

# COs/POs/PSOs Mapping

COs		Program Outcomes (POs)													ecific 'SOs)
	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	2	1	-			-				1	3	3
2	3	3	3	2	1		-		14-1				1.	3	3
3	3	3	3	2	1	-	-	-	-	-			1	3	3
4	3	3	3	2	1	-	-	-		-			1	3	3
5	3	3	3	2	1	-	-	i	-	-	-	-	1	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

# **Evaluation Method**

Assesment		Cont	inuous As	End Semester	T-4-1		
Assessment	CAT1	CAT2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	1	0	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus.

Dr.S. SUNDARARAMAN, M. Tech., Pn.2..

Prefessor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department	Civil	Engineering	Progran	nme: B.	Tech.							
Semester	VI		Course	Exam T	уре: ТЕ							
Course Code			Perio	ds/Wee	ek	Cre	edit	Max	imum Ma	arks		
Course Code	U23CE	EE612	L	Т	Р	(	······································	CAM	ESE	TM		
Course Name	Pollut	tion Control and Monitoring	3	0	0		3	25	75	100		
D	A:	nd Naine Ballution										
Prerequisite		nd Noise Pollution		-1-1-4-					T 5-14			
	On co	mpletion of the course, the stude	ents Will be	able to	)					apping st Leve		
Course Outcome	CO1	Describe the principles of the bio required to ensure adequate quali						es that ar		(2		
	CO2	Analyze the sources, effect of air	pollution, air	quality	monito	ring an	d con	trol system	ı. <b>F</b>	(3		
	CO3	Use advanced methods for mo			eling fo	or nois	e po	llution an	d P	(3		
1.084	CO4	O4 Understand the generation and preventive measures of solid waste.										
	CO5 Analyze the method of sanitation for various field									(2		
UNIT – I		R POLLUTION & CONTROL				Perio	ds: 0	9				
Natural process	s-polluti	on due to industrial, agricultural a	nd municipa	l waste	s-limitat	ions of	disp	osal by dil	ution-BO	D		
		ns - Oxygen Sag Curve-Water poll								CO1		
UNIT – II	AIR P	OLLUTION AND CONTROL				Perio	ds: 0	9		L		
Pollution and th	heir sou	rces-effects of pollution on huma	n health, ve	getatio	n and d	limate	preve	ention and	control	of		
		d air-pollution surveys and sampling								CO2		
	11010						311 00	ind or region	ation			
UNII – III	NOISE	POLLUTION AND CONTROL							2001			
						Perio	ds: 0	9		n:		
Sound and No	oise: Sc	ources of noise pollution - envir	onmental a	nd indu	ıstrial n	Perio	ds: 0	9 s of noise	pollutio			
Sound and No fundamentals o	oise: So of sound	ources of noise pollution – envir I generation, propagation etc; sour	onmental a	nd indu	ıstrial n	Perio oise; e vel me	ds: 0 effects ters -	9 s of noise types, co	pollutio			
Sound and No fundamentals o Measures for pi	oise: So of sound revention	ources of noise pollution - envir	onmental a	nd indu	ıstrial n	Perio oise; e vel me	ds: 0 effects ters - trol le	9 s of noise types, co	pollutio			
Sound and No fundamentals o Measures for pi UNIT – IV	oise: So of sound revention	ources of noise pollution – environments of noise pollution – environments of noise; environments waste management	onmental and measure	nd indu ment; s strial no	ustrial nound le	Perio oise; e vel me ise con Perio	ds: 09 effects ters – trol le ds: 09	9 s of noise types, co gislation.	pollutio mponent	s, cos		
Sound and No fundamentals o Measures for pi UNIT – IV Source charact	oise: So of sound revention SOLID reristics	ources of noise pollution – envir I generation, propagation etc; sour on and control of noise; environmen O WASTE MANAGEMENT – quantities – collection methods	onmental and measurental and indu	nd indument; s strial no	ustrial nound le pise; no hiques -	Perio oise; e vel me ise con Perio - sanita	ds: 09 effects ters – trol le ds: 09	9 s of noise types, cogislation. 9 ndfill – inc	pollutio mponent	s, cos		
fundamentals o Measures for pi <b>UNIT – IV</b> Source charact	oise: So of sound revention SOLID resistics compost	ources of noise pollution – environments of noise pollution – environments of noise; environments waste management	onmental and measurental and indu	nd indument; s strial no	ustrial nound le pise; no hiques -	Perio oise; e vel me ise con Perio - sanita	ds: 00 effects ters – trol le ds: 00 ary lar	9 s of noise types, co gislation. 9 ndfill – inc	pollutio mponent	s, cos		
Sound and No fundamentals o Measures for properties of the UNIT – IV Source charact and pyrolysis, countr – V	oise: So of sound revention SOLID reristics compost ENVIR	ources of noise pollution – environment generation, propagation etc; sour and control of noise; environment of waste management – quantities – collection methods ing, aerobic and anaerobic- economic commental sanitation	onmental and measurental and indu	nd indument; s strial no al techr posting	ustrial nound le oise; no niques -	Perio oise; e vel me ise con Perio - sanita ng and Perio	ds: 0 effects ters – trol le ds: 0 ary lan reuse ds: 0	9 s of noise types, co gislation. 9 ndfill — inc e.	pollutio	CO4		
Sound and No fundamentals of Measures for property of the Norce Charact and pyrolysis, country of football of foot	solution solution is solution in the solution is solution is solution in the solution in the solution is solution in the solution is solution in the solution in the solution is solution.	purces of noise pollution – environment generation, propagation etc; sour an and control of noise; environment waste management – quantities – collection methods ing, aerobic and anaerobic- economic commental sanitation isease-principles of food sanitation	onmental and measurental and industrial and disposamics of common-sanitation	nd indument; s strial no al techr posting	ustrial nound le pise; no niques - ; recycli	Perio oise; evel meriose con Perio - sanita ng and Perio restau	ds: 09 effects ters - trol le ds: 09 ery lai reuse ds: 09 erants	s of noise types, cogislation. ndfill — ince. and othe	pollutio mponent ineration	CO4		
Sound and No fundamentals of Measures for property of the North Pr	of sound revention SOLID reristics compost ENVIR od to de- quality	ources of noise pollution – environment generation, propagation etc; sour and control of noise; environment of waste management – quantities – collection methods ing, aerobic and anaerobic- economic commental sanitation	onmental and measurental and industrial and disposamics of comon-sanitation	nd indument; s strial no al techr posting n of king steuriza	ustrial nound le bise; no niques - ; recycli tchens, tion of r	Perio oise; evel merio se con Perio sanita ng and Perio restau nilk-HT	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rrants ST ar	9 s of noise types, co gislation. 9 ndfill – inc e. 9 and othe and LTLT pr	pollutio mponent ineration er caterir			
Sound and No fundamentals o Measures for properties of the Measures for properties of the Measures of the Meas	solution in the control of sound revention solution solution in the control of th	purces of noise pollution — environment generation, propagation etc; sour an and control of noise; environment waste management — quantities — collection methods ing, aerobic and anaerobic- economiconmental sanitation isease-principles of food sanitation changes in milk-milk as carrier of i	onmental and measurental and industrial and disposimics of common-sanitation onfection-passect to the direction and the	nd indument; s strial no al techriposting n of kirteuriza ection of an al techriposting n of kirteuriza ection of al techriposting n of al techriposting n of kirteuriza ection of al techriposting n of al technique n o	ustrial nound le bise; no niques - ; recycli tchens, tion of r	Perio oise; evel merio se con Perio sanita ng and Perio restau nilk-HT	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rrants ST ar	9 s of noise types, co gislation. 9 ndfill – inc e. 9 and othe and LTLT pr	pollutio mponent ineration er caterir	CO4		
Sound and No fundamentals o Measures for properties of the Measures for properties of the Measures of the Meas	of sound revention SOLID eristics compost ENVIR od to dequality itation.	purces of noise pollution — environment of generation, propagation etc; sour and control of noise; environment of waste management — quantities — collection methods ing, aerobic and anaerobic- economic contents and anaerobic economic contents anaerobic economic contents and anaerobic economic contents ana	onmental and measurental and industrial and disposimics of common-sanitation onfection-passect to the direction and the	nd indument; s strial no al techriposting n of kinteriza ection on t.	ustrial nound le bise; no niques - ; recycli tchens, tion of r	Perio oise; evel merio se con Perio sanita ng and Perio restau nilk-HT	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rants ST ar	s of noise types, co gislation.  ndfill – inc e.  and othe nd LTLT pr and solar r	pollutio mponent ineration er caterin rocesses novemen	CO4		
Sound and No fundamentals of Measures for properties of the North Properties o	of sound revention SOLID eristics compost ENVIR od to dequality itation.	purces of noise pollution — environment of generation, propagation etc; sour an and control of noise; environment of waste management — quantities — collection methods ing, aerobic and anaerobic- economic confidence of the control	onmental and measurental and industrial and disposamics of common-sanitation fection-passect to the dir	nd indument; s strial no al techriposting n of kinteriza ection on t.	ustrial nound le bise; no niques - ; recycli tchens, tion of r	Perio oise; evel merio se con Perio sanita ng and Perio restau nilk-HT	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rants ST ar	9 s of noise types, co gislation. 9 ndfill – inc e. 9 and othe and LTLT pr	pollutio mponent ineration er caterin rocesses novemen	CO4		
Sound and No fundamentals of Measures for properties of the Measures for properties of the Measures for properties of the Measures of the Meas	solise: Solise: Solise: Solise: Solid revention SOLID reversities compost ENVIR od to dequality itation. Inside the Is:45	purces of noise pollution — environment of generation, propagation etc; sour an and control of noise; environment of waste management — quantities — collection methods ing, aerobic and anaerobic- economic commental sanitation of food sanitation changes in milk-milk as carrier of its Orientation of buildings with respet to buildings for a healthy residentia to a support of the sanitation of buildings with respet to buildings for a healthy residentia to a support of the sanitation of buildings with respet to buildings for a healthy residentia to a support of the sanitation of buildings with respet to buildings for a healthy residential to a support of the sanitation of buildings with respet to buildings for a healthy residential to a support of the sanitation of buildings with respet to buildings for a healthy residential to a support of the sanitation of buildings with respet to buildings for a healthy residential to a support of the sanitation of buildings with respect to the	onmental and measurer and disposamics of common-sanitation fection-pasect to the dirl environment of the common of	nd indument; s strial no al techr posting n of kit steuriza ection ont.	ustrial nound le bise; no liques - chens, tion of preva	Perio oise; evel me ise con Perio - sanita ng and Perio restau nilk-HT illing wi	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rants ST ar	s of noise types, co gislation.  ndfill – inc e.  and othe nd LTLT pr and solar r	pollutio mponent ineration er caterin rocesses novemen			
Sound and No fundamentals of Measures for properties of the North Properties o	solise: Solise: Solise: Solise: Solid revention SOLID reristics compost ENVIR and to display the solid requality itation. Inside the series of	purces of noise pollution — environment of generation, propagation etc; sour and control of noise; environment of waste management — quantities — collection methods ing, aerobic and anaerobic- economic contentation and anaerobic- economic contentation of food sanitation changes in milk-milk as carrier of ito it is orientation of buildings with respete buildings for a healthy residentia — Tutorial Periods:  s, "Air Pollution Control Engineering in the properties of the propert	onmental and measurental and disposamics of common-sanitation infection-pastect to the direction infection	nd indument; s strial no al techriposting n of kind steuriza ection ont.	ustrial nound le pise; no piques - ; recycli tchens, tion of rof preva	Perio oise; evel merise con Perio - sanita ng and Perio restau nilk-HT illing wi	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rants ST ar inds a	s of noise types, co gislation.  ndfill – inc e.  and othe and LTLT pr and solar r  otal Perior	pollutio mponent ineration er caterir rocesses novemen	CO4		
Sound and No fundamentals of Measures for properties of the Measures for properties of the Measures for properties of the Measures of the Meas	solver so	purces of noise pollution — environment of generation, propagation etc; sour an and control of noise; environment of waste management — quantities — collection methods ing, aerobic and anaerobic- economic commental Sanitation of food sanitation changes in milk-milk as carrier of its Orientation of buildings with respet to buildings for a healthy residentia    Tutorial Periods:  "Environmental Pollution Monitorin Wang, Norman C. Pareira, Yung	onmental and measurer tal and industrial and industrial and industrial and dispose mics of common-sanitation fection-pased to the direction practical environmental enviro	nd indument; s strial no al techr posting n of kit steuriza ection on t. al Perio d press ol",New	ustrial nound le pise; no piques - ; recyclicthens, tion of prevaludes: - pigue 201	Perio oise; evel meriose con Perio sanita ng and Perio restau nilk-HT illing wi	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rants ST ar inds a	s of noise types, co gislation.  ndfill – inc e.  and othe and LTLT pr and solar r  otal Perior )Limited 2	pollutio mponent ineration er caterir rocesses novemen	CO4		
Sound and No fundamentals of Measures for properties of the Measures for properties of the Measures for properties of the Measures of the Meas	solise: Solise: Solise: Solise: Solise: Solid revention   Solid re	purces of noise pollution — environ description propagation etc; sour an and control of noise; environment of WASTE MANAGEMENT — quantities — collection methods ing, aerobic and anaerobic- economic CONMENTAL SANITATION isease-principles of food sanitatic changes in milk-milk as carrier of it Orientation of buildings with respete buildings for a healthy residentia   Tutorial Periods:  s, "Air Pollution Control Engineering "Environmental Pollution Monitoring and control in the contro	onmental and measurer tal and industrial and industrial and industrial and dispose mics of common-sanitation fection-pased to the direction practical environmental enviro	nd indument; s strial no al techr posting n of kit steuriza ection on t. al Perio d press ol",New	ustrial nound le pise; no piques - ; recyclicthens, tion of prevaludes: - pigue 201	Perio oise; evel meriose con Perio sanita ng and Perio restau nilk-HT illing wi	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rants ST ar inds a	s of noise types, co gislation.  ndfill – inc e.  and othe and LTLT pr and solar r  otal Perior )Limited 2	pollutio mponent ineration er caterir rocesses novemen	CO4		
Sound and No fundamentals of Measures for properties of the Measures for properties of the Measures for properties of the Measures of the Meas	solise: Solise: Solise: Solise: Solise: Solid revention   SOLID revention   SOLID revention   ENVIR   od to d   -quality   itation.   nside the   Is:45   e Nevers   Chopkar   ice K. V   e + scier   oks	purces of noise pollution — environment of generation, propagation etc; sour and control of noise; environment of waste management — quantities — collection methods ing, aerobic and anaerobic- econor content of an anaerobic principles of food sanitation changes in milk-milk as carrier of ito Orientation of buildings with respete buildings for a healthy residentian — Tutorial Periods:  Tutorial Periods:  S., "Air Pollution Control Engineering "Environmental Pollution Monitoring Wang, Norman C. Pareira, Yung noce media LLC,2004.	onmental and measured tal and industrial and industrial and industrial and disposarics of components of components of the direction of the dir	nd indument; s strial no al techriposting n of kinder ection on t.  al Period d press ol", New "Air P	ustrial nound lecoise; no iniques - itchens, ition of prevalution in age intollution	Perio oise; evel merio see con restau nilk-HT illing wi ernatic Contro	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rrants ST ar inds a	s of noise types, co gislation.  ndfill – inc e.  and othe and LTLT pr and solar r  otal Perior )Limited 2	pollutio mponent ineration er caterir rocesses novemen	CO4		
Sound and No fundamentals of Measures for properties of the North Properties o	soise: So of sound revention SOLID reversitics compost Defends to describe the soil of the	purces of noise pollution — environ generation, propagation etc; sour an and control of noise; environment waste management — quantities — collection methods ing, aerobic and anaerobic- economic commental Sanitation of the commental properties of food sanitation of buildings with respect to the commental properties of the commental prop	onmental and measurer tal and industrial and industrial and industrial and industrial and dispose mics of common-sanitation fection-pasect to the direct to the direct in	nd indument; s strial no al techriposting n of kinsteuriza ection ont. al Period d pressol", New "Air P	ustrial nound lecoise; no iniques - itchens, ition of prevalution in age intollution	Perio oise; evel merio see con restau nilk-HT illing wi ernatic Contro	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rrants ST ar inds a	s of noise types, co gislation.  ndfill – inc e.  and othe and LTLT pr and solar r  otal Perior )Limited 2	pollutio mponent ineration er caterir rocesses novemen	CO4		
Sound and No fundamentals of Measures for properties of the North Properties o	soise: So of sound revention SOLID reversitics compost of to do quality itation. Inside the soil see K. Verential see K. Vere	purces of noise pollution — environ degeneration, propagation etc; sour an and control of noise; environment of WASTE MANAGEMENT — quantities — collection methods ing, aerobic and anaerobic- economic control and anaerobic- economic control and anaerobic properties of food sanitation of buildings with respect to the control and the c	onmental and measurer and disposamics of common-sanitation fection-pasted to the direction in the image of th	nd indument; s strial no al techr posting n of king ection ont.  al Period pressol", New "Air P  WS Publiw-Hill.	ustrial nound le pise; no iiques - ; recycli tchens, tion of prevaled age into ollution	Perio oise; evel merio se con Perio - sanita ng and Perio restau nilk-HT illing wi	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rants ST ar inds a	s of noise types, co gislation.  ndfill – inc e.  and othe and solar r  otal Perio )Limited 2 gineering",	pollutio mponent ineration er caterir rocesses novemen	CO4		
Sound and No fundamentals of Measures for properties of the Measures for properties of the Measures for properties of the Measures of the Meas	soise: So of sound revention SOLID revention sompost ENVIR od to dequality itation. Inside the series of the soie	purces of noise pollution — environ generation, propagation etc; sour an and control of noise; environment waste management — quantities — collection methods ing, aerobic and anaerobic- economic commental Sanitation of the commental properties of food sanitation of buildings with respect to the commental properties of the commental prop	onmental and measurental and measurental and industrial and industrial and industrial and dispose mics of common-sanitation of the direction-pased to the direction of the direc	nd indument; s strial no al techriposting n of kiteteuriza ection ont.  al Period pressol",New "Air P  WS Public W-Hill. g, Wiley	ustrial nound le bise; no liques - ; recyclitichens, tion of prevaled age infollution	Perio oise; evel merio se con Perio - sanita ng and Perio restau nilk-HT illing wi  7. cernatic Contro Compa	ds: 0: effects ters - trol le ds: 0: ary lai reuse ds: 0: rants ST ar ands a  To onal(P	s of noise types, co gislation.  ndfill – inc e.  and othe and solar r  otal Perio )Limited 2 gineering",	pollutio mponent ineration er caterir rocesses novemen	CO4		

Pholoenana

Department of Civil Engineering

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

#### Web References

- 1. https://nptel.ac.in/courses/105102089/
- 2. http://www.ilocis.org/documents/chpt55e.htm
- 3. https://nptel.ac.in/courses/105/102/105102089

# COs/POs/PSOs Mapping

COs		Program Outcomes (POs)												Program Specifi Outcomes (PSO:		
	PO1	PO2	PO3	PO4	PO5	P06	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	2	3	3	3		-		-	1-	Life		-	2	3	3	
CO2	3	3	3	3			-			Jojan.		•	3	1	3	
CO3	3	3	3	3	-						1-	-	3	2	3	
CO4	2	3	3	3	1					11		110	2	2	3	
CO5	3	3	3	3	10		respigned to your sol		-		Elekal)		3	2	3	

Correlation Level: 1-Low, 2-Medium, 3- High

### **Evaluation Method**

Assessment		Cont	inuous As	CAM)	End Semester	Total		
Assessment	CAT1	CAT2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks	
Marks	10		5	5	5	75	100	

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus.

Dr.S. SUNDARARAMAN, M.Tech., Ph.:..

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Department	Civil E	ngineerin	ıg "		nme: B.					. TE	
Semester	VI				Catego	ry Code			Exam Type		
	1			Period	s/Week		Credit		num Mark		
Course Code	U23CE	E613		L	T	P	C	CAM	ESE	TM	
Course Name	Buildi	ng Codes	and Requirement	3	0	0	3	25	75	100	
			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \								
Prerequisite	Buildin	g Materia	ls, Basic of Civil Engine	ering					BT Ma	nning	
	On con	pletion o	of the course, the stude	ents will be	able to	•			(Highes		
	CO1	Underst	and importance of Natio	nal Building	Code				K	2	
Course	CO2	L parn v	arious building requirem	ent for build	ling cod	es			K	2	
Outcome	CO3	Identify	various fire and safety re	elated coda	I require	ements			K	(3	
	CO4	Become	aware of different code	s related to	various	buildir	g services		K2		
	CO5 Familiarize the various building bylaws used in building drawings									(2	
INIT		9									
UNIT – I	minologi	os Admir	N TO NATIONAL BUIL	karound an	d need	for code	es and bye la	ws for bu	ildings and	3 004	
land use devel	opment i	n urban co	ontext. Building Permit a	nd Inspecti	on					CO1	
UNIT – II	GENERAL BUILDING REQUIREMENTS Periods:09										
Land Use clas	sification	, Classific	cation of Buildings, Area	a and Heig	ht Limit	ations,	Requirement	s of vario	us parts o	CO2	
Building.		pH 723								002	
UNIT – III	FIRE	)9									
Fire prevention	n life sa	fety Desi	ign and Construction-:	construction	praction	ces and	safety, Ear	th quake	resistant o	of cos	
masonry wall,	Wind loa	d design.	9.0								
LINIT _ IV	BIIII	DING SEE	RVICES				Periods:				
Plumbing, Lig	hting and	ventilation	on, Acoustics, Sound In	sulation ar	d Heat	Insulat	ion in buildir	igs. Nation	nal Buildin	g COA	
Code and pro	visions r	elated to	general building requir	ements, tir	e and i	ne sale	ety, lighting a	and venture	auon, will	, 004	
	tical circu	lation, sus	stainability etc.; Energy	Conservanc	n bullul	ng coc	Periods:	09		L	
UNIT – V	BOIL	DING BY	ent regulations, buildin	a hye laws	archi	ectural	The second of th		uilding By	e	
laws/regulation	ns of sele	ected citie	s with emphasis on zon	ling, archite	ctural c	ontrois,	frame contro	ols etc. Re	equirement	S CO5	
of statutory dr	awings- s	submissio	n drawings, as built drav Tutorial Periods: 0	vings, comp	ical Pe	rawing:	5 _ T	Total Per	iods: 45		
Lecture Perio	ods: 45		Tutoriai Perious. 0	Tiaci	ioai i ci		L				
				Nov and Da	gor Gre	eno Pi	ıhlisher Rou	tledge			
Text Books						CIIO. I C	abilionici. I tou	acago		& Urba	
1 "Ruil	ding Con	struction I	Handbook" by Roy Chuc	alcy and re	0	ication	Dublisher: I	Ministry of	Housing	u 0.5u	
1. "Buil 2. "Har	ndbook o	n Buildin	g Bye-Laws" by Nation	nal Building	Organ	isation.	Publisher: I	Ministry of	Housing		
1. "Buil 2. "Har Pove Reference B	ndbook o erty Allevi ooks	n Building ation, Go	g Bye-Laws" by Natior vernment of India.	nal Building	Organ	isation.	Publisher: I	Ministry of	Housing		
1. "Buil 2. "Har Pove Reference B	ndbook o erty Allevi o <b>oks</b> onal Build	n Building ation, Go	g Bye-Laws" by Nation vernment of India. of India 2005	nal Building	Organ	isation.	Publisher: I	Ministry of	Housing		
1. "Buil 2. "Har Pove Reference B	ndbook o erty Allevi o <b>oks</b> onal Build	n Building ation, Go	g Bye-Laws" by Nation vernment of India. of India 2005	nal Building	Organ	isation.	Publisher: I	Ministry of	f Housing		
1. "Buil 2. "Har Pove Reference Be 1. Nati 2. SP 6	ndbook o erty Allevi ooks onal Build 64 (2001)	n Building ation, Go ding Code , SP 7 (20	g Bye-Laws" by Nation vernment of India. of India 2005 005), Bureau of Indian S	nal Building	Organ	isation.	Publisher: I	Ministry of	r Housing		
1. "Buil 2. "Har Pove Reference B 1. Nati 2. SP 6 3. Nati	ndbook o erty Allevi o <b>oks</b> onal Build 64 (2001) onal Build	n Building ation, Go ding Code , SP 7 (20 ding Code	g Bye-Laws" by Nation vernment of India. of India 2005 005), Bureau of Indian S	Standards	Organ	isation.	Publisher: I	Ministry of	r Housing		
1. "Buil 2. "Har Pove Reference Bo 1. Nation 2. SP 6 3. Nation 4. Ene	ndbook o erty Allevi ooks onal Buik 64 (2001) onal Buik rgy Cons	n Building ation, Godening Coden, SP 7 (20 ding Coden ervation E	g Bye-Laws" by Nation vernment of India. of India 2005 005), Bureau of Indian S 2005 Building Code (ECBC) 20	Standards	Organ	isation.	Publisher: I	Ministry of	r Housing		
1. "Buil 2. "Har Pove Reference B 1. Nati 2. SP 6 3. Nati 4. Ene 5. Buil	ndbook o erty Allevi ooks onal Build 64 (2001) onal Build rgy Cons ding Byel	n Building ation, Godening Coden, SP 7 (20 ding Coden ervation E	g Bye-Laws" by Nation vernment of India. of India 2005 005), Bureau of Indian S	Standards	Organ	isation.	Publisher: I	Ministry of	r Housing		
1. "Buil 2. "Har Pove Reference Be 1. Nati 2. SP 6 3. Nati 4. Ene 5. Buil Web Referer	ndbook o erty Allevi ooks onal Build 64 (2001) onal Build rgy Cons ding Byel nces s://www.i	n Building ation, Gode ding Code , SP 7 (20 ding Code ervation E aws of dif	g Bye-Laws" by Nation vernment of India. of India 2005 005), Bureau of Indian S 2005 Building Code (ECBC) 20	Standards	Organ	isation.	Publisher: I	Ministry of	r Housing		

1. Indowana\_

Department of Civil Engineering

Department of Civil Engo Ship of a substanting College Madaged and Purposent Tolles

Dr.S. SUNDARARAMAN, M.Tecla., Ph.J.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2. A. 7.133

### COs/POs/PSOs Mapping

COs		Program Outcomes (POs) PO1   PO2   PO3   PO4   PO5   PO6   PO7   PO8   PO9   PO10   PO11   PO12													ecific 'SOs)
003	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	2		1	-		11-11	H	- 18		2	2	1
2	3	3	3	2	-	-	-	-		1 - 1			1	1	2
3	3	3	3	2		-				114	OF -UIT	21 -	3	3	2
4	2		2	1	3	T - 7		-		-	11-14	10-20	2	2	1
5	1	-	-	2	3	-	-	-	-	<u> </u>		10-23	3	3	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

### **Evaluation Methods**

		Continu	uous Asse	AM)	End Semester	Total	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

A. Ludavane\_

Dr.S. SUNDARARAMAN, M.Teeh., Ph.L.,
Professor & Head
Department of Civil Engg

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

D. A.7.134

Department		Enginee	ering		Prograi	mme: E	3.Tec	h.				•••••••••••••••••••••••••••••••••••••••
Semester	VI				Course				E End	Semester E	Exam Tv	ne: TE
Course Code	11230	EE614				s/Week			Credit	P	num Ma	
					L	T	P		C	CAM	ESE	
Course Name	Traffic Manag	Engine	ering and		3	0	0		3			TM
Prerequisite	Trans	portation	n Engineeri	na					<u> </u>	25	75	100
1												
	On cor	npletion	of the co	urse, the stude	ents will be	able to	)					lappin
	CO1	Analyz	ze vehicle a	and driver chara	cteristics re	oad cor	dition	ne and	Control		(Highe	
		mecne	311151115 (0 0	iesign effective	and safe tra	insporta	ation:	system	2			₹3
	CO2	Apply	principles of	of road cross-se	ection design	n, curva	ature,	and tr	affic flow	analysis to		⟨2
Course		Optimi	ze nignway	and road intras	structure.							12
Outcome	CO3	Design	n and optim	nize traffic signa	l systems, i	ncludin	g inte	rsectio	ns. inter	changes		(3
		andio	unuabouts	, to improve trai	TIC managei	ment ar	nd ca	Foto				10
	CO4	impien	nent traffi	c regulation	strategies	narkin	g m	anagei	ment, a	nd contro	ol L	(3
	CO5		area to eritin	ance road Salet	v and eπicle	ncv v						
		improv	ements to	luate traffic safe	ts and impr	s, legis	lation	, and i	nfrastruc	ture	P	(2
I – TINU	ELEM	ENTS O	F TRANSF	PORTATION EN	GINEEDIN	ove ove	rall tr	aπic m	anagem riods:09	ent.		
/ehicle characte	eristics li	ke weial	ht size tu	rning radius								
JNIT – II	HIGHV	VAY GE	OMETRIC	gn driver. Road  DESIGN				l De	-:			
JNIT – II ntroduction, roa	HIGHV d cross	VAY GE	OMETRIC	DESIGN Horizontal au				Pe	riods:09			
JNIT – II ntroduction, roa of traffic flow, ur and analysis,	HIGHV d cross interrup	VAY GE section p ted traffi	OMETRIC parameters c flow, Inte	DESIGN				Pe anneliz analysi	riods:09 ation des s, Highw			
JNIT – II ntroduction, roa of traffic flow, ur and analysis, JNIT – III Fixed and vehic	HIGHV d cross interrupt TRAFF	VAY GE section p ted traffic FIC SIGN	OMETRIC parameters c flow, Inte	DESIGN  B. Horizontal cultrupted traffic fl	ves, vertica ow, speed s	al curve studies	s, cha	Pe anneliz analysi Per	riods:09 ation des s, Highw riods:09	sign. Funda ay capacit	amentals y studies	CO2
JNIT – II ntroduction, roa of traffic flow, ur and analysis, JNIT – III Fixed and vehic ordination - Area	HIGHV d cross interrupt TRAFF ele actual	VAY GE section parted traffic FIC SIGN ated sign	OMETRIC parameters c flow, Inte	DESIGN  B. Horizontal cultrupted traffic fluoring cycle length in the cycle length in	ves, vertica ow, speed s	ants for	s, cha and a	Pe anneliz analysi Per	riods:09 ation des s, Highw riods:09	sign. Funda ay capacit	amentals y studies	CO2
JNIT – II Introduction, roa of traffic flow, ur and analysis, JNIT – III Fixed and vehic ordination - Area of roundabouts.	HIGHV d cross interrupt TRAFF ele actua traffic c Road sig	VAY GE section particled traffic FIC SIGN ated sign ontrol - I pns- test	OMETRIC parameters c flow, Inte  NAL hals - Opti Design of s of the sign	DESIGN  E. Horizontal curve traffic floor	ves, vertica ow, speed s	ants for	s, cha and a	Pe anneliz analysi Per	riods:09 ation des s, Highw riods:09	sign. Funda ay capacit	amentals y studies	CO2
JNIT – II  ntroduction, roa of traffic flow, ur and analysis, JNIT – III  ixed and vehic ordination - Area of roundabouts. JNIT – IV	HIGHV d cross interrupt TRAFF ele actua traffic c Road sig	vay GE section p ted traffic FIC SIGN atted sign ontrol - I gns- test FIC REG	OMETRIC parameters c flow, Inte  NAL hals - Opti Design of s of the sign ULATION	DESIGN  E. Horizontal curve traffic floor	ves, vertica ow, speed s gth - Warra n-signalized placement c	al curve studies ants for d interso	s, cha and a sign ection	Perannelizanalysi Perans - Sas. Des	riods:09 ation des s, Highw riods:09 Saturation sign of inf	sign. Funda ay capacit n flow - Si terchanges	amentals y studies gnal co- , Design	CO3
JNIT – II  Introduction, roa  of traffic flow, ur  and analysis,  JNIT – III  Eixed and vehic  ordination - Area  of roundabouts.  JNIT – IV  Regulation of se	HIGHV d cross interrupt TRAFF ele actua traffic c Road sig TRAFF	VAY GE section placed traffic FIC SIGN atted sign ontrol - I gns- test FIC REG	ometric parameters c flow, Inte  NAL hals - Opti Design of s of the sign ULATION	DESIGN  B. Horizontal curvers for the control of th	ves, vertica ow, speed s gth - Warra n-signalized placement c	al curve studies ants for d interso	s, cha and a sign ection	Per Per	riods:09 ation des s, Highw riods:09 Saturation sign of inf	sign. Funda ray capacit n flow - Si terchanges	amentals y studies gnal co- , Design	CO3
JNIT – II  ntroduction, roa of traffic flow, ur and analysis, JNIT – III  Fixed and vehic ordination - Area of roundabouts. JNIT – IV  Regulation of se	HIGHV d cross interrupt TRAFF ele actua traffic c Road sig TRAFF	VAY GE section placed traffic FIC SIGN atted sign ontrol - I gns- test FIC REG	ometric parameters c flow, Inte  NAL hals - Opti Design of s of the sign ULATION	DESIGN  B. Horizontal curvers for the control of th	ves, vertica ow, speed s gth - Warra n-signalized placement c	al curve studies ants for d interso	s, cha and a sign ection	Per Per	riods:09 ation des s, Highw riods:09 Saturation sign of inf	sign. Funda ray capacit n flow - Si terchanges	amentals y studies gnal co- , Design	CO3
JNIT – II  ntroduction, roa of traffic flow, ur and analysis, JNIT – III  Fixed and vehic ordination - Area of roundabouts. JNIT – IV  Regulation of sp Design of parkin accident data an	HIGHV d cross interrupt TRAFF ele actual traffic c Road sig TRAFF peed - Vog g lots — alysis.	VAY GE section placed traffic FIC SIGN ated sign ontrol - I gns- test FIC REG ehicle ar Traffic s	ometric parameters c flow, Inte  NAL hals - Opti Design of s of the sign ULATION hd road use igns - Roa	DESIGN  B. Horizontal cultrupted traffic fluctrupted traffic fluctrupted traffic fluctrupted and under the control of the cont	ves, vertica ow, speed s gth - Warra n-signalized placement c	al curve studies ants for d interso	s, cha and a sign ection	Per Per	riods:09 ation des s, Highw riods:09 Saturation sign of inf	sign. Funda ray capacit n flow - Si terchanges	amentals y studies gnal co- , Design	CO3
JNIT – II  Introduction, roa  of traffic flow, ur  and analysis,  JNIT – III  Fixed and vehic  ordination - Area  of roundabouts.  JNIT – IV  Regulation of sp  design of parkin  accident data an	HIGHV d cross interrupt TRAFF ele actual traffic c Road sig TRAFF deed - Vog g lots — alysis. TRAFF	VAY GE section placed traffic FIC SIGN ated sign ontrol - I gns- test FIC REG ehicle ar Traffic s	ometric parameters c flow, Inter  NAL hals - Opti Design of s of the sign ULATION hd road use igns - Roae  AGEMENT	DESIGN  B. Horizontal cultrupted traffic fluctrupted traffic fluctrupted and under the control of the control o	rves, vertica ow, speed s gth - Warra n-signalized placement of egulations - ifferent loca	al curve studies ants for d interso of signa Parkinq ations -	s, cha and a sign ectior ils.	Per	riods:09 ation des s, Highw riods:09 Saturation sign of inf riods:09 Control iker Acci	sign. Funda ray capacity on flow - Si terchanges : Parking : dent invest	amentals y studies gnal co- , Design studies -	CO2
JNIT – II  Introduction, roa of traffic flow, ur and analysis, JNIT – III  Exced and vehic ordination - Area of roundabouts. JNIT – IV  Regulation of sp Design of parkin accident data an INIT – V  egislation enfor	HIGHV d cross interrupt TRAFF ele actual traffic c Road sig TRAFF peed - Ve g lots — alysis. TRAFF cement	vay GE section placed traffic FIC SIGN ated sign ontrol - I gns- test FIC REG ehicle ar Traffic s IC MAN and edu	ometric parameters c flow, Inte  NAL hals - Opti Design of s of the sign ULATION hd road usi igns - Roa  AGEMENT	DESIGN  a. Horizontal cure rrupted traffic file  mum cycle lensing and unit between the cycle lensing and unit between the cycle lensing and and safety error of markings at different cycle and traffic sofety.	ow, speed some speed s	al curve studies ants for d intersof of signa Parking	s, cha and a sign ection lls. g and Spee	Per Per	riods:09 ation des s, Highw riods:09 Saturation sign of inf riods:09 C Control sker Accid	sign. Funda ray capacity on flow - Si terchanges : Parking si dent invest	amentals y studies gnal co- , Design studies -	CO2
JNIT – II ntroduction, roa of traffic flow, ur and analysis, JNIT – III Fixed and vehic ordination - Area of roundabouts. JNIT – IV Regulation of sp design of parkin accident data an INIT – V egislation enfor	HIGHV d cross interrupt TRAFF ele actual traffic c Road sig TRAFF peed - Vog g lots — alysis. TRAFF cement affic, Tid	vay GE section placed traffic FIC SIGN ated sign ontrol - I gns- test FIC REG ehicle ar Traffic s IC MAN and edu al flow o	parameters c flow, Interpretation of the sign ULATION and road using growth of the sign of	DESIGN  B. Horizontal curerrupted traffic flowers  mum cycle lenging and under the common cycle lenging and under the cycle an	ow, speed some speed s	al curve studies ants for d intersof of signa Parking	s, cha and a sign ection lls. g and Spee	Per Per	riods:09 ation des s, Highw riods:09 Saturation sign of inf riods:09 C Control sker Accid	sign. Funda ray capacity on flow - Si terchanges : Parking si dent invest	amentals y studies gnal co- , Design studies -	CO2
JNIT – II Introduction, roa of traffic flow, ur and analysis, JNIT – III Fixed and vehic ordination - Area of roundabouts. JNIT – IV Regulation of sp Design of parkin accident data an INIT – V egislation enfor egregation of tr ecture Periods	HIGHV d cross interrupt TRAFF ele actual traffic c Road sig TRAFF peed - Vog g lots — alysis. TRAFF cement affic, Tid	vay GE section placed traffic FIC SIGN ated sign ontrol - I gns- test FIC REG ehicle ar Traffic s IC MAN and edu al flow o	ometric parameters c flow, Inte  NAL hals - Opti Design of s of the sign ULATION hd road usi igns - Roa  AGEMENT	DESIGN  B. Horizontal curerrupted traffic flowers  mum cycle lenging and under the common cycle lenging and under the cycle an	ow, speed some speed s	al curve studies ants for d interso f signa Parking ations -	s, cha and a sign ection ils. g and Spee	Per Per	riods:09 ation des s, Highw riods:09 Saturation sign of int riods:09 C Control lker Acci iods:09 ures for ting, Nois	sign. Funda ray capacity on flow - Si terchanges : Parking si dent invest accident ra se barrier.	amentals y studies gnal co- , Design studies - igation -	CO2
JNIT – II Introduction, roa of traffic flow, ur and analysis, JNIT – III Fixed and vehic ordination - Area of roundabouts. JNIT – IV Regulation of sp Design of parkin accident data an INIT – V egislation enfor degregation of tr ecture Periods ext Books	HIGHV d cross interrupt TRAFF tle actual traffic c Road sig TRAFF peed - Vog g lots — alysis. TRAFF cement affic, Tid	vay GE section placed traffic FIC SIGN ated sign ontrol - I gns- test FIC REG ehicle ar Traffic s IC MAN and edu al flow o	parameters c flow, Interpretation of the sign ULATION and road usigns - Road AGEMENT ucation for operation, E	DESIGN  B. Horizontal cure rrupted traffic flow in the content of	gth - Warran-signalized placement of the placement local placement local placement local placement place	al curve studies ants for d interso f signa Parking ations -	s, cha and a sign ection ils. g and Spee ents, s, Stree	Per Per Measset light	riods:09 ation des s, Highw riods:09 Saturation sign of int riods:09 C Control ker Acci iods:09 ures for ting, Nois	sign. Funda ray capacity on flow - Si terchanges : Parking si dent invest accident re se barrier.	amentals y studies gnal co- , Design studies - igation -	CO3
JNIT – II Introduction, roa of traffic flow, ur and analysis, JNIT – III Fixed and vehic ordination - Area of roundabouts. JNIT – IV Regulation of sp Design of parkin accident data and INIT – V Regislation enfort regregation of tr ecture Periods ext Books 1. Khanna.S. K	HIGHV d cross interrupt TRAFF ele actual traffic c Road sig TRAFF peed - Vog g lots — alysis. TRAFF rement affic, Tid : 45	VAY GE section placed traffic FIC SIGN ated sign ontrol - It pns- test FIC REG ehicle ar Traffic s IC MAN and edu al flow o	OMETRIC parameters c flow, Inter NAL hals - Opti Design of s of the sign ULATION hd road usi igns - Roa  AGEMENT ucation for operation, E Tutorial P	DESIGN  B. Horizontal curerrupted traffic flucture and units and u	gth - Warra n-signalized placement of egulations - ifferent loca  Cost of road ne, oneway  Practical	al curve studies ants for d interso f signa Parking ations -	s, cha and a sign ection lls. g and Spee	Per Per Traffice de breaseet ligh	riods:09 ation des s, Highw riods:09 Saturation sign of int riods:09 C Control lker Acci iods:09 ures for ting, Nois	sign. Funda ray capacity on flow - Si terchanges : Parking si dent invest accident ra se barrier.	amentals y studies gnal co- , Design studies - igation -	CO3
JNIT – II Introduction, roa of traffic flow, ur and analysis, JNIT – III Fixed and vehic ordination - Area of roundabouts. JNIT – IV Regulation of sp design of parkin occident data an INIT – V legislation enfor egregation of tr ecture Periods ext Books I. Khanna.S. K 2. S C Saxena	HIGHV d cross interrupt TRAFF tle actual traffic c Road sig TRAFF tleed - Vog g lots - allysis. TRAFF cement affic, Tid : 45	VAY GE section placed traffic FIC SIGN ated sign ontrol - It pns- test FIC REG ehicle ar Traffic s IC MAN and edu al flow o	OMETRIC parameters c flow, Inter NAL hals - Opti Design of s of the sign ULATION hd road usi igns - Roa  AGEMENT ucation for operation, E Tutorial P	DESIGN  B. Horizontal curerrupted traffic flucture and units and u	gth - Warra n-signalized placement of egulations - ifferent loca  Cost of road ne, oneway  Practical	al curve studies ants for d interso f signa Parking ations -	s, cha and a sign ection lls. g and Spee	Per Per Traffice de breaseet ligh	riods:09 ation des s, Highw riods:09 Saturation sign of int riods:09 C Control lker Acci iods:09 ures for ting, Nois	sign. Funda ray capacity on flow - Si terchanges : Parking si dent invest accident ra se barrier.	amentals y studies gnal co- , Design studies - igation -	CO3
JNIT – II Introduction, roa of traffic flow, ur and analysis, JNIT – III Fixed and vehic ordination - Area of roundabouts. JNIT – IV Regulation of sp design of parkin occident data an init – V regislation enfor egregation of tr ecture Periods ext Books I. Khanna.S. K O. S C Saxena reference Book	HIGHV d cross interrupt TRAFF tle actual traffic c Road sig TRAFF peed - Vog g lots — alysis. TRAFF cement affic, Tid : 45	vay GE section placed traffic FIC SIGN ated sign ontrol - In gns- test FIC REG ehicle ar Traffic s IC MAN and edu al flow of	ometric parameters c flow, Inter NAL mals - Opti Design of s of the sign ULATION and road us igns - Roa AGEMENT Ucation for operation, E Tutorial P and Veerara A Textbook	DESIGN  B. Horizontal curerrupted traffic flowing cycle length in the company of	gth - Warran-signalized placement of the placement local of the placement local of the placement of the plac	al curve studies ants for dintersof signal Parking ations - di accid streets I Period	s, cha and a sign ection ils. g and Spee ents, s, Stree ds:	Per Annelizanalysi Per Annelizan	riods:09 ation des s, Highw riods:09 Saturation sign of int riods:09 C Control ker Acci iods:09 ures for ting, Nois Publisher cation, 20	sign. Funda yay capacity on flow - Si terchanges : Parking si dent invest accident re se barrier. tal Periods	gnal co- s, Design studies - igation -	CO3
JNIT – II  Introduction, roa  of traffic flow, ur  and analysis,  JNIT – III  Fixed and vehic  ordination - Area  of roundabouts.  JNIT – IV  Regulation of sp  lesign of parkin  accident data an  INIT – V  legislation enfort  egregation of tr  ecture Periods  ext Books  1. Khanna.S. K  2. S C Saxena  eference Book  1. Kadiyali L R,	HIGHV d cross interrupt TRAFF ele actual traffic c Road sig TRAFF peed - Vog g lots — alysis. TRAFF rement affic, Tid : 45  , Justo ( and S P s Principle	vay GE section placed traffic ric SIGN ated sign ontrol - I gns- test ric REG ehicle ar Traffic s ric MAN and edu al flow o	OMETRIC parameters c flow, Inter NAL hals - Opti Design of s of the sign ULATION hd road usi igns - Roa  AGEMENT Location for operation, E Tutorial P hd Veerara A Textbook	DESIGN  B. Horizontal cultrupted traffic fluctring and up. Lettering and AND SAFETY  BERCHUSTER - Parking red markings at district safety, (Exclusive bus la eriods: -  gavan A. "Highway Engine	gth - Warra n-signalized placement of egulations - ifferent loca  Cost of road ne, oneway  Practical way Engineer ngineering",	ants for dintersof signal Parking attions - dintersof signal attions - dintersof signal attions - dintersof streets dintersof streets dintersof signal attions - dintersof signal attio	s, cha and a sign ection ils. g and Spee ents, s, Stree ds:	Per Annelizanalysi Per Annelizan	riods:09 ation des s, Highw riods:09 Saturation sign of int riods:09 C Control ker Acci iods:09 ures for ting, Nois Publisher cation, 20	sign. Funda yay capacity on flow - Si terchanges : Parking si dent invest accident re se barrier. tal Periods	gnal co- s, Design studies - igation -	CO3
JNIT – II  Introduction, roa of traffic flow, ur and analysis, JNIT – III  Fixed and vehic ordination - Area of roundabouts. JNIT – IV  Regulation of sp Design of parkin accident data an INIT – V  egislation enfor egregation of tr  ecture Periods ext Books  1. Khanna.S. K 2. S C Saxena a eference Book  1. Kadiyali L R, 2. Rangwala, "A	HIGHV d cross interrupt TRAFF le actual traffic c Road sig TRAFF Deed - Vog g lots — allysis. TRAFF cement affic, Tid : 45  , Justo.0 and S P s Principle irport Er	VAY GE section placed traffic FIC SIGN ated sign ontrol - I gns- test FIC REG ehicle and Traffic s IC MAN and edu al flow of C.E.G an Arora, "A	parameters c flow, Interpretation of the sign of the sign ULATION and road usigns - Road AGEMENT ucation for operation, E Tutorial P and Veerara A Textbook Practice of Fing", Charot	DESIGN  B. Horizontal curerrupted traffic fluctions and unitered and unitered and unitered and unitered and unitered and unitered are parking red markings at different affic safety, (Exclusive bus la eriods: -  gavan A. "Highway are publishing Highway Engine are Publishing Hi	gth - Warran-signalized placement of the placement local cost of roadine, oneway in the placement of the pla	al curve studies ants for dintersof signal Parking ations - di accid streets I Period Period Dhanp	s, cha and a sign ection ls. g and Spee ents, s, Stree ds:	Per Per Meass et ligh	riods:09 ation des s, Highw riods:09 Saturation sign of inf riods:09 Control sker Accid tods:09 ures for ting, Nois To Publisher cations, I	sign. Funda yay capacity in flow - Si terchanges : Parking : dent invest accident rese barrier. tal Periods rs, 2015.	gnal co- s, Design studies - igation -	CO2
JNIT – II  Introduction, roa of traffic flow, ur and analysis, JNIT – III  Fixed and vehic ordination - Area of roundabouts. JNIT – IV  Regulation of sp Design of parkin accident data and INIT – V egislation enfor egregation of tr ecture Periods ext Books  1. Khanna.S. K 2. S C Saxena a eference Book 1. Kadiyali L R, 2. Rangwala, "A 3. Indian Road of	HIGHV d cross interrupt TRAFF ele actual traffic c Road sig TRAFF peed - Ve g lots — alysis. TRAFF cement affic, Tid : 45  Justo.C and S P s Principle airport Er Congress	VAY GE section placed traffic FIC SIGN ated sign ontrol - It gns- test FIC REG ehicle ar Traffic s IC MAN and edu al flow of C.E.G ar Arora, "A es and P ngineerin s (IRC),	OMETRIC parameters c flow, Inter NAL mals - Opti Design of s of the sign ULATION and road usi igns - Roa AGEMENT ucation for operation, E Tutorial P and Veerara A Textbook Practice of H ng", Charot Guidelines	DESIGN  B. Horizontal currently traffic flowers and unit of the property of Railway Engine ar Publishing Head of the Design Hea	gth - Warran-signalized placement of egulations - ifferent local practical way Engineering, Khannouse, 2018.	ants for dintersof signal Parking ations - Dhanp	s, cha and a sign ection ils. g and Spee ents, s, Stree ds:	Perannelizanalysi Perans Des I Per Trafficat breaset light	riods:09 ation des s, Highw riods:09 Saturation sign of int cods:09 Control ker Accid iods:09 Ures for ting, Nois To Publisher cations, I	sign. Funda yay capacity on flow - Si terchanges : Parking si dent invest accident re se barrier. tal Periods rs, 2015. 010.	gnal co- s, Design studies - igation -	CO2
JNIT – II Introduction, roa of traffic flow, ur and analysis, JNIT – III Tixed and vehic ordination - Area of roundabouts. JNIT – IV Regulation of sp Design of parkin occident data and INIT – V regislation enfor regregation of tr recture Periods ext Books I. Khanna.S. K Ordination Road	HIGHV d cross interrupt TRAFF ele actual traffic c Road sig TRAFF peed - Vo g lots — alysis. TRAFF rement affic, Tid : 45  Principle sirport Er Congress Congress	VAY GE section placed traffic FIC SIGN ated sign ontrol - It pas- test FIC REG chicle ar Traffic s FIC MAN and eductal flow of the second Pagineering (IRC), s (IRC), s (IRC),	OMETRIC parameters c flow, Inter NAL mals - Opti Design of s of the sign ULATION and road usi igns - Roa AGEMENT ucation for operation, E Tutorial P and Veerara A Textbook Practice of H ng", Charot Guidelines	DESIGN  B. Horizontal cultrupted traffic fluctring and up. Lettering and AND SAFETY  BERCHUSTER - Parking red markings at district safety, (Exclusive bus la eriods: -  gavan A. "Highway Engine	gth - Warran-signalized placement of egulations - ifferent local practical way Engineering, Khannouse, 2018.	ants for dintersof signal Parking ations - Dhanp	s, cha and a sign ection ils. g and Spee ents, s, Stree ds:	Perannelizanalysi Perans Des I Per Trafficat breaset light	riods:09 ation des s, Highw riods:09 Saturation sign of int cods:09 Control ker Accid iods:09 Ures for ting, Nois To Publisher cations, I	sign. Funda yay capacity on flow - Si terchanges : Parking si dent invest accident re se barrier. tal Periods rs, 2015. 010.	gnal co- s, Design studies - igation -	CO3

Department of Civil Engineering

Dr.S. SUNBARARAMAN, M.Tech., Ph.2... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India 2. A.7.135

#### Academic Curriculum and Syllabi 2023 (R - 2023)

#### Web References

- 1. http://www.yorku.ca/yaoguo/tranportation1025/
- 2. http://www.tranportation.cum.edu/~wn0g/2ch6a.pdf
- 3. https://nptel.ac.in/courses/105101087/
- 4. https://nptel.ac.in/courses/105107123/
- 5. https://nptel.ac.in/courses/114106025/

#### COs/POs/PSOs Mapping

COs	- 4	und:	aid .	ntering	Prog	ram O	utcom	es (PO	s)					ram Spe omes (P	
	PO1	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	3	3	2	7-1	- 1		-	-	7-1	411-11	14.12 <b>-</b> 14.1	2	2	1
2	3	3	3	2	-	-		-1			-1-	-	1	1	2
3	3	3	3	2					-				3	3	2
4	2	F 7429	2	1	3	-	-		-	-	-		2	2	1
5	1	-	-	2	3	-		-	-	76-17	BUT-TH	445-197	3	3	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

	10.00	Contin	uous Asse	ssment Marks (C	AM)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAA, M. Tech., Pn.L.,

Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering

2.A.7.136

<b>;</b>	Civil Engineering	Programn	ne: <b>B.T</b> e	ch.				
Semester	VI	Course C			E Fnd S	Semester I	Eyam Tyr	o TE
Course Code	U23CEE615	Periods/V			Credit	***************************************	num Mar	
	0230EE013	L	T	Р	C	CAM	ESE	
Course Name	Urban Planning and Development	3	0	0	3	25	75	100
Prerequisite	Transportation Engineering							la .
	On completion of the course, the stude	nte will be at	olo to				BT M	apping
			JIE LO				(Highes	
Course	CO1 Describe basic issues in urban planco Get knowledge on bearing capacity	nning					P	(2
Outcome	CO3 Formulate plans for urban and rura	y and testing r	nethods	•			P	(2
	CO4 Determine the load carrying capaci	itu et pile ferre	J-4:				K	3
	CO5 Plan and analyse socio economic a	ity of pile foun	dation.		•		····• <del>†</del> ·······	3
UNIT – I	BASIC ISSUES	aspects of urb	an and i	urai pian			K	3
		11.1			Period	s:08		
arous, contact	man settlement, Urban area, Town, City, Business District (CBD), Classification or nal and State level.	Urbanisation, f urban areas	Suburb S – Tre	anisation nd of U	n, Urban rbanisatio	sprawl, F on at Inte	eri-urban ernational,	CO
JNIT – II	PLANNING PROCESS				Dorlod	00		
Principles of Pla	anning – Types and Level of Plan, Stages	in Planning	Droope	Caala	Period	5:08		
Planning Areas,	Surveys and Questionnaire Design.	, in r ianining	riocess	- Goals	s, Objecti	ves, Delir	neation of	co
JNIT – III	DEVELOPMENT DI ANG DI AN CODATI							
	DEVELOPMENT PLANS, PLAN FORMU	JLATION AND	DEVAL	JATION	Period	e:10		
Scope and Cont	DEVELOPMENT PLANS, PLAN FORMU ent of Regional Plan, Master Plan, Detailed	Developmon	t Dlan I	Javalann			Tronofo	1
. Dorolopinone	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Developi	Developmen	t Plan, [	Developm			Transfer	cos
JNIT – IV	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D	Developmen ment of small EVELOPMEN	t Plan, [ town an	Developm d smart o	nent Conf	rol Rules, e studies		cos
JNIT – IV Site Analysis,	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Pr	Developmen ment of small EVELOPMEN	t Plan, I town an NT PRO	Developm d smart o	nent Conf	rol Rules, e studies		
JNIT – IV Site Analysis,	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Pr Implementation, Financing of Urban Developmentation, DEVELOPMENTAND MARKET PROPERTY AND MARKET PROPERTY AND MARKET PLANNING PROPERTY PLANNING PROPERTY PLANNING PROPERTY PLANNING PROPERTY PRO	Developmen ment of small EVELOPMEN oject Formul opment Projec	t Plan, I town an NT PRO ation – cts.	Developm d smart of JECTS Evaluat	nent Conf	trol Rules, e studies s:09 n Implem		
JNIT – IV  Site Analysis,  Constraints and  JNIT – V	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Pr Implementation, Financing of Urban Developmentation, DEVELOPMENTAND MASYSTEM	Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT	t Plan, I town an NT PRO ation — cts.	Developm d smart of JECTS Evaluat	nent Conf cities-cas Periods cion, Pla	trol Rules, e studies s:09 n Implen	nentation,	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V Town and Cour	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Primplementation, Financing of Urban Developmentation, DEVELOPMENTAND MASYSTEM  http://doi.org/10.1007/	Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT	t Plan, [ town an IT PRO ation — cts. T OF UR	Developm d smart of JECTS Evaluat	nent Conf cities-cas Periods cion, Pla	trol Rules, e studies s:09 n Implen	nentation,	CO4
JNIT – IV  Site Analysis,  Constraints and  JNIT – V  Town and Cour  Regulations, Invo	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Developing PLANNING AND DESIGN OF URBAN Down Design, Planning Standards, Proposition of Urban Developmentation, Financing of Urban Developmentation, DEVELOPMENTAND MASYSTEM Development of Public, Private, NGO, CBO and Diversity Planning Act, Land Acquisition and Diversity Planning Act, Private, NGO, CBO and Diversity Planning Act, Private, NGO, CBO and Diversity Planning Act, Private, NGO, CBO and Private Planning Act, Private Planning Act, Private, NGO, CBO and Private Planning Planning Act, Private Planning Pl	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries	It Plan, It town an IT PRO. ation — cts. If OF UR It Act etas.	Developm d smart of JECTS Evaluat BAN c., Urbar	nent Continent Cont	rol Rules, e studies s:09 n Implen s:10	nentation,	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V Town and Cour Regulations, Invo	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Developing PLANNING AND DESIGN OF URBAN Down Design, Planning Standards, Proposition of Urban Developmentation, Financing of Urban Developmentation, DEVELOPMENTAND MASYSTEM Development of Public, Private, NGO, CBO and Development of Public, Private, NGO, CBO and Proposition of Public, Private, NGO, CBO and Public, Private, NGO, Pr	Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT	It Plan, It town an IT PRO. ation — cts. If OF UR It Act etas.	Developm d smart of JECTS Evaluat BAN c., Urbar	nent Continent Cont	trol Rules, e studies s:09 n Implen	nentation,	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V Town and Cour Regulations, Involvecture Periods Sext Books	Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Pr Implementation, Financing of Urban Develope LEGISLATION, DEVELOPMENTAND MA SYSTEM http Planning Act, Land Acquisition and Divement of Public, Private, NGO, CBO and 1:45  Tutorial Periods: -	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical F	at Plan, I town an NT PRO ation — cts. FOF UR t Act etcs. Periods:	Developm d smart of JECTS Evaluat BAN c., Urban	Periods Periods Periods Periods To	rol Rules, e studies s:09 n Implem s:10 ng Standa	nentation,	CO4
JNIT – IV  Site Analysis, Constraints and JNIT – V  Sown and Cour Regulations, Involvecture Periods ext Books  1. Goel, S.I.	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Proposition of Urban Developmentation, Financing of Urban Developmentation, Developmentation of Urban Development SYSTEM  and Diversity Planning Act, Land Acquisition and Diversity Planning Act, Land Acquisition and Diversity Planning Act, Private, NGO, CBO and Diversity Planning Act, Private, P	Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement Beneficiaries Practical F	at Plan, I town an NT PRO. ation — cts. FOF UR Act etcs. Periods:	Developmed smart of JECTS Evaluation BAN c., Urban	Periods Periods Periods Periods To	rol Rules, e studies s:09 n Implem s:10 ng Standa	nentation,	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V  Town and Cour Regulations, Involvecture Periods ext Books  1. Goel, S.I. 2. Singh V.	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Proposition of Urban Developmentation, Financing of Urban Developmentation, DEVELOPMENTAND MASYSTEM Control of Public, Private, NGO, CBO and Control of Public, Private, NGO,	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical Feep and Deep a, Kalpaz publ	at Plan, I town an NT PRO ation — cts. T OF UR Act etcs. Periods: D publica	Developm d smart of JECTS Evaluat  BAN c., Urban - utions, Ne	Periods Periods Periods To	rol Rules, e studies s:09 n Implem s:10 ng Standa tal Period	nentation, ards and	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V Sown and Courtegulations, Involvecture Periods ext Books  1. Goel, S.I. 2. Singh V. 3. Edwin S.	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Proposition of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Developmentation, Proposition of Urban Development Of Public, Private, NGO, CBO and Development of Public, Private, NGO, CBO and Development and Management, Design Development Development and Management, Design Development De	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical Feep and Deep a, Kalpaz publ	at Plan, I town an NT PRO ation — cts. T OF UR Act etcs. Periods: D publica	Developm d smart of JECTS Evaluat  BAN c., Urban - utions, Ne	Periods Periods Periods To	rol Rules, e studies s:09 n Implem s:10 ng Standa tal Period	nentation, ards and	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V  Sown and Cour Regulations, Involve ecture Periods ext Books  1. Goel, S.I. 2. Singh V. 3. Edwin S. eference Book	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Proposition of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Development MasySTEM  and Charles M.Becker, Studies in Urban Development and Management, Design Revitalised Urban Administration in India Mills and Charles M.Becker, Studies in Urban Standards (1988).	d Developmen ment of small EVELOPMEN Toject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical Feep and Deep a, Kalpaz publican development	t Plan, I town an NT PRO. ation — cts. TOF UR Act etcs. Periods: D publication, ent, A W	Developmed smart of JECTS Evaluate BAN c., Urban - utions, Net Delhi, 20 /orld Ban	nent Contities-cas Periods ion, Pla Periods Periods Too ew Delhi,; 01 k publica	rol Rules, e studies s:09 n Implem s:10 ng Standa tal Period	nentation, ards and	CO4
INIT – IV Site Analysis, Constraints and INIT – V  Own and Cour Legulations, Involvecture Periods ext Books  1. Goel, S.I. 2. Singh V. 3. Edwin S. eference Book  1. Tamil Na	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Proposed Implementation, Financing of Urban Developmentation, DEVELOPMENTAND MASYSTEM Control of Public, Private, NGO, CBO and Contr	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical Feep and Deep a, Kalpaz publican development of Government of the ment of the project o	It Plan, It town an IT PROVATION TO THE IT TO	Developmed smart of JECTS Evaluate BAN  c., Urban tions, Net Delhi, 20 forld Ban	Periods Periods Periods Periods To  Vew Delhi,	rol Rules, e studies s:09 n Implements:10 ng Stand: tal Period 2002	nentation, ards and	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V Sown and Cour Regulations, Involvecture Periods ext Books  1. Goel, S.I. 2. Singh V. 3. Edwin S. eference Book 1. Tamil Na 2. Goel S.L	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Proposed Implementation, Financing of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Development Acquisition and Diversity Planning Act, Land Acquisition and Diversity Planning Act, Land Acquisition and Diversity Planning Act, Private, NGO, CBO and Diversity Planning Act, Private, NGO, CBO and Diversity Planning Periods: -  Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development and Management, Diversity Planning Act 1971, Co., Urban Development A	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical Feep and Deep an development of Bovernment of Bovernment of Beep and Deep ment of Beep and Deep	It Plan, It town an IT PROVENTION TO THE IT TO	Developmed smart of STECTS Evaluate BAN c., Urban - utions, Ne Delhi, 20 /orld Ban Nadu,Che ations, N	Periods Periods Periods Periods To  Vew Delhi,	rol Rules, e studies s:09 n Implements:10 ng Stand: tal Period 2002	nentation, ards and	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V  Sown and Cour Regulations, Invo ecture Periods ext Books  1. Goel, S.I. 2. Singh V. 3. Edwin S. eference Book  1. Tamil Na 2. Goel S.L. 3. Thooyava	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Produced Implementation, Financing of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Development Acquisition and Diverse of Public, Private, NGO, CBO and Development and Management, Design Revitalised Urban Administration in India Mills and Charles M.Becker, Studies in Urban Development and Management, Design Urban Development and Management, Design, Urban Development and Management, Design, Urban Development and Management, Design, K.R., Human Settlements — A Planning	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical Feep and Deep an development of Bovernment of Bovernment of Beep and Deep ment of Beep and Deep	It Plan, It town an IT PROVENTION TO THE IT TO	Developmed smart of STECTS Evaluate BAN c., Urban - utions, Ne Delhi, 20 /orld Ban Nadu,Che ations, N	Periods Periods Periods Periods To  Vew Delhi,	rol Rules, e studies s:09 n Implements:10 ng Stand: tal Period 2002	nentation, ards and	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V  Town and Cour Regulations, Invo ecture Periods ext Books  1. Goel, S.I. 2. Singh V. 3. Edwin S. eference Book 1. Tamil Na 2. Goel S.L. 3. Thooyava 4. Publication	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Proposed Implementation, Financing of Urban Developmentation, Financing of Urban Developmentation, DEVELOPMENTAND MASYSTEM  Antry Planning Act, Land Acquisition and Divement of Public, Private, NGO, CBO and Extra 1985.  Lurban Development and Management, Design Revitalised Urban Administration in India Mills and Charles M.Becker, Studies in Urban Development and Management, Design Urban Development and Management, Design, Urban Development and Management, Design, Urban Development and Management, Design, K.R., Human Settlements — A Planning Dons, Chennai, 2005	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical Feep and Deep an development of Bovernment of Bovernment of Beep and Deep ment of Beep and Deep	It Plan, It town an IT PROVENTION TO THE IT TO	Developmed smart of STECTS Evaluate BAN c., Urban - utions, Ne Delhi, 20 /orld Ban Nadu,Che ations, N	Periods Periods Periods Periods To  Vew Delhi,	rol Rules, e studies s:09 n Implements:10 ng Stand: tal Period 2002	nentation, ards and	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V  Town and Cour Regulations, Involve ecture Periods ext Books  1. Goel, S.I. 2. Singh V. 3. Edwin S. eference Book  1. Tamil Na 2. Goel S.L. 3. Thooyava 4. Publicatio	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Produced Implementation, Financing of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Developmentation, Financing of Urban Development and Acquisition and Diversity Planning Act, Land Acquisition and Diversity Planning Act, Land Acquisition and Diversity Planning Act, Private, NGO, CBO and Diversity Planning Act, Private, NGO, CBO and Diversity Planning Private, NGO, CBO and Diversity Planning Act 1971, One of the Private Implementation in India Mills and Charles M.Becker, Studies in Urban Development and Management, Description, Urban Development and Management, Description, Chennai, 2005	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical Feep and Deep an development of Bovernment of Beneficiaries of the pan development of Bovernment of Beneficiaries of the pan development of Bovernment of	It Plan, It town an IT PROVENTION TO THE IT TO	Developmed smart of STECTS Evaluate BAN c., Urban - utions, Ne Delhi, 20 /orld Ban Nadu,Che ations, N	Periods Periods Periods Periods To  Vew Delhi,	rol Rules, e studies s:09 n Implements:10 ng Stand: tal Period 2002	nentation, ards and	CO4
JNIT – IV Site Analysis, Constraints and JNIT – V  Town and Cour Regulations, Invo ecture Periods ext Books  1. Goel, S.I. 2. Singh V. 3. Edwin S. eference Book  1. Tamil Na 2. Goel S.L. 3. Thooyava 4. Publication //eb References 1. https://arc	ent of Regional Plan, Master Plan, Detailed Rights, Special Economic Zones- Develope PLANNING AND DESIGN OF URBAN D Layout Design, Planning Standards, Proposed Implementation, Financing of Urban Developmentation, Financing of Urban Developmentation, DEVELOPMENTAND MASYSTEM  Antry Planning Act, Land Acquisition and Divement of Public, Private, NGO, CBO and Extra 1985.  Lurban Development and Management, Design Revitalised Urban Administration in India Mills and Charles M.Becker, Studies in Urban Development and Management, Design Urban Development and Management, Design, Urban Development and Management, Design, Urban Development and Management, Design, K.R., Human Settlements — A Planning Dons, Chennai, 2005	d Developmen ment of small EVELOPMEN oject Formul opment Project ANAGEMENT Resettlement d Beneficiaries Practical Feep and Deep an development of Bovernment of Beneficiaries of the pan development of Bovernment of Beneficiaries of the pan development of Bovernment of	It Plan, It town an IT PROVENTION TO THE IT TO	Developmed smart of STECTS Evaluate BAN c., Urban - utions, Ne Delhi, 20 /orld Ban Nadu,Che ations, N	Periods Periods Periods Periods To  Vew Delhi,	rol Rules, e studies s:09 n Implements:10 ng Stand: tal Period 2002	nentation, ards and	CO4

1. Indoesana

Department of Civil Engineering

shi ushanishoo iy

Dr.S. SUNDAKARAMAN, M.Teck., Pa.L.,
Professor & Head
Department of Civil Engg
Sri Manakuta Vinayagar Engg. College
Madagadipet, Puducherry, India

Academic Curriculum and Syllabi 2023 (R - 2023)

#### COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PO	s)			vid (C)		ram Spe omes (P	
	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3
1	2	1	2	2	1	2	4-6	-	4-4	7/ <b>3</b> - 4.	- E		3	3	2
2	2	1	2	2	1	2	1	-		11.5			3	2	3
3	2	3	3	2	2	3	1	13.	-c			-	3	2	3
4	2	3	3	2	2	3	1	-	-				2	2	2
5	2	3	3	2	2	3	1	-	-	-		mie Topië	3	3	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

		Contin	uous Asse	ssment Marks (C	AM)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAA, M.Tech., Ph.:.. Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering

# **ANNEXURE IV**

Honours/Minors Degree Programme

Green Technologies and Sustainable Engineering

SI. No	Course Code	Course Title	Category	Р	erio	ds	Credits	M	ax. Mari	ks
•	Jour		Jacogory	L	Т	P	Credits	CAM	ESM	Total
1	U23CEX401	Energy, Environment and Renewable Energy Technologies	PC	3	1	0	4	25	75	100
2	U23CEX502	Green Technologies & Renewable Energy Systems	PC	3	1	0	4	25	75	100
3	U23CEX603	Sustainable Energy Systems	PC	3	1	0	4	25	75	100
4	U23CEX704	Sustainability in the Built Environment	PC	3	1	0	4	25	75	100
5	U23CEX805	Green management	PC	3	1	0	4	25	75	100

Professor & Head

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. College

Madagadipet, Puducherry, India

Department of Civil Engineering

JESSE - RESERVICE IN THE THE PROPERTY OF THE P

81	4条			31		

Carlotte Car

paramental half to toem regal

		Engineering			***************************************	rs/Minors			
Semester	IV		Cours	se Cate	gory Co	de: PC   Er	nd Semes	ter Exam	Туре:
Course	U23C	EX401	Pe	riods/We	eek	Credit		ximum Ma	
Code			L	Т	Р	С	CAM	ESE	TN
Name	Energ Energ	y Environment and Renewable y Technologies	3	1	0	4	25	75	100
Prerequisite	Enviro	onmental Science							
		completion of the course, the stud						BT Ma	
	CO1	Understand the nexus between ene	ergy, enviro	nment a	and susta	ainable dev	elopment		(4
Course	CO2	Appreciate energy ecosystems and	its impact	on envir	onment				(4
Outcomes		Learn basics of various types of rer				echnologies		<del></del>	(4
	CO4	Serve as bridge to advanced course	es in renew	·					
	CO5	Understand about energy and econ			Cigy				(4
UNIT- I	ENEF						Perio	do: 12	(4
ntroduction to	the ne	exus between energy, environment	and sustai	nable de	evelopm	ent, Energy	COURCOS	Over view	7
mergy scenar	io. Ene	un as the source of energy, fossil fergy consumption models – Specific	Energy Co	nsumpti	resource on.	s - overvie	w of glob	al/ India's	co
UNIT- II	ECOL	OGY AND ENVIRONMENT s of ecosystems, - energy flow in r	***************************************				Perio	ds: 12	<u></u>
UNIT - III	RENE	WABLE SOURCES OF ENERGY					Perio	ds: 12	
onversion. Wirind, wind she nergy conversioners	nd Ene ear, tur rsion s an ene ources		thesis, Pho spheric bou power Con ics and a hnologies:	tovoltaic undary la tent, wi	convers ayers, cla nd spee	sion and Phassification, d monitorin	factors in	al energy fluencing mit, wind	
UNIT - IV	OTHE	R ENERGY SOURCES AND SYSTI	EMS				Perio	ds: 12	
Radioisotope and conversio	Thermons	ar fission and fusion-Geothermal e al power plants; hydrogen energy, oelectric Generator (RTG), Bio-sola	Magneto	hudro di	mamia /	AUTON	energy sit	es, site	CO4
UNIT - V	ENER	GY AND ECONOMY					Perio	ds: 12	
ficiency – ene	Jigy -	cs: gross domestic product (GDP energy and economics – energy: se	) and ene ecurity – ed	rgy – e quity – ε	nergy menvironm	narket and ental susta	society - inability ir	- energy idex and	CO
Lecture Peri	ods: 4	5 Tutorial Periods: 15	Practica	Period	ds: -		Total	Periods:	60
ext Books									
	2000.	Naaub, Jean- Philippe,"Energy and							
Ristinen, Rol	bert A. iley, 20	Kraushaar, Jack J. AKraushaar, Ja	ack P. Rist	inen R	obert A	"Energy an	d the En		

Dr.S. SUNDARARAMAN, M. Tech., Pr.L.

Department of Civil Engineering

Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2. A. 7.143

#### Academic Curriculum and Syllabi 2023 (R - 2023)

#### Reference Books

- 1. Energy and the Challenge of Sustainability, World Energy assessment, UNDP, N York, 2000.
- 2. Solar Energy: principles of Thermal Collection and Storage, S.P. Sukhatme, Tata McGraw-Hill (1984).
- 3. D. Y. Goswami, F. Kreith and J. F. Kreider, Principles of Solar Engineering, Taylor and Francis, Philadelphia, 2000.
- 4. Wind Energy Conversion Systems, L.L. Freris, Prentice Hal 1990.
- 5. Geothermal Energy: From Theoretical Models to Exploration and Development by Ingrid Sober and Kurt Bucher, Springer, 2013.
- 6. Ocean Energy: Tide and Tidal Power by R. H. Charlier and Charles W. Finkl, Springer 2010

#### COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PO	s)					ram Spe omes (P	
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	3		1	2	3	3	1	-	1		-		v-lin	3
2	2	3	-	1	2	3	3	1	T - T	1	2		-	. 16-150	3
3	2	3	-	1	2	3	3	1	-	1	2	-		-	3
4	2	3	-	1	2	3	3	1		1		2	-		3
5	2	3	- 1	1	2	3	3	1		1			-	e leighte	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

		Cont	inuous Assessi	ment Marks (CA	M)	End	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Semester Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.b.
Professor & Head
Department of Civil Engg

Department of Civil English
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Course Name Systems Prerequisite Environmental Science  On completion of the course, the students will be able to STA Mapper (Higher Leve Co1 Understand the significance of green technologies.  Course Outcomes Outcomes  Outcom	Department	Civil Engineering	Progra	amme :	Honour	s/Mino	rs.			
Course Code Code Code Code Code Code Course Name Systems Syst	Semester	V	Cours	e Cate	gory Code	e: PC	End	Semeste	r Exam T	ype: TE
Course Name Systems  Prerequisite Environmental Science  On completion of the course, the students will be able to Systems  On completion of the course, the students will be able to Systems  On completion of the course, the students will be able to Systems  On completion of the course, the students will be able to Systems  On completion of the course, the students will be able to Systems  Outcomes  Outcomes  Outcomes  Out Junderstand the significance of green technologies. K4  CO2 Junderstand green production techniques and eco-friendly processes. K4  OO3 Junderstand green production techniques and eco-friendly processes. K4  UNIT-I FUNDAMENTALS OF GREEN TECHNOLOGY Periods: 12  Twelve principles of green technologies in sustainable development, industrial ecology, role of industrial ecology in green technology. Role of green technologies in sustainable development, industrial ecology, role of industrial ecology in green technology. Role of green technologies in green technology. Role of green technology in green technology.  Cleaner development mechanisms, role of industry, reuse, reduce and recycle, raw material substitution; wealth from waste; carbon credits, carbon trading, carbon sequestration, eco labeling; Oxidation technology for waste water treatment- Cavitation, Fenton chemistry, photocatalysis and hybrid processes.  UNIT-III ECO FRIENDLY PROCESSES  Periods: 12  Energy efficient design of processes-photo, electro and sono chemical methods, microwave assisted synthesis, Eco-friendly and costeffective materials, recyclable and environment friendly materials, green orduction systems.  UNIT-IV GREEN BUILDINGS & SUSTAINABLE URBANIZATION  Periods:	Course	U23CEX502	1					7		
Prerequisite Environmental Science  On completion of the course, the students will be able to  Course Outcomes  Outc	Code	0200EX002	Ly Luw	uh(T) s	P	( C	)	CAM	ESE	TM
On completion of the course, the students will be able to  Course Course Outcomes Ou			3	12	0		4	25	75	100
On completion of the course, the students will be able to  (High Course Course Outcomes  Outcome	Prerequisite	Environmental Science						<u> </u>		
Course Outcomes Outco		On completion of the course, the student	ts will b	e able	to				(Hi	ghest
Outcomes  Outcom		CO1 Understand the significance of green t	echnolo	gies.						K4
CO3   Understand green production techniques and eco-friendly processes.   K4		CO2 Analyze cleaner development mechan	ism (CD	M).		•••••••				K4
CO4 Understand various aspects of green buildings  K4 CO5 Analyze renewable energy systems as a part of green technology.  WATERIONAMENTALS OF GREEN TECHNOLOGY  Twelve principles of green chemistry, definition & significance of Green technology, factors affecting green technology. Role of green technologies in sustainable development, industrial ecology, role of industrial ecology in green technology.  UNIT-II CLEANER DEVELOPMENT MECHANISM  Periods:12 Cleaner development mechanisms, role of industry; reuse, reduce and recycle, raw material substitution; wealth from waste; carbon credits, carbon trading, carbon sequestration, eco labeling; Oxidation technology for waste water treatment- Cavitation, Fenton chemistry, photocatalysis and hybrid processes.  UNIT-III ECO FRIENDLY PROCESSES  Periods: 12 Energy efficient design of processes-photo, electro and sono chemical methods, microwave assisted synthesis, eco-friendly and costerfective materials, recyclable and environment friendly materials, green production systems.  UNIT-IV GREEN BUILDINGS & SUSTAINABLE URBANIZATION  Periods: 12 Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of objuildings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT-V RENEWABLE ENERGY  Periods: 12 Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6 Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Pra	Outcomes	CO3 Understand green production technique	es and	eco-frie	ndly proc	esses.				•••••
CO5 Analyze renewable energy systems as a part of green technology.  UNIT I FUNDAMENTALS OF GREEN TECHNOLOGY Periods: 12  Twelve principles of green chemistry, definition & significance of Green technology, factors affecting green technology. Role of green technologies in sustainable development, industrial ecology, role of industrial ecology in green technology.  UNIT- II CLEANER DEVELOPMENT MECHANISM Periods: 12  Cleaner development mechanisms, role of industry; reuse, reduce and recycle, raw material substitution; wealth from waste, carbon credits, carbon trading, carbon sequestration, eco labeling; Oxidation technology for waste water treatment—Cavitation, Fenton chemistry, photocatalysis and hybrid processes.  UNIT - III ECO FRIENDLY PROCESSES Periods: 12  Energy efficient design of processes- photo, electro and sono chemical methods, microwave assisted synthesis, Eco-friendly and costeffective materials, recyclable and environment friendly materials, green oroduction systems.  UNIT - IV GREEN BUILDINGS & SUSTAINABLE URBANIZATION Periods: 12  Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of objuilding components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V RENEWABLE ENERGY Periods: 12  Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention – Fundamentals and Practices, McGraw-Hill- international 2000		CO4 Understand various aspects of green by	uildinas	······································						
Twelve principles of green chemistry, definition & significance of Green technology, factors affecting green technology. Role of green technologies in sustainable development, industrial ecology, role of industrial ecology in green technology.  UNIT-II   CLEANER DEVELOPMENT MECHANISM   Periods:12   Cleaner development mechanisms, role of industry; reuse, reduce and recycle, raw material substitution; wealth from waste; carbon credits, carbon trading, carbon sequestration, eco labeling; Oxidation technology for waste water treatment- Cavitation, Fenton chemistry, photocatalysis and hybrid processes.  UNIT-III   ECO FRIENDLY PROCESSES   Periods: 12   Energy efficient design of processes- photo, electro and sono chemical methods, microwave assisted synthesis, eco-friendly and costeffective materials, recyclable and environment friendly materials, green production systems.  UNIT-IV   GREEN BUILDINGS & SUSTAINABLE URBANIZATION   Periods: 12   Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of puildings, building components, ventilations, Energy efficient buildings- methods for increasing energy efficiency of puildings, building components, ventilations, Energy efficient buildings- methods for increasing energy efficiency of puildings, building components, ventilations, Energy systems, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT-V   RENEWABLE ENERGY   Periods: 12   Periods: 12   Periods: 12   Periods: 12   Periods: 12   Periods: 13   Periods: 14   Periods: 15   Practical Periods: 15   Practical Periods: 16   Practical Periods: 17   Total Periods: 18   Practical Periods: 19   Practic					technolo	oav.				
technology. Role of green technologies in sustainable development, industrial ecology, role of industrial ecology in green technology.  UNIT-II   CLEANER DEVELOPMENT MECHANISM   Periods:12   Cleaner development mechanisms, role of industry, reuse, reduce and recycle, raw material substitution; wealth from waste; carbon credits, carbon trading, carbon sequestration, eco labeling; Oxidation technology for waste water treatment- Cavitation, Fenton chemistry, photocatalysis and hybrid processes.  UNIT-III   ECO FRIENDLY PROCESSES   Periods: 12   Energy efficient design of processes- photo, electro and sono chemical methods, microwave assisted synthesis, Eco-friendly and costeffective materials, recyclable and environment friendly materials, green production systems.  UNIT-IV   GREEN BUILDINGS & SUSTAINABLE URBANIZATION   Periods: 12   Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of pulidings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT-V   RENEWABLE ENERGY   Periods: 12   Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45   Tutorial Periods: 15   Practical Periods: -   Total Periods: 6   Text Books   1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books   1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000   2. Milli Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute   3. Volker Quaschning, "Understanding Renewable Energy Systems".	UNIT- I					- 3,7·	••••••	Peri		V-1
technology. Role of green technologies in sustainable development, industrial ecology, role of industrial ecology in green technology.  UNIT-II   CLEANER DEVELOPMENT MECHANISM   Periods:12   Cleaner development mechanisms, role of industry, reuse, reduce and recycle, raw material substitution; wealth from waste; carbon credits, carbon trading, carbon sequestration, eco labeling; Oxidation technology for waste water treatment- Cavitation, Fenton chemistry, photocatalysis and hybrid processes.  UNIT-III   ECO FRIENDLY PROCESSES   Periods: 12   Energy efficient design of processes- photo, electro and sono chemical methods, microwave assisted synthesis, Eco-friendly and costeffective materials, recyclable and environment friendly materials, green production systems.  UNIT-IV   GREEN BUILDINGS & SUSTAINABLE URBANIZATION   Periods: 12   Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of pulidings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT-V   RENEWABLE ENERGY   Periods: 12   Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45   Tutorial Periods: 15   Practical Periods: -   Total Periods: 6   Text Books   1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books   1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000   2. Milli Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute   3. Volker Quaschning, "Understanding Renewable Energy Systems".	Twelve princ	iples of green chemistry definition & signifi-	cance o	of Grac	n techno	Noav	facto	re offort	ind area	
Cleaner development mechanisms, role of industry; reuse, reduce and recycle, raw material substitution; wealth from waste; carbon credits, carbon trading, carbon sequestration, eco labeling; Oxidation technology for waste water treatment- Cavitation, Fenton chemistry, photocatalysis and hybrid processes.  UNIT - III   ECO FRIENDLY PROCESSES   Periods: 12  Energy efficient design of processes- photo, electro and sono chemical methods, microwave assisted synthesis, Eco-friendly and costeffective materials, recyclable and environment friendly materials, green production systems.  UNIT - IV   GREEN BUILDINGS & SUSTAINABLE URBANIZATION   Periods: 12  Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of puldings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V   RENEWABLE ENERGY   Periods: 12  Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45   Tutorial Periods: 15   Practical Periods: -   Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill-international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.  3. Volker Quaschning, "Understanding Renewable Energy Systems".	technology. F	Role of green technologies in sustainable deve								
water treatment- Cavitation, Fenton chemistry, photocatalysis and hybrid processes.  UNIT - III   ECO FRIENDLY PROCESSES   Periods: 12 Energy efficient design of processes- photo, electro and sono chemical methods, microwave assisted synthesis, Eco-friendly and costeffective materials, recyclable and environment friendly materials, green production systems.  UNIT - IV   GREEN BUILDINGS & SUSTAINABLE URBANIZATION   Periods: 12 Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of puldings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V   RENEWABLE ENERGY   Periods: 12 Zarious renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45   Tutorial Periods: 15   Practical Periods: -   Total Periods: 6 Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill-international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.  3. Volker Quaschning, "Understanding Renewable Energy Systems".		1000				•				
UNIT - III ECO FRIENDLY PROCESSES  Energy efficient design of processes- photo, electro and sono chemical methods, microwave assisted synthesis, Eco-friendly and costeffective materials, recyclable and environment friendly materials, green production systems.  UNIT - IV GREEN BUILDINGS & SUSTAINABLE URBANIZATION Periods: 12  Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of pulldings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V RENEWABLE ENERGY  Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill-international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.  3. Volker Quaschning, "Understanding Renewable Energy Systems".	from waste; o	carbon credits, carbon trading, carbon seques	stration,	eco la	beling; O	xidatio				
Energy efficient design of processes- photo, electro and sono chemical methods, microwave assisted synthesis, Eco-friendly and costeffective materials, recyclable and environment friendly materials, green production systems.  UNIT - IV GREEN BUILDINGS & SUSTAINABLE URBANIZATION Periods: 12 Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of puildings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V RENEWABLE ENERGY  Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute:  3. Volker Quaschning, "Understanding Renewable Energy Systems".								Peri	ods: 12	<u> </u>
UNIT - IV GREEN BUILDINGS & SUSTAINABLE URBANIZATION Periods: 12  Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of buildings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V RENEWABLE ENERGY  /Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.  3. Volker Quaschning, "Understanding Renewable Energy Systems".	Energy efficie	ent design of processes- photo, electro and so	no cher	nical m	ethods, r	nicrow	ave a			
UNIT - IV GREEN BUILDINGS & SUSTAINABLE URBANIZATION Periods: 12  Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of buildings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V RENEWABLE ENERGY  //arious renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute:  3. Volker Quaschning, "Understanding Renewable Energy Systems".	Eco-friendly a	nd costeffective materials, recyclable and envi	ronmen	t friend	y materia	als, gre	en			CO3
Basic Features, advantages & limitations, Energy efficient buildings- methods for increasing energy efficiency of puildings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V RENEWABLE ENERGY  Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute:  3. Volker Quaschning, "Understanding Renewable Energy Systems".										
puildings, building components, ventilation system, Energy need and supply, use of solar photovoltaic system and sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V RENEWABLE ENERGY  //arious renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC. 2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.  3. Volker Quaschning, "Understanding Renewable Energy Systems".						***************************************				·
Sun-tracking system, Sustainable cities, Sustainable transportation.  UNIT - V RENEWABLE ENERGY  Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC. 2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.  3. Volker Quaschning, "Understanding Renewable Energy Systems".	Basic Feature	es, advantages & limitations, Energy efficient b	ouildings	s- meth	ods for in	ncreasi	ing e	nergy eff	iciency of	<b>.</b>
UNIT - V RENEWABLE ENERGY  //arious renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute:  3. Volker Quaschning, "Understanding Renewable Energy Systems".				suppi	y, use of	solar p	hoto	voltaic sy	stem and	CO4
Various renewable energy sources, Solar Energy Systems: Solar radiations data; Solar energy collection, Storage and applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45		y	itation.					Pori	ode:12	<u> </u>
And applications, Hydro Energy Systems: Resource assessment of micro and small hydro power: WindEnergy Systems, bio-fuels, fuel cells.  Lecture Periods: 45  Tutorial Periods: 15  Practical Periods: -  Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute:  3. Volker Quaschning, "Understanding Renewable Energy Systems".		LL	Solar ra	diations	data: Sc	lar en	erav (	1		<u> </u>
Lecture Periods: 45 Tutorial Periods: 15 Practical Periods: - Total Periods: 6  Text Books  1. M. Lancaster, "Green Chemistry – An introductory text", RSC.  2. Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute:  3. Volker Quaschning, "Understanding Renewable Energy Systems".										
<ol> <li>M. Lancaster, "Green Chemistry – An introductory text", RSC.</li> <li>Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.</li> <li>Reference Books</li> <li>Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000</li> <li>Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.</li> <li>Volker Quaschning, "Understanding Renewable Energy Systems".</li> </ol>										
<ol> <li>M. Lancaster, "Green Chemistry – An introductory text", RSC.</li> <li>Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.</li> <li>Reference Books         <ol> <li>Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000</li> <li>Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.</li> <li>Volker Quaschning, "Understanding Renewable Energy Systems".</li> </ol> </li> </ol>	Lecture Pe	riods: 45 Tutorial Periods: 15	Practic	al Peri	ods: -			Tota	l Periods	:: 60
<ol> <li>Rashmi Sanghi and M.M. Srivastava, "Green Chemistry-Environment Friendly Alternatives", NarosaPublishin House, New Delhi 2009.</li> <li>Reference Books         <ol> <li>Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000</li> <li>Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.</li> <li>Volker Quaschning, "Understanding Renewable Energy Systems".</li> </ol> </li> </ol>	Text Books									
House, New Delhi 2009.  Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.  3. Volker Quaschning, "Understanding Renewable Energy Systems".	1. M. La	ncaster, "Green Chemistry – An introductory te	xt", RS0	<b>)</b> .			•••••••••••••••••			
Reference Books  1. Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000  2. Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.  3. Volker Quaschning, "Understanding Renewable Energy Systems".	2. Rashr	mi Sanghi and M.M. Srivastava, "Green Chemi	stry-Env	ironme	nt Friend	ly Alte	rnativ	es", Nar	osaPublis	hing
<ol> <li>Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000</li> <li>Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.</li> <li>Volker Quaschning, "Understanding Renewable Energy Systems".</li> </ol>	House	e, New Delhi 2009.								
<ol> <li>Paul L. Bishop, Pollution prevention –Fundamentals and Practices, McGraw-Hill- international 2000</li> <li>Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute:</li> <li>Volker Quaschning, "Understanding Renewable Energy Systems".</li> </ol>	Reference B	ooks	r + 41		1 A 3 -	F	CE LACTES	3 %		
<ol> <li>Mili Majumdar, "Energy Efficient Buildings in India" Tata Energy Research Institute.</li> <li>Volker Quaschning, "Understanding Renewable Energy Systems".</li> </ol>	1. Paul L	Bishop, Pollution prevention –Fundamentals	and Pra						00	
3. Volker Quaschning, "Understanding Renewable Energy Systems".										***************************************
,									of India.	
5. B.H Khan, "Non conventional energy resources", Tata McGraw-Hill, New Delhi 2006.										
A A A A A A A A A A A A A A A A A A A	1 1	70 .						f 6: -:1 F		

1. Sudaurama

Department of Civil Engineering

Professor & Head
Department of Civil Engg
Sti Manakula Vinayagar Engg. College
Madagadinet. Puducherov India

#### COs/POs/PSOs Mapping

COs	1			× II	Prog	ram O	utcom	es (PO	s)					ram Spe omes (P	
	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3
1	2	3	-	1	2	3	3	1	-	1		·		-	3
2	2	3	-	1	2	3	3	1	-	1	2	-	-	-	3
3	2	3	-	1	2	3	3	1		1	2	1 (	. 4:5	n =	3
4	2	3	=	1	2	3	3	1	-	1	-	2	-	-	3
5	2	3	-	1	2	3	3	1		1	-	1 2 (72.1)	1 1		3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

1		Cont	inuous Assess	ment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.:.. Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering

2. A.7. 146

	ļ	Engineering	Progra	mme :	Honour	s/Mino	rs.					
Semester	VI ·		Course	e Cateo	gory Cod	e: PC	End	Semeste	r Exam 1	ype: <b>T</b> l		
Course	U23C	EX603	Per	iods/W	··········	Cre	edit	Max	kimum M	arks		
Code			L	T	Р	C	<u> </u>	CAM	ESE	TM		
ivame		inable Energy Systems	3 4	1	0		4	25	75	100		
Prerequisite	Enviro	nmental Science										
	On o	completion of the course, the studen	7				л		(Hi	apping ghest evel)		
	CO1	Analyze the energy landscape and problems using appropriate tools a considering society, health and envir graphical form.	nd tech	niques	followin	g relev	vant	standard	ls	K4		
,	Analyze solar and wind energy systems to solve the complex energy problems using appropriate tools and techniques following relevant standards considering society, health, environment, sustainability and economics besides communicating effectively in graphical form.											
Course Outcomes	Analyze biomass, geothermal, tidal and wave energy systems to solve the complex energy problems using appropriate tools and techniques following relevant standards considering society, health, environment, sustainability and economics besides communicating effectively in graphical form.											
	Analyze electric storage technology systems to solve the complex energy problems using appropriate tools and techniques following relevant standards and latest developments considering society, health, environment, sustainability and economics besides communicating effectively in graphical form											
	Analyze grid integration of renewable energy to solve the complex energy problems using appropriate tools and techniques following relevant standards considering society, health, environment, sustainability and economics besides communicating effectively in graphical form.											
UNIT- I		ENERGY LANDSCAPE AND SUSTAII						1	ods: 12			
ifetime of fo onversion, Fi	ssil fu rst and	y use, National and international energ els, Sustainability and energy use, d second laws ofthermodynamics and neous and average power	Energyo	onvers	ion tech	nologie	es, E	nergy fo	rms and	1		
UNIT- II	SOLA	R AND WIND ENERGY						Peri	ods:12	1		
Principles of solar radiation, Resource foundations, Technology challenges, Sustainability,Solar energy indicand economics, Net Metering; Origin of the wind, Power in thewind, Wind resource basics, Netergytechnologies, Challenges, Sustainability, Windenergy Industry.												
UNIT - III	BIOM	ASS, GEOTHERMAL, TIDAL AND WA	AVE ENI	ERGIE	3			Perio	ods: 12	<u> </u>		
ources of fee liesel and e leothermal	edstoc thanol energy	ks; Biofuels - Bioethanol, Biodiesel, , Biogas, Electricity production,Tran	Algal, J sportation	atropha on, Ch nd t	and Bi allenges echnolog	, Sust ıy, E	ainal lectri	ersion tectorility, Eccity pr	chnology, onomics; oduction,			

Department of Civil Engineering

Dr.S. SUNDARARAMAN, M.Teck., Ph.:...

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. Cellege

Madagadipet, Puducherry, India

#### UNIT - IV ELECTRICITY STORAGE TECHNOLOGIES

Periods: 12

Introduction, Battery energy storage technologies - Lithium-ion batteries, Full cells, Nickel-based batteries, Leadacid batteries, Sodium-sulfur batteries; Hydro energystorage - Applications of pump hydro energy storage plant, Site selection for pump hydroenergy storage plant; Thermal energy storage, Capacitors and applications, Latestdevelopments

CO4

#### UNIT - V GRID INTEGRATION OF RENEWABLE ENERGY

Periods:12

Variability, Intermittency and dispatchability, Electric grid infrastructure, Integratingrenewable energy into the grid, Growing a more efficient grid, The smart grid, Securecommunication in the smart grid; Cogeneration plant and power distribution in industry,Micro grids.

CO5

Lecture Periods: 45

Tutorial Periods: 15

Practical Periods: -

Total Periods: 60

#### Text Books

- 1. Boyle, Godfrey, "Renewable Energy: Power for a Sustainable Future", Oxford University Press, 3rd Edition, 2012.
- 2. efferson W. Tester, Elisabeth M. Drake, Michael J. Driscoll, Michael W. Golay, William A. Peters, "Sustainable Energy (Choosing Among Options)", MIT Press, 2nd Edition, 2012.

#### Reference Books

- 1. Gilbert M. Masters, "Renewable and Efficient Electric Power Systems", John Wiley &Sons, Inc., Hoboken, New Jersey, 2nd Edition, 2013
- 2. Vanek, F.M., Albright, L.D., "Energy Systems Engineering Evaluation and Implementation", McGraw-Hill, 2nd Edition, 2008.
- 3. David MacKay, "Sustainable Energy: Without the Hot Ai"r, UIT Cambridge Ltd., Cambridge, England, 2009.
- 4. Frank Kreith, "Principles of Sustainable Energy Systems,", CRC Press, Taylor and Francis group, 2nd Edition, 2014.

#### COs/POs/PSOs Mapping

COs			darit		Prog	ram O	utcom	es (PO	s)		allielag			ram Spe omes (P	
	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	3	-	1	2	3	3	1		1	· .		-	-	3
2	2	3	_ 0	1	2	3	3	1	-	1	2	-	-		3
3	2	3	-	1	2	3	3	1	-	1	2	-	7_	-	3
4	2	3	-	1	2	3	3	1	-	1	-	2	-	-	3
5	2	3	-	1	2	3	3	1	-	1		-	-	-	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

	a 10	Cont	inuous Assessi	ment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.

Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

V 7 11.0

Department of Civil Engineering

Department		Engineering	Progra	amme :	Honour	s/Minors	U- 1381						
Semester	VII	2 - 4 E	Cours	e Cate	gory Cod	e: PC End	Semeste	r Exam 1	ype: TI				
Course	U23C	EX704	Pei	iods/W	eek	Credit	Max	imum M	arks				
Code			L	T	P	C	CAM	ESE	TM				
Course Name		AINABILITY IN THE BUILT CONMENT	3	1	0	4	25	75	100				
Prerequisite	Enviro	nmental science		***************************************									
, i , , , , , , , , , , , , , , , , , ,	On o	completion of the course, the stud						(Hi	apping ghest evel)				
	CO1	Analyze sustainable urban develop environment using appropriate too considering society, health and en graphical form	ls and tec vironment	hnique: beside:	s following commi	ng relevant unicating ef	standard fectively in	s n	K4				
	is associate es following esides comi	relevan	ıţ	K4									
Course Outcomes	Analyze sustainable buildings to solve complex problems associated with the built environment using appropriate tools and techniques following relevant standards considering society, health and environment besides communicating effectively in graphical form.												
	CO4	Analyze building envelope and services to solve complex problems associated with the built environment using appropriate tools and techniques following relevant standards considering society, health and environment besides communicating effectively in graphical form.											
	CO5	Analyze management of sustainablusing appropriate tools and technisociety, health and environment beform.	iques follo	wing re	elevant s	standards c	onsidering		K4				
UNIT- I	SUST	AINABLE URBAN DEVELOPMENT	T				Perio	ods: 12					
rban develor oncrete and	oment steel;	<ul> <li>Human activities and their effect CO2 contribution from cement and ts insustainable development and contribute</li> </ul>	s; Carbon lother cons	structio	n materi	als; GHG e	material missions	such as - Globa					
UNIT- II		AINABLE SITE PLANNING AND A						ods:12	<u></u>				
	egetati	ning, Principles of site analysis, Impr on; Site analysis - Examples of sitea											
UNIT - III	SUST	AINABLE BUILDINGS					Perio	ds: 12	I				
troduction to	sustaii ro Ene	nable buildings and standards, Green rgy Buildings (NZEB), Examples of c	n buildings lifferent typ	, Energ	y efficier IZEB.	ncy and sus			CO3				

V. Ludaererama

Department of Civil Engineering

generations of Class Engag

Str De and a first the condition of the street of the stre

#### Academic Curriculum and Syllabi 2023 (R - 2023)

#### UNIT - IV BUILDING ENVELOPE AND SERVICES

Periods: 12

Building envelope effect and energy efficiency measures, Renewable energy integration, Sustainable building services, Sustainable construction and materials, Integrated design, Energy use and CO2, Built environment - Aging and susceptibility to natural disasters.

CO4

#### UNIT - V MANAGEMENT OF SUSTAINABLE BUILT ENVIRONMENT

Periods:12

Life cycle planning, Measuring sustainability; Facilities management – Waste management, Improved amenities, Improved transport infrastructure, Social mix, Accessibility issues, Cultural and historical issues.

CO<sub>5</sub>

Lecture Periods: 45

**Tutorial Periods: 15** 

Practical Periods: -

Total Periods: 60

Text Books

1. Alison Cotgrave and Mike Riley, "Total Sustainability in the Built Environment", Macmillan Education, 1st Edition, 2012.

2. Kevin Lynch and Gary Hack, "Site Planning", MIT Press, 3rd Edition, 1984.

#### Reference Books

- 1. William McLean and Pete Silver, "Environmental Design Source Book: Innovative Ideas for a Sustainable Built Environment", RIBA Publishing, 1st Edition, 2021.
- 2. Tim Dixon, John Connaughton, Stuart Green, "Sustainable Futures in the Built Environment to 2050: A Foresight Approach to Construction and Development", John
- 3. Rob Fleming, Saglinda H Roberts, "Sustainable Design for the Built Environment", Routledge Press, London, 1st Edition, 2019
- 4. Charles J. Kibert, "Sustainable Construction: Green Building Design and Delivery", Wiley, 4th Edition, 2021.

#### COs/POs/PSOs Mapping

	COs				-	Prog	ram O	utcom	es (PO	s)		ve a gen		Prog	ram Spe omes (P	ecific (SOs)
T	7 . <del></del>	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
T	1	2	3	n _ 14	1	2	3	3	1	-	1 -	- ap	d inc	14.4	· -	3
	2	2	3	-	1	2	3	3	1	-	1		<u>.</u>	-	-	3
	3	2	3	-	1	2	3	3	1	-	1		-	-	-	3
	4	2	3	-	1	2	3	3	1	-	1	2	-	-	-	3
	5	2	3	-	1	2	3	3	1	-	1	2	-	-	-	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

		Cont	inuous Assessi	ment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAA, M.Tech., PR.L.

Professor & Head
Department of Civil Engg

Şri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

9 A.7.150

Department of Civil Engineering

		Engineering		***************************************		s/Minors.			LEC
Semester	VIII		Cours	e Categ	ory Code	e: PC End	Semeste	r Exam T	ype: TE
Course	U23C	EX805	Per	iods/W	eek	Credit	Max	imum Ma	arks
Code	<u> </u>		L	Т	Р	С	CAM	ESE	TM
Course Name	GREE	N MANAGEMENT	3	1	0	4	25	75	100
Prerequisite	e Enviro	onmental Science							
	On o	ompletion of the course, the stude						(Hi	apping ghest evel)
	CO1	Demonstrate an understanding of the of Green Management	e concep	t, evolu	tion, nat	ure, scope,	and type	S	K4
	CO2	Analyze the Indian corporate struction and Develop strategies for organ practices and address sustainability in	nizations ssues in I	to imp	olement h produc	Green Ma	anagemen	t	K4
Course Outcomes	CO3	Assess indicators of sustainability ar biodiversity and examine alternate the perspective	neories in	ecolog	ical econ	nomics from	an India	n	K4
	CO4	rstand the e financia anagemen	K4						
		Apply knowledge of green tax incredesign in real-world scenarios and sustainability and corporate environm	Develop	есо-со	mmerce				<b>K4</b>
UNIT- I	INTR	DDUCTION TO GREEN MANAGEME					Perio	ods: 12	
he Concept of Management	of Gree in India	n Management; Evolution; nature, sco ; Relevance in twenty first century	ope, impo	rtance a	and types	s; Developir	ng a theor	y; Green	CO1
UNIT- II	ORGA	NIZATIONAL ENVIRONMENT					Perio	ods:12	<u>.</u>
invironmenta	l and s	ructure and Environment; How to ustainability issues for the production and its role in	n of high	-tech c	ompone	nts and ma	aterials, L	ife Cycle	CO2
	* * * * *								
	APPRO	DACHES FROM ECOLOGICAL ECO	NOMICS				Perio	ods: 12	
UNIT - III	sustain	DACHES FROM ECOLOGICAL ECO ability; Eco- system services and the		inable ι	use; Bio-	diversity; I	1		
UNIT - III	sustain ries		eir susta	inable ı	use; Bio-	diversity; I	ndian per		
UNIT - III dicators of standard theo UNIT - IV limate chang	sustain ries ENVII ge busir	ability; Eco- system services and th	eir susta	***************************************			ndian per	spective	CO3
UNIT - III dicators of standard theo UNIT - IV limate chang	sustain ries ENVII ge busir Green	ability; Eco- system services and the RONMENTAL REPORTING AND ISO less and ISO 14064; Green financing;	eir susta	***************************************			ndian per Perio	spective	CO3
UNIT - III ndicators of sternate theo UNIT - IV climate changement; UNIT - V Green tax inc	sustain ries  ENVIF ge busir Green  GREE centives	ability; Eco- system services and the RONMENTAL REPORTING AND ISO less and ISO 14064; Green financing; product management	eir sustai 14001 Financia	l initiativ	ve by UN Green pr	EP; Green	Periodenergy  Periodenergy  Periodenergy	ods: 12 ods:12 n action;	CO3

Dr.S. SUNDARARAMAN, M.Tech., Ph.J.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Department of Civil Engineering

2. A. 7.151

#### Academic Curriculum and Syllabi 2023 (R - 2023)

#### Text Books

- 1. Jazmin Seijas Nogarida, "Green Management and Green Technologies: Exploring the Causal Relationship", ZEW Publications.
- 2. Leo A. Meyer, "The Green Energy Management Book", LAMA books

#### Reference Books

- 1. John F. Whaik, Green Marketing and Management: A global Perspective, Qbase Technologies.
- 2. Richard Maltzman And David Shiden, "Green Project Management", CRC Press Books.
- 3. Andrew S. Winston, "Green and World", Yale Press B

#### COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PO	s)					ram Spo omes (F	
	P01	PO2	PO3	PO4	PO5	P06	P07	PO8	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3
1	2	3		1	2	3	3	1	-	1	-	-	-	-	3
2	2	3	-	1	2	3	3	1	-	1	2	-		-	3
3	2	3	-	1	2	3	3	1	-	1	2	-	_	-	3
4	2	3	-	1	2	3	3	1	-	1	-	2	-	-	3
5	2	3	-	1	2	3	3	1	-	1	-		.hv.l	-	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

		Cont	inuous Assess	ment Marks (CAI	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

\* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department of Civil Engineering

# ANNEXURE V

# V BAUXBINA

#### Professional Elective - II (Offered in Semester V)

U20CEE506

#### **GROUND IMPROVEMENT TECHNIQUES**

LTP C Hrs 0 n 3 45

#### **Course Objectives**

This course should enable the students to

- Study the geotechnical problems in various types of soils and suggestions
- Learn the suitable dewatering techniques
- Learn the appropriate grouting materials and techniques to strengthen the soil.
- Study the stabilization techniques.
- Understand the various geo synthetic materials for soil.

#### **Course Outcomes**

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

CO1 - Assess the geo-technical problems in various types of soils and suggest suitable ground improvement techniques. (K4)

CO2 - Choose suitable dewatering techniques for construction sites where the ground water table is at a higher level. (K4)

CO3 - Select the appropriate grouting materials and techniques to strengthen the soil. (K2)

CO4 - Apply the stabilization techniques for soil. (K3)

CO5 - Understand the design and application of geo synthetics materials.

KNOWLEDGE LEVEL: K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze and K5 - Evaluate

#### **UNIT I INTRODUCTION**

Introduction: Need - methods - suitability - Mechanical modification: principle - Surface compaction: Field compaction and equipments, compaction specification and controls. Vibration methods: dynamic consolidation, vibratory rollers, Vibro floatation.

#### **UNIT II DRAINAGE AND DEWATERING**

(9 Hrs)

Drainage methods: Well point systems, deep well drainage, vacuum dewatering system, design of dewatering system - field permeability tests, dewatering by electro osmosis. Preloading, sand drains, wick drains- Thermal methods case studies.

#### **UNIT III GROUT TECHNIQUES**

(9 Hrs)

Grouting: Classification - Methods - Types - grouts - equipments, grouting design and layout, grout monitoring - applications - Case studies.

#### **UNIT IV STABILIZATION**

(9 Hrs)

Stabilization: cement stabilization, Lime stabilization - chemical stabilization - methods, principles, applications and field control. Stabilization using reinforcement - rock anchor- soil tie backs.

#### **UNIT V GEO SYNTHETICS**

Beng the Other Engli Slatter bla vetapager Edgy, En Cedagerhynt Padaceans Yng (9 Hrs)

Geo synthetics: Geotextiles, Geogrids, Geomembranes, Geonets, Geomats, Geomeshes, principles Design and applications - Case studies.

#### **Text Books**

1. Purushothama Raj, P. "Ground Improvement Techniques", Laxmi Publications, 2020.

2. NiharRanjanPatra, Ground Improvement Techniques, S.Chand Publishers 2012

3. Mittal S, "An Introduction to Ground Improvement Engineering", Medtech Publisher, 2013.

Dr.S. SUNDARARAMAN, M. Tech., Ph. 2...

Professor & Head Department of Civil Engg

Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2.A.7.155

#### **Reference Books**

- 1. Das, B.M. "Principles of Foundation Engineering" 7th edition, Cengage learning, 2016
- 2. Robert M. Koerner , "Designing with Geosynthetics Vol. 1and2", Xlibris; 6 edition, 2012
- 3. Jie Han, Principles and Practice of Ground Improvement, John Wiley and Sons, 2015

#### **Web References**

AND STATE OF THE S

- 1. https://nptel.ac.in/courses/105/108/105108075/
- 2. https://nptel.ac.in/courses/105/103/105103097/
- 3. https://nptel.ac.in/courses/105/101/105101201/

COs/POs/PSOs Mapping

Cos							utcom	1					Outc	ram Sp omes (l	
CUS	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	2	1	2	2		1	-	-	-	-	-	1	2	2	2
CO 2	2	3	3	3	1	2	2		-	-	g ()(=)	1	2	2	2
CO 3	3	3	2	2	2	1		-	1-	-	2	1	2	2	2
CO 4	2	1		74						-	2	1	2	2	2
CO 5	3	3	3	3	2	4.5			-		2	1	2	2	2

Correlation Level: 1- Low, 2 - Medium, 3 - High

Dr.S. SUNDARARAMAN, M.Toch., Pa.

Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

1 1:1

2.4.7.156

#### Professional Elective - IV (Offered in Semester VII)

#### C Hrs **U20CEE716** SITE INVESTIGATION METHODS AND PRACTICES 45

#### **Course Objectives**

This course should enable the students to

- Understand the site investigation, its types and applications
- Gain the knowledge about the geological methods and its characterization
- Familiar with the logging methods, classification and its factors
- Understand the site exploration methods and its factors
- Understand the technical report preparation on site works

#### **Course Outcomes**

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

CO1 - Understand the methods of site investigation through various maps & records. (K2)

CO2 - Characterize the rocks & its test procedures. (K2)

CO3 - Classify the bore hole & prepare a log report for bore hole. (K2)

CO4 - Familiarize with the different insitu tests & sampling procedures. (K2)

CO5 - Write technical report for various site works. (K2)

KNOWLEDGE LEVEL: K1 - Remember, K2 - Understand, K3 - Apply, K4 - Analyze and K5 - Evaluate

#### **UNIT I INTRODUCTION**

(9 Hrs)

Objective(s) of site investigation - various stages in site investigation process - Planning and Desk Study topographic maps, aerial photographs - interpretation of aerial photographs, applications in site investigation, Geological maps, minerals and mining records, soil planning maps, site reconnaissance and local enquiries.

#### **UNIT II GEOLOGICAL METHODS**

Geological methods - different stages, Geological exploration methods -Areal mapping, site mapping and construction mapping-Rock mass characterization- Discontinuities in rocks ,Rock core descriptors , Rock mass classification, RQD, Rock mass rating, Rock structure rating, Q-system- General principle distribution of physical field in subsurface - Electrical resistivity, Seismic refraction methods, their principle, methods of survey, correction to field data, Interpretation and limitations. Index and Mechanical properties of rocks, Laboratory and insitu tests.

#### UNIT III GEOPHYSICAL EXPLORATION

(9 Hrs)

Trial pits, shafts, tunnels, auguring, and different types of drilling methods, their merits and demerits, Bore hole logging techniques (subsurface geophysical exploration) - Need for logging techniques, classification and different types logging methods.

#### UNIT IV SAMPLING METHODS

(9 Hrs)

Soil Exploration methods, samples, sampling procedure, sample disturbances, samplers, Factors controlling spacing and depth of bore hole, Insitu tests, SPT, SCPT, Pressure meter tests, interpretation and application, Index properties, Laboratory testing.

UNIT V REPORT PREPARATION

(9 Hrs)

Technical Report writing, report format, recommendations for earth work structures, highway excavations and drainage works, dams, check report site preparation, investigation during construction and operation.

> INDARARAMAN, M. Toch., Ph.: Professor & Head Department of Civil Enga Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2.4.7.157

#### **Text Books**

- 1. Francis Longstreth Thompson "Site planning in Practice: an Investigation of the Principles of Housing Estate Development" Palala Press, 2016.
- 2. Craig. C "Advances in site investigation practice" Thomas Telford Ltd, 1996
- 3. Joyce, M.D. 'Site Investigation Practice; ESFN. SPON Publishers, 1982.

#### Reference Books

- 1. Blyth F.G.H. and de Freitas M.H., Geology for Engineers, Edward Arnold, London, 2006.
- 2. Bell .F.G.. "Fundamentals of Engineering Geology", B.S. Publications. Hyderabad 2011.
- 3. Dobrin, M.B "An introduction to geophysical prospecting", McGraw Hill, New Delhi, 1988.
- 4. Legget and Karrow, Hand book of Geology in Civil Engineering, McGraw Hill Publishers, 1983.
- 5. Hunt, R.E., Geotechnical Engineering Analysis and Evaluation, McGraw Hill Book Company, 1986.

#### **Web References**

Language Middle Control

. The profess of the service of

The first special production

personal in the second

- 1. https://nptel.ac.in/courses/105103182/
- 2. https://nptel.ac.in/courses/105104167/
- 3. http://www.digimat.in/nptel/courses/video/105103182/L15.html
- 4. https://nptel.ac.in/courses/105/108/105108075/
- 5. https://nptel.ac.in/courses/105/105/105105185/

COs/POs/PSOs Mapping

COs	Program Outcomes (POs)										Program Specific Outcomes (PSOs)				
	P01	PO2	PO3	PO4	PO5	P06	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	11-17	-	-	2	-		-			-	3	3	2	2
CO2	2			7 -	1	P-1-11		49-11	10-11	(n-1)	54 <b>-</b> 41	3	3	2	2
CO3	2	1	1		1	-	-	-	-	i ježaja	54.44	2	3	2	2
CO4	1	1	-	2	1	-		-		· 十事 14.		2	3	2	2
CO5	-	-	2		-	2	-		-	-		3	3	2	2

Correlation Level: 1-Low, 2-Medium, 3- High

1. Indoewane

Dr.S. SUNDARARAMAN, M.Tech., Ph.D.,
Professor & Head

Department of Civil Engg Sri Manakule Vinayagar Engg. College Madagadipet, Puducherry, India

#### Open Elective – III (Offered in Semester -V)

# PROJECT MANAGEMENT FOR

U20HSO504

**ENGINEERS** 

L T P C Hrs

#### **Course Objectives**

- To understand the various concepts and steps in project management.
- To familiarize the students with the project feasibility studies and project life cycle
- To enable the students to prepare a project schedule
- To understand the risk management and project Control process.
- To learn about the closure of a project and strategies to be an effective project manager.

#### **Course Outcomes**

POTENTIAL PROPERTY SOLVER AND ANALYSIS OF THE PROPERTY SOLVER AND

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

CO1 - Interpret the different concepts and the various steps in defining a project. (K2)

CO2 - Examining the feasibility of a project. (K3)

CO3 - Build a schedule for a Project. (K6)

CO4 - Predict the risk associated with a project and demonstrate the project audit. (K2)

CO5 - Analyse the project team and outline the Project closure. (K4)

#### **UNIT I PROJECT MANAGEMENT CONCEPTS**

(9 Hrs)

Project: Meaning, Attributes of a project, Project Life cycle, Project Stakeholders, Classification, Importance of project management, Project Portfolio Management System, Different Project Management Structure, Steps in Defining the Project, Project Rollup – Process breakdown structure – Responsibility Matrices – External causes of delay and internal constraints

#### **UNIT II PROJECT FEASIBILITY ANALYSIS**

(9 Hrs)

Opportunity Studies, Pre-Feasibility studies, and Feasibility Study: Market Feasibility, Technical Feasibility, Financial Feasibility and Economic Feasibility. Financial and Economic Appraisal of a project, Social Cost Benefit Analysis in India and Project Life Cycle.

#### **UNIT III PROJECT SCHEDULING & NETWORK TECHNIQUES**

(9 Hrs)

Scheduling Resources and reducing Project duration: Types of project constraints, classification of scheduling problem, Resources allocation methods, Splitting, Multitasking, Benefits of scheduling resources, Rationale for reducing project duration, Options for accelerating Project completion Developing and Constructing the Project Network (Problems), PERT, CPM; Crashing of Project Network,

#### UNIT IV PROJECT RISK MANAGEMENT AND PROJECT CONTROL (9 Hrs)

Project Risk management; Risk concept, Risk identification, Risk assessment, Risk response development, Contingency planning, Contingency funding and time buffers, Risk response control, and Change control management

Budgeting and Project Control Process, Control issues, Tendering and Contract Administration. Steps in Project Appraisal Process and Project Audits

#### UNIT V PROJECT CLOSURE AND MANAGING PROJECT

(9 Hrs)

Project Closure: Team, Team Member and Project Manager Evaluations. Managing versus Leading a Project: Qualities of an Effective Project Manager, Managing Project Stakeholders, Managing Project Teams: Five Stage Team Development Model, Situational factors affecting team development and project team pitfalls.

Dr.S. SUNDARARAMAN, M. Tech., Ph. L.

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2. A. 7.159

#### **Text Books**

- 1. Erik Larson and Clifford Gray. "Project Management: The Managerial Process". 6th Edn. McGraw Hill Education; 2017.
- 2. Harold Kerzner. "Project Management: A systems approach to Planning, Scheduling and Controlling. 12th Edn. John Wiley & Sons; 2017

#### **Reference Books**

- 1. Meredith, J.R. & Mantel, S. J. "Project Management- A Managerial Approach". John Wiley.: 2017
- 2. Prasanna Chandra. "Projects: Planning, Analysis, Selection, Financing, Implementation, and Review". 9th Edn. McGraw Hill Education; 2019.
- 3. B C Punmia by K K Khandelwal. "Project Planning and Control with PERT and CPM". 4<sup>th</sup> Edn. Laxmi Publications Private Limited; 2016.
- 4. Hira N Ahuja, S.P.Dozzi, S.M.Abourizk. "Project Management". 2nd Edn. Wiley India Pvt Ltd; 2013.
- 5. "A guide to Project Management Body of Knowledge". 6th Edn. Project Management Institute; 2017

#### Web Resources

1. www.pmi.org

man of the second of the second

Age Salar Carons

- 2. www.projectmanagement.com
- 3. https://www.sciencedirect.com/journal/international-journal-of-project-management
- 4. https://nptel.ac.in/courses/110/107/110107081/
- 5. https://nptel.ac.in/courses/110/104/110104073/

#### COs/POs/PSOs Mapping

со	Program Outcomes (POs)								Program Specific Outcomes (PSOs)						
S	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
1	2		1	-	- 100 m	-	-	-	2		2	2		<u>-</u>	
2	1	2	1	-		1	H		1	1	1	1	-		
3	-	1	3	Tac	1	= -	-	-	-		1			44 W	
4	3	1	1	33 <u>-</u> 9-5	1. <u>1</u> =	1	1	9=4	h <u>-</u> -	1	1	3	on <u>e</u> et		
5	3		3	- <u>-</u>	)- <u>-</u> 14	E	<u>-</u>	3	3	2	3	2	H-PAT	-	<b>-</b> 34

Correlation Level: 1-Low, 2-Medium, 3- High

Dr.S. SUNDARARAMAN, M.Tech., Ph.D.,
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2. A.7.160

#### Open Elective – IV (Offered in Semester -VII)

U20ECO705

**IOT AND ITS APPLICATIONS** 

L T P C Hrs 3 0 0 3 45

#### **Course Objectives**

- To impart necessary and practical knowledge of components of Internet of Things.
- To attain the knowledge about different types of architecture and their elements of IoT.
- To understand the concepts of integration of devices and data's.
- To acquire the knowledge about remotely monitor data and control devices.
- To develop skills required to build real-time IoT based projects.

#### **Course Outcomes**

After completion of the course, students will be able to

CO1-Understand internet of Things and its hardware and software components.(K2)

CO2-Demonstrate the Interfacing of I/O devices, sensors & communication modules.(K3)

CO3-Understand the concepts of remotely monitor data and control devices.(K2)

CO4-Build and deploy an various architecture with their elements.(K3)

CO5-Can develop real time IoT based projects.(K3)

## UNIT – I INTRODUCTION TO INTERNET OF THINGS

(9

Hrs)

The technology of the internet of things, making the internet of things, Elements of an IoT ecosystem, design principles for connected devices, Web thinking for connected devices.

### UNIT -II ARCHITECTURE OF IoT

(9

Hrs)

Architectural Overview, Design principles and needed capabilities, IoT Applications, Sensing, Actuation, Basics of Networking, M2M and IoT Technology Fundamentals- Devices and gateways, Data management, Business processes in IoT, Everything as a Service(XaaS), Role of Cloud in IoT, Security aspects in IoT.

#### **UNIT - III ELEMENTS OF IOT**

(9 Hrs)

Hardware Components- Computing (Arduino, Raspberry Pi), Communication, Sensing, Actuation, I/O interfaces.

Software Components- Programming API's (using Python/Node.js/Arduino) for Communication Protocols-MQTT, ZigBee, Bluetooth, CoAP, UDP, TCP.

#### **UNIT - IV IOT APPLICATION DEVELOPMENT**

(9 Hrs)

Solution framework for IoT applications- Implementation of Device integration, Data acquisition and integration, Device data storage- Unstructured data storage on cloud/local server, Authentication, authorization of devices

### **UNIT -V IOT APPLICATIONS**

From spr & Ward Department of Civil Engg

en wangelie Vinayaas Early Cultur

(9

Hrs)

IoT applications for industry: Future Factory Concepts, Brownfield IoT, Smart Objects, Smart Applications, Four Aspects in Business to Master IoT, IoT for Retailing Industry, IoT For Oil and Gas Industry, Opinions on IoT Application and Value for Industry, Home Management, eHealth.

Dr.S. SUNDARARAMAN, M. Tech., Ph.

Professor & Head

Department of Civil Engg

Sri Manakule Vinayagar Engg. College

Madagadipet, Puducherry, India

2.A.7.16

#### **Text Books**

- Vijay Madisetti, Arshdeep Bahga, "Internet of Things, A Hands on Approach", University Press, 3rd/e, Aug 2018.
- 2. Raj Kamal, "Internet of Things: Architecture and Design", McGraw Hill ISBN: 9789352605224, 9789352605224, 2<sup>nd</sup> edition, May 2017
- 3. Dr. SRN Reddy, RachitThukral and Manasi Mishra, "Introduction to Internet of Things: A practical Approach", ETI Labs 2014

#### **Reference Books**

- 1. Jeeva Jose, "Internet of Things", Khanna Publishing House, Delhi, 2012
- 2. Adrian McEwen, "Designing the Internet of Things", Wiley, 2007
- 3. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1 st Edition, Apress Publications, 2013
- 4. CunoPfister, "Getting Started with the Internet of Things", O Reilly Media, 2015
- 5. Pethuru Raj and Anupama C. Raman, "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", CRC Press

6.

#### **Web Resources**

- 1. https://www.i-scoop.eu/internet-of-things-guide/
- 2. https://www.theinternetofthings.eu/
- 3. https://www.udemy.com/course/complete-guide-to-build-iot-things-from-scratch-to-market/
- 4. https://www.coursera.org/learn/iot
- 5. https://onlinecourses.nptel.ac.in/noc21\_ee85/preview

#### COs/POs/PSOs Mapping

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		es
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1	PO1	PSO 1	PSO 2	PSO 3
1	2	2	3	2	H <b>-</b> 94	1 E	9 -35	112-1	14-1	6,217	911218	fer <u>ija</u>		išl ni	
2	3	-	3	2	-	-	-	-	-	-	-	-10	in a fi	N-11	1.
3	2	3	2	-	-	-	_	_	-	-		_	-	- I	-
4	2	2	2	-	-	-	4	-	-	-	3	-		_	(42)
5	2	3	2	27723 21 <b>7</b> 0	3	-	-	-	- 1		3	- m			

Correlation Level: 1-Low, 2-Medium, 3-High

Dr.S. SUNDARARAMAN, M.Tech., Pn.:...
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

# **Annexure VI**

## CHOSEN SKILL ENHANCEMENT COURSES - I (REGULATION 2023)

Department	Civil Engineering Programme: B.Tech.									
Semester	Third	SEC	e Categ		ode: *E	nd Seme	ester Exar	n Type		
Course Code	1122050204	Period	ls / Wee	ek	Credit	Max	imum Ma	rks		
Course Code	U23CES301	L T P						TM		
Course Name	BASIC VASTHU	0	2	-	100	-	100			
UNIT-I	Introduction to Vasthu Shastra			P	eriods:	06	<u> </u>			
Overview of Va	s <b>thu Shastra-</b> Ancient texts and scriptu	res (e.g., Manasar	a. Vishv	vakarr	na Prak	ash)-Role	in huildii	na		
design and plan						aon, non	o in ballali	19		
	cance- Relationship with astrology ar	nd geography Intro	duction	to or	ommon	Vootbu t				
Vasthu Dosh, Sl		id geography-intic	duction	1 10 0	JIIIIIOII	vasınu t	.erms (e.	9.,		
				7						
	Fundamental Principles of Vasthu			P	eriods:	06				
Five Elements (	(Panchabhutas)- Earth, Water, Fire, Air	and Chase				••••••		T		
= =::::::::::::::::::::::::::::::::		, and Space-								
			orth, So	outh, I	East, W	est)-Ausr	oicious ar	nd		
Directions and	their Significance-Importance of care		orth, So	outh, I	East, W	est)-Ausr	oicious ar	nd		
Directions and nauspicious dire	their Significance-Importance of care ections-	dinal directions (N								
Directions and nauspicious dire Vasthu Purusha	their Significance-Importance of care	dinal directions (N								
Directions and nauspicious dire	their Significance-Importance of care ections- a Mandala-Spatial Geometry and Design	dinal directions (N		are, re	ectangul	ar, circula				
Directions and nauspicious directions directions directly asthu Purushasignificance UNIT-III	their Significance-Importance of care ections- a Mandala-Spatial Geometry and Designation Vasthu for Residential Buildings	dinal directions (N	ms (squ	are, re	ectangul	ar, circula	ar) and the			
Directions and inauspicious directions directions directly asthu Purushasignificance UNIT-III Site Selection a	their Significance-Importance of care ections- a Mandala-Spatial Geometry and Designation Vasthu for Residential Buildings and Layout: Criteria for choosing a plot	gn Shapes and for (topography, enviro	ms (squ	are, re	ectangul eriods: ( ntation a	ar, circula <b>06</b> and zonir	ar) and the			
Directions and nauspicious directions directions directly asthu Purushasignificance UNIT-III Site Selection a	their Significance-Importance of card ections- a Mandala-Spatial Geometry and Design Vasthu for Residential Buildings and Layout: Criteria for choosing a plot ont and Design: Ideal placements for va	gn Shapes and for (topography, environing rooms (bedro	ms (squ onment)	are, re Pe ), Orie	ectangulariods: ( eriods: ( entation a	ar, circula  06  and zonin  ooms),	ar) and the			
Directions and nauspicious directions directions directly asthu Purushasignificance  UNIT-III  Site Selection and dentilation and	their Significance-Importance of care ections- a Mandala-Spatial Geometry and Designation   Vasthu for Residential Buildings   and Layout: Criteria for choosing a plot   and Design: Ideal placements for va   Lighting: Importance of natural light ar	gn Shapes and for (topography, environing rooms (bedro	ms (squ onment)	Pe ), Orie itchens	ectangulariods: ( ntation a s, bathro zing nat	ar, circula  06  and zonir  coms),  cural reso	ar) and the			
Directions and nauspicious directions directions directly asthu Purushasignificance  UNIT-III Site Selection and Ventilation and	their Significance-Importance of card ections- a Mandala-Spatial Geometry and Design Vasthu for Residential Buildings and Layout: Criteria for choosing a plot ont and Design: Ideal placements for va Lighting: Importance of natural light ar Vasthu for Commercial Buildings	gn Shapes and form (topography, envirous rooms (bedrond airflow, design ti	onment) coms, ki	People of the property of the	ectangulariods: ( ntation a s, bathro zing nat	ar, circula  06  and zonir  coms),  cural reso	ar) and the			
Directions and nauspicious directions directions directions directions direction and complete the complete th	their Significance-Importance of card ections- a Mandala-Spatial Geometry and Design Vasthu for Residential Buildings and Layout: Criteria for choosing a plot ont and Design: Ideal placements for valuable Lighting: Importance of natural light are vasthu for Commercial Buildings and Design: Principles for efficient works	gn Shapes and form (topography, envirous rooms (bedrood airflow, design to	onment) coms, ki	People of the property of the	ectangulariods: ( ntation a s, bathro zing nat	ar, circula  06  and zonir  coms),  cural reso	ar) and the			
Directions and nauspicious directions directions directions directions display and the control of the control o	their Significance-Importance of card ections- a Mandala-Spatial Geometry and Design Vasthu for Residential Buildings and Layout: Criteria for choosing a plot ont and Design: Ideal placements for va Lighting: Importance of natural light ar Vasthu for Commercial Buildings	gn Shapes and form (topography, envirous rooms (bedrood airflow, design to	onment) coms, ki	People of the property of the	ectangulariods: ( ntation a s, bathro zing nat	ar, circula  06  and zonir  coms),  cural reso	ar) and the			
Directions and nauspicious directions directions directions directions direction and complete Layout and Centil Spaces: [UNIT-V]	their Significance-Importance of card ections- a Mandala-Spatial Geometry and Designate Mandala-	gn Shapes and form (topography, envirous rooms (bedroom airflow, design to space, Placement dement.	onment) coms, ki ps for n	People and I	eriods: ( ntation a s, bathro zing nat eriods: ( meeting	ooms), cural reso	ng urces.	eir		
Directions and nauspicious directions directions directions directions direction and complete Layout and Cetail Spaces: [UNIT-V]	their Significance-Importance of care ections- a Mandala-Spatial Geometry and Designate Layout: Criteria for choosing a plot ont and Design: Ideal placements for valuable Lighting: Importance of natural light are Vasthu for Commercial Buildings and Design: Principles for efficient works Designing for customer flow and engage	gn Shapes and form (topography, envirous rooms (bedroom airflow, design to space, Placement dement.	onment) coms, ki ps for n	People and I	eriods: ( ntation a s, bathro zing nat eriods: ( meeting	ooms), cural reso	ng urces.	eir		
Directions and nauspicious directions directions directions directions direction and complete Layout and Cetail Spaces: [UNIT-V]	their Significance-Importance of card ections- a Mandala-Spatial Geometry and Designate Layout: Criteria for choosing a plot and Layout: Criteria for choosing a plot and Layout: Ideal placements for valuable Lighting: Importance of natural light and Vasthu for Commercial Buildings and Design: Principles for efficient works Designing for customer flow and engage Impact of Vasthu on Business Success successful Vasthu-compliant business	gn Shapes and form (topography, envirous rooms (bedroom airflow, design to space, Placement dement.	onment) coms, ki ps for n	People and I	eriods: ( ntation a s, bathro zing nat eriods: ( meeting	ooms), cural reso	ng urces.	eir		
Directions and nauspicious directions directions directions directions directions disputed by the control of th	their Significance-Importance of card ections- a Mandala-Spatial Geometry and Designate Layout: Criteria for choosing a plot and Layout: Criteria for choosing a plot and Layout: Ideal placements for valuable Lighting: Importance of natural light and Vasthu for Commercial Buildings and Design: Principles for efficient works Designing for customer flow and engage Impact of Vasthu on Business Success successful Vasthu-compliant business	gn Shapes and form (topography, envirous rooms (bedroind airflow, design to space, Placement of the ement.  sees Understanding	onment) coms, ki ps for n	People and I	eriods: ( ntation a s, bathro zing nat eriods: ( meeting	ooms), cural reso	ng urces.	eir		

#### **Evaluation Method**

	Internal Assessment Marks (CAM)						
Assessment	Attendance	Report	Presentation/Demo/Skil Test	Total Marks			
Marks	10	40	50	100			

2. A. 7,165 A

Dr.S. SUNDARARAMAN, M.Tech., Pa.s.,
Professor & Head
Department of Civil Engg
Sei Manakula Vinavagar Engg. College

#### PROCESS SIGLA PHARMOUNDED CONSTRUCT - LINE PERCHAPITALION SIGNATURE

Angle is a support of the support of	
The start of the s	
	-course Code - 123 CE83 Cf.
	indeed of multimodel 1-1849
Combined of old in security is upmade adjust, adapting it, pace to got a light six	
t definition and making historical or common Vandler-learn rag.	
50 parchers and a second of the second of th	Birth J Forestagorica Principles
tale autiación liner las a river constituente enclarar enclarar	
awy mad Conigo Scrapes and Jorda (square, Arosingular, circular) and stand	
temporate and an economic amount of the second	

Purchasilian Markage

1.

-company of Delivery

2. A.7.165

tis of A societies? Denti had twinenend

#### **CHOSEN SKILL DEVELOPMENT COURSES 4 AND 5 (REGULATION 2020)**

U20CES504

SKILL DEVELOPMENT COURSE 4

L T P C Hrs

(Foreign Language / IELTS - I)

0 2 - 30

Student should choose the Foreign Language/IELTS course like Japanese/French/ Germany/IELTS, etc. approved by the Department committee comprising of HoD, Programme Academic Coordinator, Class advisor and language Experts. The courses are to be approved by Academic Council on the recommendation of HOD at the beginning of the semester if necessary, subject to ratification in the next Academic council meeting, Students have to complete the courses successfully. The Committee will monitor the progress of the student and recommend the grade (100% Continuous Assessment pattern) based on the completion of course. The marks attained for this course is not considered for CGPA calculation.

Dr.S. SUNDARARAND, a resp. no.
Professor & Hope
Dogarthywol of Club Engo
So Monard Violatic art Copt. College
So Monard Violatic art Copt. College
So Monard Violatic Acquitions, Base

Dr.S. SUNDARARAMAN, M.Tech., Ph.L..
Professor & Head
Department of Civil Engg

Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2. A.7.166

#### **SKILL DEVELOPMENT COURSE 5**

L T P C Hrs

U20CES505

(Presentation Skills using ICT)

0 0 2 0 30

The methodology used is "learning by doing", a hands-on approach, enabling the students to follow their own pace. The teacher, after explaining the project, became a tutor, answering questions and helping students on their learning experience.

#### CT skills

- · Understand ICT workflow in cloud computing.
- · Manage multitasking.
- · Deal with main issues using technology in class.
- · Record, edit and deliver audio and video.
- Automate assessments and results.

#### Teaching tools

- · Different ways to create audiovisual activities.
- · Handle audiovisual editors.
- · Collaborative working.
- Individualize learning experience.
- · Get instant feedback from students.

Each one of the students will be assigned an ICT Topic and the student has to conduct a detailed study and have to prepare a report, running to 15 or 20 pages for which a demo to be performed followed by a brief question and answer session. The demo will be evaluated by the internal assessment committee for a total of 100 marks. The marks attained for this course is not considered for CGPA calculation.

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.
Professor & Head

Department of Civil Engg-Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

#### **CHOSEN MANDATORY COURSES - REGULATION 2023**

Department	Civil Engineering	Progra	Programme: B.Tech.								
Semester	Third	Cours	e Cate	gory Cod	le: *En	d Semes	ter Exam	Type:			
		Period	ds / We	ek	Credit	Ma	aximum N	larks			
Course Code	U23CEM303	L	т	Р	С	САМ	ES E	ТМ			
Course Name	Climate Change	2	0	0	-	100	-	100			
Prerequisite	-		<u> </u>								
Course Outcome	On completion of the course, the stud	ents will be abl	le to	ined			(H	Mappin ighest evel)			
	CO1 Inspect the characteristics and tem							K2			
	CO2 Analyze past climate, human influe					ıre climat	tes	K3			
	CO3 Analyze the impact of climate chan							K3			
	CO4 Outline the carbon credits and evidences of changes in Environment										
UNIT-I	ATMOSPHERE AND ITS COMPONENT		ism and		CO5 Acquire knowledge on clean development mechanism and mitigation technologies						
				Dor	inde: No	3					
Importance of atmosphere - C	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheri	acteristics of A	erature	nere - \	iods: 06 /ertical f the atr	structure	e of the				
Importance of atmosphere - C rates - Tempera UNIT-II	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheri ature inversion-effects of inversion on pollu GLOBAL CLIMATE	racteristics of A c stability -Temp ution dispersion.	erature	profile o	/ertical f the atr	structure nosphere	e - Lapse				
Importance of atmosphere - Crates - Tempera UNIT-II Account of past	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheri ature inversion-effects of inversion on pollu GLOBAL CLIMATE t climate - Environmental indicators and ins	racteristics of A c stability -Temp ution dispersion. trumental record	erature	profile o	/ertical f the atr	structure nosphere	e - Lapse	CO			
Importance of atmosphere - C rates - Temper UNIT-II Account of past Predicting futur	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheri ature inversion-effects of inversion on pollu GLOBAL CLIMATE to climate - Environmental indicators and instead of the climates - Temperature regime - Extreme	racteristics of A c stability -Temp ution dispersion. trumental record	erature	profile o	/ertical f the atr iods: 06 prints or	structure nosphere S n global v	e - Lapse	CO			
Importance of atmosphere - Crates - Tempera UNIT-II Account of past Predicting futur	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheriature inversion-effects of inversion on pollu GLOBAL CLIMATE tclimate - Environmental indicators and instead in the climates - Temperature regime - Extreme IMPACTS OF CLIMATE CHANGE	racteristics of A c stability -Temp ution dispersion. trumental record c climate events	erature	profile o	/ertical f the atr iods: 06 prints or	structure mosphere	e - Lapse varming-	CO			
Importance of atmosphere - Corates - Tempera UNIT-II Account of past Predicting futur UNIT-III Causes of Climate Chaindustry, Settle	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheri ature inversion-effects of inversion on pollu GLOBAL CLIMATE to climate - Environmental indicators and instead of the climates - Temperature regime - Extreme	racteristics of A c stability -Temp ution dispersion. trumental record e climate events e environment-Natry and Ecosyste s - Projected Imp	erature s - Hum Melting o em - Wa	Per profice Per parties Per pa	/ertical if the atr iods: 06 prints or iods: 06 ile-sea I ources	structure mosphere 6 n global v 6 evel rise - Human	varming- lmpacts Health -	CO			
Importance of atmosphere - Crates - Tempera UNIT-II Account of past Predicting futur UNIT-III Causes of Climosf Climate Chaindustry, Settles in the Projected UNIT-IV	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheriature inversion-effects of inversion on pollution of the atmosphere-Atmospheriature inversion-effects of inversion on pollution of the composition	racteristics of Ac stability -Tempution dispersion.  trumental record e climate events e environment-Nutry and Ecosystes - Projected Impurersible Changes	erature  s - Hum  Melting (  em - Wa  pacts for  s	Per profile control Per p	/ertical if the atr iods: 06 prints of iods: 06 prints of iods: 06 iods: 06 iods: 06	structure mosphere in global v sevel rise - Human ms- Unce	varming- lmpacts Health -	CO			
Importance of atmosphere - Corates - Tempera UNIT-II Account of past Predicting futur UNIT-III Causes of Climate Chain and County, Settle in the Projected UNIT-IV Climate change Climate Sensiti	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheriature inversion-effects of inversion on pollugical culture in the culturates of Climate indicators and instruction of the culturate in the cultur	racteristics of Ac stability -Tempution dispersion.  trumental record eclimate events e environment-Netry and Ecosystes - Projected Impurersible Changes SES oto Protocol-Inter	Is - Hum Melting of em - Water for s	Per profile control Per p	/ertical if the atr iods: 06 prints or iods: 06 ile-sea I ources int Regio	structure mosphere 6 n global v 6 evel rise - Human ns- Unce 6	varming- -Impacts Health - ertainties change-	co			
Importance of atmosphere - Corates - Tempera UNIT-II Account of past Predicting futur UNIT-III Causes of Climate Chaindustry, Settles in the Projected UNIT-IV Climate change Climate Sensition de Environme	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheriature inversion-effects of inversion on pollution of the atmosphere-Atmospheriature inversion-effects of inversion on pollution of the atmosphere of the climate - Environmental indicators and instead in the climates - Temperature regime - Extreme IMPACTS OF CLIMATE CHANGE nate change: Change of Temperature in the nate change: Change of Temperature in the nate of the control of	racteristics of Acc stability -Tempution dispersion.  trumental record eclimate events e environment-Nutry and Ecosystes - Projected Impurersible Changes EES to Protocol-Interpol - UNFCCC - I	Is - Hum Melting of em - Water for s	Per profile control Per p	/ertical if the atr iods: 06 prints or iods: 06 ile-sea I ources int Regio	structure mosphere 6 n global v 6 evel rise - Human ns- Unce 6	varming- -Impacts Health - ertainties change-	CO			
Importance of atmosphere - Crates - Tempera UNIT-II Account of past Predicting futur UNIT-III Causes of Climos Climate Chaindustry, Settles In the Projected UNIT-IV Climate change Climate Sensition Environme UNIT-V	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheriature inversion-effects of inversion on polluce GLOBAL CLIMATE  I climate - Environmental indicators and instead climates - Temperature regime - Extreme IMPACTS OF CLIMATE CHANGE  Interest of Change of Temperature in the regime on various sectors - Agriculture, Forest ment and Society - Methods and Scenarios of Impacts of Climate Change - Risk of Irreviolation of Climate Change - Risk of Irreviolation of Carbon credits - Initiatives in India-Kyovity and Feedbacks - The Montreal Protocont - on a Global Scale and in India.  CLIMATE CHANGE AND MITIGATION MI	racteristics of Acc stability -Tempution dispersion.  trumental record eclimate events e environment-Nutry and Ecosystes - Projected Impurersible Changes etco Protocol-Interpol - UNFCCC - I	Melting of em - Was pacts for s	Per profile of Per profice Per p	/ertical of the atr  iods: 06 prints of  iods:	structure mosphere in global v sevel rise - Human ins- Unce in Climate anges in	varming- lmpacts Health - ertainties change- Climate	co			
Importance of atmosphere - Corates - Tempera UNIT-II Account of past Predicting futur UNIT-III Causes of Climos Climate Charled Industry, Settler In the Projected UNIT-IV Climate change Climate Sensiticand Environme UNIT-V Clean Develop Compost - Economost - Economost - Economost - International CCS) - International Intern	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheriature inversion-effects of inversion on pollucature inversion in the climate - Environmental indicators and instructed in the climates- Temperature regime - Extreme IMPACTS OF CLIMATE CHANGE in the change: Change of Temperature in the inge on various sectors - Agriculture, Forest ment and Society - Methods and Scenarios of Impacts of Climate Change - Risk of Irrevolution of Change - Risk of Irrevolution of Change - Risk of Irrevolution of Carbon credits- Initiatives in India-Kyovity and Feedbacks - The Montreal Protocomt - on a Global Scale and in India.  CLIMATE CHANGE AND MITIGATION Milliment Mechanism - Carbon Trading- example - Friendly Plastic - Alternate Energy - Iting. Key Mitigation Technologies and Practitional and Regional cooperation- Remedia	racteristics of Acc stability -Tempution dispersion.  trumental record eclimate events e environment-Nutry and Ecosystes - Projected Impurersible Changes es - Protocol-Interput - UNFCCC - I	Melting of the memory of the m	Per	/ertical if the atr iods: 06 prints or iods: 07 prints or iods: 08 pri	structure mosphere in global v sevel rise - Human ins- Unce in Climate anges in diodiesel orts in In	varming- Impacts Health - ertainties Change- Climate -Natural	co			
Importance of atmosphere - Corates - Tempera UNIT-II Account of past Predicting futur UNIT-III Causes of Climos Climate Chaindustry, Settle in the Projected UNIT-IV Climate change Climate Sensition Environme UNIT-V Clean Develop Compost - Eco Adaptation fund	Atmosphere - Physical Chemical Char Composition of the atmosphere-Atmospheriature inversion-effects of inversion on pollucature inversion in the climate - Environmental indicators and instructed in the climates- Temperature regime - Extreme IMPACTS OF CLIMATE CHANGE in the change: Change of Temperature in the inge on various sectors - Agriculture, Forest ment and Society - Methods and Scenarios of Impacts of Climate Change - Risk of Irrevolution of Change - Risk of Irrevolution of Change - Risk of Irrevolution of Carbon credits- Initiatives in India-Kyovity and Feedbacks - The Montreal Protocomt - on a Global Scale and in India.  CLIMATE CHANGE AND MITIGATION Milliment Mechanism - Carbon Trading- example - Friendly Plastic - Alternate Energy - Iting. Key Mitigation Technologies and Practitional and Regional cooperation- Remedia	racteristics of Acc stability -Tempution dispersion.  trumental record eclimate events e environment-Nutry and Ecosystes - Projected Impurersible Changes es - Protocol-Interput - UNFCCC - I	erature  s - Hum  Melting o em - Wa pacts for s  rgovern PCC -E  Clean -fuels - questraf	Per profile of profile of profile of profile of profile of profile pro	/ertical if the atr iods: 06 prints of iods: 06 iods: 06 iods: 06 cods: 06	structure mosphere in global v sevel rise - Human ins- Unce in Climate anges in diodiesel orts in In	varming- Impacts Health - ertainties Change- Climate -Natural Idia and I storage	CO			

J. David Neelin" Climate change and climate modelling" Cambridge University press (2011).
 Robin Moilveen "Fundamentals of weather and climate" Oxford University Press (2nd Edition) (2010),
 S. Dash Sushil Kumar, "Climate Change - An Indian Perspective", Cambridge University Press India Pvt. Ltd, 2007

Dr.S. SUNDARARAMAN, M. Teca., Po.L. Professor & Head Department of Civil Engg

#### Reference Books

- 1. Bill McKibben(2012), The Global Warming Reader: A Century of Writing About Climate Change, Penguin.
- 2. Jason Smerdon(2009) Climate Change: The Science of Global Warming and Our Energy Future, Columbia University
- 3. Adaptation (2006) and mitigation of climate change-Scientific Technical Analysis. Cambridge University Press, Cambridge.
- 4. J.M. Wallace and P.V. Hobbs (2006) Atmospheric Science, Elsevier / Academic Press.
- Jan C. Van Dam, (2003) Impacts of "Climate Change and Climate Variability on Hydrological Regimes", Cambridge University press

#### Web References

- lutos://nntelac.in/courses/105102089/
- 2. httos://wonv.warmheartworldwide
- 3. huns://noteLac.inkontent/storage

#### **Evaluation Method**

Assessment	Continuous	Total		
Assessment	Attendance	MCQ Test	Presentation / Activity / Assignment	Marks
Marks	10	30	60	100

Dr.S. SUNDARARAMAN, M.Tech., Ph. 2.

Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

#### **CHOSEN MANDATORY COURSES - REGULATION 2020**

U20CEM505

#### INDIAN CONSTITUTION

L T P C Hrs 2 0 0 - 30

The Constitution of India is the supreme law of India. Parliament of India cannot make any law which violates the Fundamental Rights enumerated under the Part III of the Constitution. The Parliament of India has been empowered to amend the Constitution under Article 368, however, it cannot use this power to change the "basic structure" of the constitution, which has been ruled and explained by the Supreme Court of India in its historical judgments. The Constitution of India reflects the idea of "Constitutionalism" - a modern and progressive concept historically developed by the thinkers of "liberalism" - an ideology which has been recognized as one of the most popular political ideology and result of historical struggles against arbitrary use of sovereign power by state. The historic revolutions in France, England, America and particularly European Renaissance and Reformation movement have resulted into progressive legal reforms in the form of "constitutionalism" in many countries. The Constitution of India was made by borrowing models and principles from many countries including United Kingdom and America. The Constitution of India is not only a legal document but it also reflects social, political and economic perspectives of the Indian Society. It reflects India's legacy of "diversity". It has been said that Indian constitution reflects ideals of its freedom movement, however, few critics have argued that it does not truly incorporate our own ancient legal heritage and cultural values. No law can be "static" and therefore the Constitution of India has also been amended more than one hundred times. These amendments reflect political, social and economic developments since the year 1950.

#### Course content

- 1. Meaning of the constitution law and constitutionalism
- 2. Historical perspective of the Constitution of India
- 3. Salient features and characteristics of the Constitution of India
- 4. Scheme of the fundamental rights
- 5. The scheme of the Fundamental Duties and its legal status
- 6. The Directive Principles of State Policy Its importance and implementation
- 7. Federal structure and distribution of legislative and financial powers between the Union and the States
- 8. Parliamentary Form of Government in India -The constitution powers and status of the President of India
- 9. Amendment of the Constitutional Powers and Procedure
- 10. The historical perspectives of the constitutional amendments in India
- 11. Emergency Provisions: National Emergency, President Rule, Financial Emergency
- 12. Local Self Government Constitutional Scheme in India
- 13. Scheme of the Fundamental Right to Equality

Stellangenta Villagaga Sers

- 14. Scheme of the Fundamental Right to certain Freedom under Article 19
- 15. Scope of the Right to Life and Personal Liberty under Article 21.

Dr.S. SUNDARARAMAN, M. Tech., Ph.D.,

Dr.S. SUNDARARAMAN, M.Tecal, Pol.
Professor & Head
Department of Civil Engg
Sci Manakula Vinayagar Engg. College

2. A.7.170

#### PROFESSIONAL ETHICS

L T P C Hrs 2 0 0 - 30

#### **Course Objectives**

This course should enable the students to

• To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

#### **Course Outcomes**

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

**CO** - Apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

#### **UNIT I HUMAN VALUES**

(6 Hrs)

Morals, values and Ethics – Integrity – Work ethic – Service learning – Civic virtue – Respect for others – Livingpeacefully – Caring – Sharing – Honesty – Courage – Valuing time – Cooperation – Commitment – Empathy – Self confidence – Character – Spirituality – Introduction to Yoga and meditation for professional excellence and stress management.

#### **UNIT II ENGINEERING ETHICS**

(6 Hrs)

Senses of "Engineering Ethics" — Variety of moral issues — Types of inquiry — Moral dilemmas — Moral Autonomy — Kohlberg"s theory — Gilligan"s theory — Consensus and Controversy — Models of professional roles - Theories about right action — Self-interest — Customs and Religion — Uses of Ethical Theories

#### UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION

(6 Hrs)

Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

#### UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS

(6 Hrs)

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis and Reducing Risk – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) – Discrimination

#### **UNIT V GLOBAL ISSUES**

(6 Hrs)

Multinational Corporations – Environmental Ethics – Computer Ethics – Weapons Development– Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Moral Leadership – Codeof Conduct — Corporate Social Responsibility

#### **Reference Books**

- 1. Mike W. Martin and Roland Schinzinger, "Ethics in Engineering", Tata McGraw Hill, New Delhi, 2003.
- 2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.
- 3. Charles B. Fleddermann, "Engineering Ethics", Pearson Prentice Hall, New Jersey, 2004.
- Charles E. Harris, Michael S. Pritchard and Michael J. Rabins, "Engineering Ethics –Concepts and Cases", Cengage Learning, 2009
- 5. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003
- Edmund G Seebauer and Robert L Barry, "Fundametals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001
- 7. Laura P. Hartman and Joe Desjardins, "Business Ethics: Decision Making for Personal Integrity and Social Responsibility" Mc Graw Hill education, India Pvt. Ltd., New Delhi2013.
- 8. World Community Service Centre, "Value Education", Vethathiri publications, Erode, 2011

#### **Web References**

- 1. www.onlineethics.org
- 2. www.nspe.org
- 3. www.globalethics.org
- 4. www.ethics.org

Dr.S. SUNDARARAMAN, M.Tech., Ph. ....
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2.6.7.171

#### **CHOSEN CERTIFICATE COURSES**

SI. No.	Regulation	Chosen Course
1	2023	Total Station
2	2020	STAAD Pro – V8i

OFFICIATION COLUMN	L	T	P	C	Hrs
CERTIFICATION COURSE	0	0	4		50

Students shall choose an International / Reputed organization certification course of 40 - 50 hours duration specified in the curriculum (mandatory to do a minimum of six courses) which will be offered through the Centre of Excellence. These courses shall have no credit and will not be considered for CGPA calculation.

Pass /Fail will be determined on the basis of participation, attendance, performance and completion of the course. If a candidate Fails, he/she has to repeat the course in the subsequent years. Pass in this course is mandatory for the award of degree.

Dr.S. SUNDARARAMAN, M.Tech., Pa.2...
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2.6.7.172

STORES STANFARANCE STORES

PRINCESSON & HERE

Donathment of Chell Energy

Carlos Constructions (Active Supplemental Inc.)

#### **CHOSEN ONLINE NPTEL CERTIFICATION COURSES**

Batch	List of Courses	No. of Students Registered
2023-2027	Earth Science for Civil Engineering Part I & II	26
	Cyber Security	04
2022-2026	Sustainable Engineering Concepts and Life Cycle Analysis	03
2021-2025	Geotechnical Engineering Laboratory	05

Dr.S. SUNDARARAMAN, M.Tech., Paling Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

DIS. SUNDAKARANAL, KIKE ME

Professor a Head

Concrete of Civil England of Civil Englands and Englands of College Co

# **ANNEXURE VII**



## SRI MANAKULA VINAYAGAR

ENGINEERING COLLEGE



### DEPARTMENT OF CIVIL ENGINEERING

Revised list of question paper setters and Evaluators

	Specialization	Structural Engineering			
S.No	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID	
1.	Dr. M. Uma Maguesvari	Associate Professor, Department of Civil Engineering, Rajalakshmi Engineering College, Chennai – 602105.	9443444595	umamaguesvari@gmail.	
2.	Dr.P.Revathi	Associate Professor, Department of Civil Engineering, Puducherry Technological University, Pondicherry - 605014	9487527159 9944427159	revathi@pec.edu	
3.	Dr. S. Syed Ibrahim	Assistant Professor, Department of Civil Engineering, Sree Dattha Institute of Engineering and Science, Sheriguda, Hyderabad - 501510.	8247443197	syed_ibms@yahoo.co.in	
4.	Dr. K. Rex	Professor and Head, Department of Civil Engineering, Agni College of Technology, Chennai – 600130.	9381026207	rex_lk@rediffmail.com	
5.	Dr. K. Thulasirajan	Associate Professor, Department of Civil Engineering, Annamacharya Institute of Technology, Andhra Pradesh – 516126	9486851632	kthulasirajan@gmail.co m	
6.	Dr. A. K. Kaliluthin	Associate Professor, Department of Civil Engineering, Crescent Institute of Science & Technology, Chennai - 600048	9486075577	kalil@crescent.educatio	
7.	Dr. P. V. Premalatha	Principal, Department of Civil Engineering, Oxford Engineering College, Pirattiyur, Trichy - 620009	9944579386	pvpremalatha@yahoo.c o.in	
8.	Dr. Srinivasa Rao Naraganti	Associate Professor, Department of Civil Engineering, J.B Institute of Engineering and Technology, Hyderabad, Telangana - 500075	6281776979	srininarajbiet@gmail.co m	
9.	Dr. Mohan	Professor, Department of Civil Engineering, Bharath Institute of Higher	9444642646	mohansjm@yahoo.com	

Coparion of Civil Bridge

	Specialization	Structural Engineering		
S.No	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
		Education and Research, Chennai- 600126		
10.	Dr.R.Anuradha	Professor, Department of Civil Engineering, SNS College of Technology, Coimbatore, Tamil Nadu 641035	9843263653	anuradhastalin@gmail.om
11.	Dr. N.Pannirselvam	Associate Professor, Department of Civil Engineering, SRM Institute of Science and Technology, Chennai- 603 203	9976379998	pannirsn@srmist.edu.ir
12.	Dr. P.Subashree	Assistant Professor, Department of Civil Engineering, Hindusthan College of Engineering and Technology, Coimbatore- 641050	6379559740	subasri03@gmail.com
13.	Dr.J.Rex	Associate Professor, Department of Civil Engineering, Malla Reddy Engineering College (Autonomous), Hyderabad- 500100	9994348591	rexdindigul@gmail.com
14.	Dr. T.Subbulakshmi	Assistant Professor, Department of Civil Engineering, CK College of Engineering and Technology, Cuddalore, Tamil Nadu 607003	9677443918	subbulakshmicivil88@g mail.com
15.	Dr. S.Natarajan	Associate Professor, Department of Civil Engineering, Madha Engineering College, Kundrathur, Chennai-69	9080096539	Sera.natraj1@gmail.co m
16.	Dr. S.Eswari	Associate Professor, Department of Civil Engineering, Puducherry Technological University, Pondicherry	9443560804	eswaripec@ptuniv.edu.
17.	Dr. L.K.Rex	Professor, Department of Civil Engineering Meenakshi College of Engineering, West K.K. Nagar, Chennai - 600078	9381026207	rex_lk@rediffmail.com lkrex2009@gmail.com
18.	Dr.S.Kotteeswaran	Associate Professor, Department of Civil Engineering Jaya Engineering College Tiruninarvur, Avadi	9751103627	skotteeswaranme1992 @gmail.com
19.	Dr.S.Ravichandran	Assistant Professor Civil and Structural Engineering Annamalai University	9843190545	rsravichandran5589@g mail.com

DES, SURINGRABANA G BLOWN IN

	Specialization	Structural Engineering		
S.No	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
20.	Dr. R. Senthil	Professor, Department of Civil Engineering, College of Engineering, Guindy, Anna University	7598632796	senthilr68@gmail.com
21.	Dr.M.Purushothaman	Associate Professor Department of Civil Engineering, Government College of Engineering	9443522727	emp4624@gmail.com
22.	Dr.J.Saravanan	Associate Professor Department of Civil Engineering, Government College of Engineering	9486216484	sara5468@yahoo.com

S.No	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
1.	Dr.S.Prakash Chandar	Assistant Professor, Senior Grade, Department of Civil Engineering, SRM Institute of Science and Technology, Chennai- 603 203	9962042224	prakashs@srmist.e du.in
2.	Dr. R. Venkata Krishnaiah	Professor, Department of Civil Engineering, Bharath Institute of Higher Education and Research, Chennai-600126	9840261276	venkatapec@gmail.
3.	Dr. A. Krishnamoorthy	Professor, Department of Civil Engineering, Adhiparasakthi engineering college, Melmaruvathur, Tamil Nadu- 603319	9994140410	krish_moor2006@y ahoo.com
4.	Dr.Karthikeyan	Professor, Department of Civil Engineering, Dhanalakshmi Srinivasan Engineering College, Perambalur, Tamil Nadu	9994271151	mkartik2009@gmail .com
5.	Dr. P. Suresh kumar	Professor, Department of Civil Engineering University College of Engineering, Panruti - 607 106	9487920989	erpsuresh@rediffma

Dr.S. SUNDARARAMAN, M.Tech., Ph. ....

Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. College

Madagadipet, Puducherry, India

S.No	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
1.	Dr.S.Pradeepkumar	Assistant Professor, Department of Civil Engineering, VNR Vignana Jyothi Institute of Engineering and Technology, Hyderabad.	9843672986	structuralpradeep@gmail.om
2.	Dr. B. Sri Muruganandam	Associate Professor, Department of Civil Engineering, Vellore Institute of Technology, Vellore	9791177668	bsrimuruganandam@vit.adin
3.	Dr.C.M Vivek Vardhan	Associate Professor, Department of Civil Engineering, Malla Reddy Engineering College (Autonomous), Maisammaguda, Hyderabad	9985963959	vivekvardhan2@gmail.com
4.	Dr G.Prabhakaran	Professor, Department of Civil Engineering, Siddharth institute of Engineering and Technology, Puttur, Andra Pradesh	9047088680	gprabhadhana@gmail.com
5.	Dr. G. Senthilkumar	Associate Professor, Department of Civil Engineering, Annamalai University, Annamalainagar - 608002 Tamil Nadu	9842354814	cdm.gsk@gmail.com
6.	Dr. V. Damodharan	Associate Professor, Department of Civil Engineering, Annamalai University, Annamalainagar – 608002, Tamil Nadu	9443665709	damucivil75@gmail.com
7.	Dr.R.Jayasankar	Associate Professor, AVC College of Engineering, Mannampandal, Mayiladuthurai - 609 305	9443986091	jayasankarcivil@avccengg. net
8.	Dr.S.Sudalai	Associate Professor, Centre for Pollution Control and Environmental Engineering, School of Engineering and Technology, Pondicherry University. Puducherry- 605014	9894788723	ssudalai.cpe@gmail.com

	ialization   Concrete   Name of the	Technology			
S.No	Examiner	Designation & Institution Name	Mobile No	Mail ID	
1.	Dr. R.Sakthivel	Assistant Professor, Department of Civil Engineering, Hindusthan College of Engineering and Technology, Coimbatore, Tamil Nadu - 641050	9944332228	srisakthi2010@gmail.c	
2.	Dr. S.Kandasamy	Assistant Professor, Department of Civil Engineering, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Avadi, Chennai- 600 062	8190965230	skandasamyisha@gm ail.com	
3.	Dr. V. Subathra Devi	Associate Professor, Department of Civil Engineering, Saveetha Engineering College, Chennai- 602105	9791076767	subidevi@gmail.com	

Specialization   Geotechnical Engineering				
S.No	Name of th Examiner	Designation & Institution Name	Mobile No	Mail ID
1.	Dr. P.T. Ravichandra	Professor, Department of Civil Engineering, SRM Institute of Science and Technology, Chennai- 603 203	9840798450	ptrsrm6@gmail.com
2.	Dr.N.llavaras	Assistant Professor, Department of Civil Engineering, University College of Engineering, BIT Campus, Anna University, Tiruchirappalli- 620 024	9865082422	k13071981k@gmail.co m

Name of the Examiner	Designation & Institution Name	Mobile No	. Mail ID
Dr.R.M.Narayan	Professor, Department of Civil Engineering, Dr.M.G.R Educational and Research Institute, Chennai- 600095	98843369	narayanan.rm@drmgr
an		12	du.ac.in
Dr.S.Karuppasa	Associate Professor, Department of Civil Engineering, SRM Institute of Science and Technology, Chennai-603203	97916954	karuppas@srmist.edu
my		81	in
	Dr.R.M.Narayan an Dr.S.Karuppasa	Designation & Institution Name  Professor, Department of Civil Engineering, Dr.M.G.R Educational and Research Institute, Chennai- 600095  Associate Professor, Department of Civil Engineering, SRM Institute of Science and Technology, Chennai-603203	Dr.R.M.Narayan an Dr.S.Karuppasa my  Designation & Institution Name Mobile No  Professor, Department of Civil Engineering, Dr.M.G.R Educational and Research Institute, Chennai- 600095  Associate Professor, Department of Civil Engineering, SRM Institute of Science and Technology, 81

Dr.S. SUNDARARAMAN, M.Tech., Ph.2...
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg, College Madagadipet, Puducherry, India

S.No	Name of the Examiner	Designation & Institution Name	Mobile No	Mail ID
1.	Dr. P. Sivarajan	Associate Professor, Department of Civil Engineering, Annamalai University, Annamalainagar - 608002 Tamil Nadu	9443669336	sivarajan.au@gmail.c

Specia	lization F	luid Mechanics and Machinery		
S.No	Name of	Name of the Examiner Designation & Institution Name		Mail ID
1.	Dr. Arivuma	Assistant Professor, Department of C Engineering, Dr. MGR Educational & Research Institute, Chennai- 600095	9443486831	arivu_civil@yahoo.co.

Specia	alization	Water	Resources Engineering				
S.No	Name of the		Designation & Institution Name	Mobile No	Mail ID		
1.	1. Dr. Jailakshmi Menon		Associate Professor, Department of Civil Engineering, Saveetha Engineering College, Chennai- 602105	9940066459	jailakshmiunni@gmail. com		
2.	Dr.N.Sen Kumar	thil	Assistant Professor, Department of Civil Engineering, Vellore Institute of Technology, Vellore- 632014	9003378135	n.senthilkumar@vit.ac in		

Dr.S. SUNDARARAMAIT, M.Teck., Pn.:
Professor & Head
Department of Civil Engg
Sri Manakule Vinayagar Engg. Cellege
Madagadipet, Puducherry, India

U.S. SURDAMANDAM, KIEK PL Professor & Head

Department of Clerk English Stephens of Washington College Madagas Stephens (1994)

C.v.

## **COMMON COURSE**

COMMON COURSE

## COMMON COURSES OFFERED BY CIVIL ENGINEERING

SI.No.	Course Code	Course Title
1	U23ESTC01	Basics of Civil and Mechanical Engineering

## PROFESSIONAL ELECTIVE COURSES

Profess	sional Elective –	I (Offered in Semester IV)
SI. No.	Course Code	Course Title
1	U23CEE401	Composite Structures
2	U23CEE402	Environmental Law and Policy
3	U23CEE403	Building Services
4	U23CEE404	Remote Sensing and GIS
5	U23CEE405	Alternative Building Materials and Technologies
Profess	ional Elective –	II (Offered in Semester V)
SI. No.	Course Code	Course Title
1	U23CEE506	Advanced Design of RCC Structures
2	U23CEE507	Air and Noise Pollution
3	U23CEE508	Sustainable and Lean Construction
4	U23CEE509	Airport and Harbor Engineering
5	U23CEE510	Green Building Technology
Profess	ional Elective – I	II (Offered in Semester VI)
SI. No.	Course Code	Course Title
1	U23CEE611	Advanced Structural Analysis
2	U23CEE612	Pollution Control and Monitoring
3	U23CEE613	Buildings Codes and Requirement
4	U23CEE614	Traffic engineering and Management
5	U23CEE615	Urban Planning and Development

V. In doesans

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

Dr.C. BUNDAKANAMAR, B. Sala.

Profess	sional Elective –	IV (Offered in Samester VII)
SI. No.	Course Code	Course Title
1	U23CEE716	Structural Health Monitoring
2	U23CEE717	Municipal Solid Waste Management
3	U23CEE718	Quality Control and assurance in Construction
4	U23CEE719	Tunneling Engineering
5	U23CEE720	Architecture and Town Planning
Profess	ional Elective –	V (Offered in Semester VIII)
SI. No.	Course Code	Course Title
1	U23CEE821	Precast Structures
2	U23CEE822	Industrial Waste Disposal and Treatment
3	U23CEE823	Construction Safety
4	U23CEE824	Intelligent Transport System
5	U23CEE825	Interior Design
Profess	ional Elective – '	VI (Offered in Semester VIII)
SI. No.	Course Code	Course Title
1 4	U23CEE826	Pre- Stressed Concrete Structures
2	U23CEE827	Environmental Impact Assessment
3	U23CEE828	Natural Disaster and Mitigation
4	U23CEE829	Bridge Engineering
5	U23CEE830	Smart City

1. Judanane

Dr.S. SUNDARARAMAN, M.Tech., Pn.2...
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. Cellege
Madagadipet, Puducherry, India

## **OPEN ELECTIVE COURSES OFFERED BY CIVIL ENGINEERING**

S. No	Course Code	Course Title
Open Ele	ctive – I	
1	U23CEOC01	Energy and Environment
2	U23CEOC02	Energy Efficient Buildings
Open Ele	ective – II	
1	U23CEOC03	Disaster Management
2	U23CEOC04	Air Pollution and Solid Waste Management

Dr.S. SUNDARARAMAN, M.Tech., Ph.L., Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India COPEN STATEMENT OF THE STATEMENT OF THE

Commo Tella	

Dr.S. SUNDARARANAS, M tech. Pat. Crafescon & Head Donard of Chall E 120 Sch Standard to may a firm Called Managed of Challed Called Managed of Challed Called Managed of Challed Called Called

Department	Civil /	Mechanical	c Fade	End Semester Exam Type: TE							
emester	1				ry Code: E	Credit	,,	kimum Marks			
ourse ode	U23ES	TC01	L	riods / V T	Р	C	CAM	ESE	TM		
ourse Name	Basics	of Civil and Mechanical Engineering	3		-	3	25	75   1	.00		
(Con	mon to	EEE, ECE, ICE, MECH, Civil, Mechatroni	cs Branch	es)							
Prerequisite	·	Science							•		
	On co	BT Mapping (Highest Level									
	CO1	Understand the types of buildings and	materials	). 				K2 K2			
	CO2	Classification and convoying concents									
Course	CO3	6 11.1									
Outcomes	CO4	the state of the s									
	CO5	· · · · · · · · · · · · · · · · · · ·									
	CO6										
		SECTION A -									
UNIT - I	Buildi	ings and Buildings Materials			E. 187			iods: 08			
Buildings – De cities - Green their properti	building,	<ul> <li>Classification according to NBC-plinth area</li> <li>Benefits from green building. Building Materies.</li> </ul>	a, Floor are erials - ston	ea, carpet e, brick, (	ement, cem	ent mortar, c	oncrete, st	eel, Timber -	CO1		
LINIT _ II	Build	ings Components and Surveying					L	iods: 08			
Various Buildi	ngs Comi	ponents and their functions. Foundation: fun	ction and t	ypes - Bri	ck masonry,	Stone Mason	ry and its ty	/pes – Floors,	co		
Roofs and its	types. Su	rveying: Objects – Classification – Principles	– Measure	ments of	Distances ar	nd areas – Lev	eling.				
UNIT - III		Infrastructure						iods: 07	7		
Roads and Br Quality of Wa	idges – ty ater- Dom	ypes, components advantage and disadvanta nestic sewage Treatment – Rain Water harve	ages. Railw sting – Dar	ays - Per ns - site s	manent way election for	and its eleme dam construc	ents. Sourc	es of Water - of dams.	co		
		SECTION B – MI		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							
				L ENGIN							
UNIT- IV	Inter	nal and External Combustion Systems						riods: 08	Ţ		
Steam gener	Classificat ators (Bo	nal and External Combustion Systems tion – Working principles – Diesel and Petrol ilers) – Classification – Constructional featur - Applications.	Engines: T	wo strok	e and four st	roke engines – Boiler mou	– merits ar	nd demerits.	со		
IC engines – C Steam gener Merits and d	Classificate ators (Boemerits –	tion – Working principles – Diesel and Petrol ilers) – Classification – Constructional featur - Applications. er Generation Systems, Refrigeration a	Engines: T es (of only nd Air Co.	wo strok low-pres	e and four st sure boilers) ng System	– Boiler mou	– merits ar ntings and Pe	nd demerits. accessories – riods: 07	со		
IC engines – O Steam gener Merits and d UNIT- V Power plant: Functions, A Refrigeration	Powers: Therman	tion – Working principles – Diesel and Petrol ilers) – Classification – Constructional featur - Applications. er Generation Systems, Refrigeration a al – Nuclear, Hydraulic, Solar, Wind, Geoth ns - Schemes and layouts (Description only) Conditioning System: Terminology of Refr	Engines: T es (of only  nd Air Col  ermal, Wa	wo strok low-pres nditionia ze, Tidal nd Air C	e and four st sure boilers) ng System and Ocean	— Boiler mou	merits ar ntings and Pe	riods: 07	ССС		
Steam gener. Merits and d  UNIT- V  Power plant: Functions, A Refrigeration absorption s	Powers: Therman and Air ystem – L	tion – Working principles – Diesel and Petrolilers) – Classification – Constructional feature. Applications.  er Generation Systems, Refrigeration and all – Nuclear, Hydraulic, Solar, Wind, Geothers - Schemes and layouts (Description only) Conditioning System: Terminology of Refrayout of typical domestic refrigerator – Wingusfacturing Process	Engines: T es (of only nd Air Co. ermal, Wa igeration a	wo strok low-pres nditionings se, Tidal nd Air Co plit type	e and four st sure boilers) ng System and Ocean Tonditioning.	— Boiler mou	Pegy Convers	riods: 07 sion systems - npression and			
IC engines — O Steam gener Merits and d  UNIT- V  Power plant Functions, A Refrigeration absorption s  UNIT- VI  Lathe - type	Pow s: Therms pplication and Air ystem – L Man s, Specific	tion – Working principles – Diesel and Petrolilers) – Classification – Constructional feature. Applications.  er Generation Systems, Refrigeration and – Nuclear, Hydraulic, Solar, Wind, Geothers - Schemes and layouts (Description only)  Conditioning System: Terminology of Refragout of typical domestic refrigerator – Windersters.	Engines: T es (of only nd Air Co. ermal, Wa igeration a idow and S	wo strok low-pres nditionin re, Tidal nd Air Co plit type n making	e and four st sure boilers)  ng System  and Ocean Tonditioning.  room Air con  Allowances  st description	— Boiler mou  Thermal Ener  Principle of valitioner.  , Green sand	Pe gy Convers	riods: 07 sion systems - npression and eriods: 07 and moulding,	cc		
IC engines — O Steam gener Merits and d  UNIT- V  Power plant Functions, A Refrigeration absorption s  UNIT- VI  Lathe - type	Powers: Therman and Air ystem — L  Man Man Man Man Man Man Man Man Man Ma	tion – Working principles – Diesel and Petrolilers) – Classification – Constructional feature. Applications.  er Generation Systems, Refrigeration and – Nuclear, Hydraulic, Solar, Wind, Geothers - Schemes and layouts (Description only) Conditioning System: Terminology of Refrayout of typical domestic refrigerator – Windersturing Process Cations, Operations of a centre lathe. Casting - Arc and Gas welding process, brazing a	Engines: T es (of only nd Air Co. ermal, Wa igeration a idow and S	wo strok low-pres nditionia ze, Tidal nd Air C plit type	e and four st sure boilers)  ng System  and Ocean Tonditioning.  room Air con  Allowances  st description	— Boiler mou  Thermal Ener  Principle of valitioner.  , Green sand	Pe gy Convers	riods: 07 sion systems - npression and	cc		
IC engines — O Steam gener. Merits and d UNIT- V Power plant: Functions, A Refrigeration absorption s UNIT- VI Lathe - type casting defe Lecture Per Text Books 1. Dr. S. Ja	Powers: Therman and Air ystem – L  Man St. Specificats. Weld spriods: 4	tion — Working principles — Diesel and Petrolilers) — Classification — Constructional feature. Applications.  er Generation Systems, Refrigeration and — Nuclear, Hydraulic, Solar, Wind, Geothers - Schemes and layouts (Description only) Conditioning System: Terminology of Refrayout of typical domestic refrigerator — Windigerations, Operations of a centre lathe. Casting - Arc and Gas welding process, brazing a Tutorial Periods: -	ermal, Wa igeration a idow and S ing - Patter ind solder in Prac	wo strok low-pres nditionin se, Tidal nd Air Co plit type n making ng (proces	e and four st sure boilers)  Ing System  and Ocean Tonditioning.  Froom Air conditioning.  Allowances as description and the second	— Boiler mou	Pegy Convers	riods: 07 sion systems - npression and eriods: 07 and moulding,	cc		
IC engines – O Steam gener Merits and d  UNIT- V  Power plant Functions, A Refrigeration absorption s  UNIT- VI  Lathe - type casting defe Lecture Per Text Books  1. Dr. S. Ja 2. G Shann	Powers: Therman and Air ystem – Leriods: 4 yakumar, mugam, N	tion – Working principles – Diesel and Petrol ilers) – Classification – Constructional feature - Applications.  er Generation Systems, Refrigeration a lal – Nuclear, Hydraulic, Solar, Wind, Geothers - Schemes and layouts (Description only) Conditioning System: Terminology of Refrayout of typical domestic refrigerator – Winderturing Process locations, Operations of a centre lathe. Casting - Arc and Gas welding process, brazing a Tutorial Periods: -	Engines: Tes (of only  nd Air Colermal, Waigeration and Soude: in Prace of the collections, in Engineering	wo strok low-pres nditionin se, Tidal nd Air Co plit type n making ng (proces	e and four st sure boilers)  Ing System  and Ocean Tonditioning.  Froom Air conditioning.  Allowances as description and the second	— Boiler mou	Pegy Convers	riods: 07 sion systems - npression and eriods: 07 and moulding,	cc		

Dr.S. SUNDARARAMAN, M.Tech., Ph.z.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College,
Madagadipet, Puducherry, Incila

#### **Reference Books**

- 1. M.P. Poonia, S.C. Sharma and T.R. Banga, Basic Mechanical Engineering, Khanna Publishing House 2018.
- 2. S.S.Bhavikatti, Basic Civil engineering, New Age International Itd 2018.
- 3. V. Rameshbabu, Basic Civil & Mechanical Engineering, VPC ?: blishers Private Limited, January 2017.
- 4. Serope Kalpakjian, Steven Schmid, Manufacturing Engineering and Technology, 7th Edition, Pearson Publication, 2014.
- 5. Gopi Satheesh, Basic Civil engineering, Pearson Publications, 3rd Edition, 2015.

#### **Web References**

- 1. https://nptel.ac.in/courses/112107291/
- 2. https://nptel.ac.in/courses/112/103/112103262/
- 3. https://ocw.mit.edu/courses/mechanical-engineering/2-61-internal-combustion-engines-spring-2017/ lecture-notes/
- 4. https://nptel.ac.in/courses/105102088/
- 5. https://nptel.ac.in/courses/105104101/

#### COs/POs/PSOs Mapping

COs	Program Outcomes (POs)									Program Specific Outcomes (PSOs)					
	PO1 PO2 PO	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	1	1	etUma	1	11-11-1	- 1- 1- 1	-	-	4-16		1	-		-
2	3	1	1	T-7	1		, land		1500	141	(A12 H.)	1	1133	- P	
3	3	1	1	-1-	1		1		1	-	-	1	m, and	ani-	01.71
4	3	1	-	-		-			-,	NU NI	N PANE	1			276
5	3	1		-		-		_	-		-	1		P1	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

A		Co	End Semester	Total				
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks	
Marks	5	5	5	5	5	75	100	

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.a.
Professor & Head
Department of Civil Engg
Sri Manakuta Vinayagar Engg. College
Madagadipet, Puducherry, Inches

## OPEN ELECTIVE COURSES OFFERED BY CIVIL ENGINEERING

S. No	Course Code Course Title									
Open Elective – I										
1	U23CEOC01 Energy and Environment									
2	U23CEOC02	Energy Efficient Buildings								
Open Ele	ective – II	,								
1	U23CEOC03	Disaster Management								
2	U23CEOC04	Air Pollution and Solid Waste Management								

P. Judanama\_

Professor & Head
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. CollegeManakula Vi

Department	Civil E	ingineering	Programme	e: B.Tec	h.					
Semester	VI		Course Cat	tegory C	ode: <b>OE</b>	*End	Semeste	r Exam T	vpe: TE	
Course Code	Hasor	-0004	Periods / We		Credit	Maximum Mar		Sand State of the sand of the sand		
	U23CE		L	Т	Р	С	CAM	ESE	ТМ	
Course Name	ENERG	Y AND ENVIRONMENT	3	0	0	3	25	75	100	
	7	(Common to ECE, EC	E, MECH, BME,	IT, Mecl	natronics	)			L	
Course	On completion of the course, the students will be able to									
Outcome	Apply the knowledge of science & engineering to the contemporary issues of Energy for better humankind & environment									
	CO2	Identify, review & analyze the	complex problem	ns of En	ergy crise	es in env	/ironment		<b>&lt;</b> 4	
	CO3	Designing solutions for the ene to meet the needs by understa	ergy crises in the	form of	renewak	ole energ	y systems	5   I	<b>&lt;</b> 4	
	CO4	Understanding the impact of e sustainable development.	nd provid	ling solu	tions for	P	<b>&lt;</b> 5			
	CO5	Apply biomass energy under re	elevant technolog	gies					(3	
JNIT-I	ENERO	of energy, role of energy consi			Per	iods: 09	)			
mpact of energy effect, Acid rain	on ecor	Renewable sources & Nonreney  DNMENT  nomy &environment. Regional ir  layer depletion. Indian environal incompollution), The environment protection.	mpacts of temper	rature ch	Per	iods: 09	rmina Cr			
JNIT-III	HYDRO	POWER & GEOTHERMAL E	NERGY		Peri	ods: 09			<u></u>	
ciassifications, p	nergy – oower sta	Introduction, Site selection, ation, structure and control. Georking, Advantages and disadvantages	layout of hydr	o powe	r plant	oomno	nonto 0	working, of power	CO3	
NIT-IV		& WIND ENERGY			Peri	ods: 09				
Sun as source o	of energy	- Introduction, Site selection, la	ayout of power n	lant com	nonente	8 worki	na classif	Figations	<u> </u>	
Types of collect	iors, com	ection systems efficiency, Sola power plant, components &work	r cells. Wind En	erav - Ir	ntroductio	on, adva	ntages/lin	nitations,	CO4	
NIT-V	ENERG	Y AUDIT AND MANAGEMENT	Г		Peri	ods: 09				
ntroduction, ac piomass, factors	lvantage affectin	s/limitations, Photosynthesis, g biogas generation, types of bi	biomass fuel, t iogas plant, Biom	oiomass nass pro	accifica	tion bi	ogas fron	n waste	CO5	
ecture Periods	: 45	Tutorial Periods: -	Practical Po	eriode:	_	Tel	ol De-i- '	4F		
ext Books				crious.	-	101	al Period	5:45		

- 1. Trivedi R.R. and Jalka K.R, "Energy Management", Commonwealth Publication, 20177.
- 2. Diamant R.M.E., "Total Energy", Pergamon, OxfordPublishers, 2017.
- 3. N.G. AJJANNA " Energy auditing & demand side management" first edition, Gouthami Publications, Shimoga
- 4. Chakrabarti, M.L.Soni, P.V. Gupta, U.S. Bhatnagar "Power system Engineering" 2001, DhanpatRai&Co, New Delhi.
- 5. D.P.Kothari, K.C Singal, Rajesh Ranjan, "Renewable Energy sources and Emerging Technologies" second edition, PHI, India

I fudaecama\_

Dr.S. SUNDAKARAMAN, M. Teck, Ph.S.,
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

#### Reference Books

- 1. Boyle G, Everett B and Ramett J, "Energy systems and sustainability", Oxford University Press, 2018
- 2. "Pollution Control Acts, Rules and Notifications", CPCB, Pollution Control series, PC/2/2014, Vol.I,2014
- 3. Peavy.H, Rowe.D, and Tchobanoglous, G., Environmental Engineering, Tata McGraw-Hill, 2013
- 4. S.Rao, Dr. BB Parulekar "Energy Technologies" Khanna Publications , New Delhi
- 5. David M Buchla, Thomas E Kissel, Thomas L Floyd "Renewable Energy systems" Pearson, India
- 6. Godfrey Boyle "Renewable Energy power for sustainable future" oxford Publications , New Delhi

#### Web References

- 1. https://onlinecourses.nptel.ac.in/noc20 ce23/announcements
- 2. <a href="https://swayam.gov.in/nd1">https://swayam.gov.in/nd1</a> noc20 ce23/preview
- 3. www.iucn.org
- 4. www.cites.org
- 5. www.thesummitbali.com/
- 6. http://engineering.geology.gov.in/

#### COs/POs/PSOs Mapping.

	6.70				Prog	ram O	utcom	es (PC	s)					ram Spe omes (P	
	P01	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PSO2	PSO3
CO1	1	1	2	1	2	2	1	-			-	3	3	3	3
CO2	1	1	1	15-	-	2	1	152.19				3	1	1	1
CO3	2	2	2	2	2	3	3	4. <b>-</b> T	1	1	2	3	3	3	3
CO4	2	2	2	2	3	3	3	-	1	1	2	3	3	3	3
CO5	2	2	2	2	3	3	3	-	1	1	2	3	3	3	3

#### **Evaluation Method**

		Continue	ous Assess	ment Marks (CAI	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	1	0	5	5	5	75	100

<sup>\*</sup>Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

1. Inderene

Dr.S. SUNDARARAMAN, M.Tech., Ph.:...
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

	CIVII	Engineering	Programm	e: <b>B.Te</b> c	:h.				
Semester	VI		Course Ca	tegory C	ode: Ol	E *End	Semeste	er Exam T	ype: <b>TE</b>
Course Code	LIGO	-000	Periods / We	eek		Credit	Ma	ximum Ma	arks
Course Code		EOC02	L	Т	Р	С	CAM	ESE	TM
Course Name	ENEF	RGY EFFICIENT BUILDINGS	3	0	0	3	25	75	100
	(Com	mon to EEE, ECE, MECH)	-1 -570						
Course	On co	mpletion of the course, the stu	dents will be a	ble to		(		(Hi	lapping ghest evel)
Outcome	CO1	Understand the concept and eff	ects of global w	arming		***************************************			K2
	CO2	Understand Climate system, ea	rth's atmospher	e and its	compo	nents.			K2
	CO3	Analyze the Impacts of Climate							K4
	CO4	Assess the concept about carbo				t mechan	ism		K3
	CO5	Understand climate changes, its	impact and mit	igation a	activities				<b>K2</b>
UNIT-I		DDUCTION				eriods: 09	9	<u>i</u>	
UNIT-II	ENER	GY EFFICIENCY IMPLEMENTION	ON		Pe	eriods: 09	)		
UNIT-II Energy efficienc efficient building	y policie	GY EFFICIENCY IMPLEMENTION Ses, Target setting and stakeholde ion, Passive solar, Natural ventila	r engagement, \	Various ng of bui	building			rds, Energ	15.1
Energy efficiend	y policie g operat	es, Target setting and stakeholde ion, Passive solar, Natural ventila	r engagement, \ ation, Day lightir	Various ng of bui	building Iding	codes an	d standa	rds, Energ	15.
Energy efficience efficient building UNIT-III  Data and ener Electrical Ener	ey policie g operat ENER gy effici	es, Target setting and stakeholde	r engagement, \ ation, Day lightir  NT nergy efficiency	ng of bui	building Iding Pe	codes an	d standa	efficiency.	CO2
Energy efficience efficient building UNIT-III  Data and ener Electrical Ener	ey policie g operat ENER gy effici gy Mea & Verific	es, Target setting and stakeholde ion, Passive solar, Natural ventila GY EFFICIENCY MEASUREME ency indicators, Evaluation of er surements, Thermal Energy Me	r engagement, \ ation, Day lightin  NT  nergy efficiency easurements, M	ng of bui	building Iding Pe ultiple b	codes an	d standal	efficiency.	CO2
Energy efficience efficient building  UNIT-III  Data and ener Electrical Ener Measurement a  UNIT-IV  Energy efficier	ENER  gy effici gy Mea  & Verific  ENER  ncy inve	es, Target setting and stakeholde on, Passive solar, Natural ventilal of EFFICIENCY MEASUREME ency indicators, Evaluation of ensurements, Thermal Energy Metation. Case studies.	r engagement, \ ation, Day lightin  NT hergy efficiency easurements, M	ng of bui	building Iding Pe ultiple b al & Uti	eriods: 09 enefits of elity System eriods: 09 ough pro	d standar	efficiency. urements,	CO2
Energy efficience efficient building  UNIT-III  Data and ener Electrical Ener Measurement of  UNIT-IV  Energy efficier funding, finance	ey policie g operat ENER gy effici gy Mea Verific ENER ncy inve	es, Target setting and stakeholde ion, Passive solar, Natural ventila ion, Passive surements, Thermal Energy Metation. Case studies.  GY EFFICIENCY INVESTMENT estment – through policy, through	r engagement, \ ation, Day lightin  NT  nergy efficiency easurements, M  gh project stan y markets. Cas	ng of bui	building Iding Pe ultiple b al & Uti Pe ion, threes with	codes and riods: 09 penefits of allity System or one of the riods: 09 penefits of cutting ending end	d standar f energy o em Measi curement dge of su	efficiency. urements,	CO2
Energy efficience efficient building  UNIT-III  Data and ener Electrical Ener Measurement of  UNIT-IV  Energy efficier funding, finance construction.  UNIT-V  Definition, ener costs, bench m	ENER TO SENER TO SENE	es, Target setting and stakeholde ion, Passive solar, Natural ventilal ion, Passive surements, Thermal Energy Measurements, Thermal Energy Measurements, Thermal Energy Measurements, Thermal Energy Measurements, Thermal Energy through solar instruments, through energy is a solar instruments, through energy energy performance, matching energy requirements, fuel and energy requirements.	r engagement, \ ation, Day lightin  NT hergy efficiency easurements, M  gh project stan y markets. Cas  regy managements and the project of the project stan y markets of the project of t	, The m lechanic	building Iding Pe Ultiple b al & Uti Pe ion, threes with Pe it) approent, max	eriods: 09 eriods: 09 eriods: 09 ough pro cutting ed eriods: 09 eriods: 09 eriods: 09	d standar	efficiency. urements, t, through ustainable	CO2
Energy efficience efficient building  UNIT-III  Data and ener Electrical Ener Measurement of  UNIT-IV  Energy efficier funding, finance construction.  UNIT-V  Definition, ener costs, bench moptimizing the	ENER  ENER  Gy effici  Gy Mea  Verific  ENER  Cy inverse and f  ENER  Gy audit  narking,  input en	es, Target setting and stakeholde ion, Passive solar, Natural ventilal ion, Passive surements, Thermal Energy Measurements, Thermal Energy Measurements, Thermal Energy Measurements, Thermal Energy Measurements, Thermal Energy through solar instruments, through energy is a solar instruments, through energy energy performance, matching energy requirements, fuel and energy requirements.	r engagement, \ ation, Day lightin  NT hergy efficiency easurements, M  gh project stan y markets. Cas  regy managements and the project of the project stan y markets of the project of t	dardizate se studie	building lding lding Pe ultiple bal & Uti Pe it) approant, maxgy audit	eriods: 09 enefits of fility System eriods: 09 ough pro- cutting eneriods: 09 ough pro- cutti	d standar	efficiency. urements,  t, through ustainable  ng energy ficiencies, metering,	CO2

Ana-Maria Dabija, "Energy Efficient Building Design", Springer Nature, 2020

2. Dean Hawkes and Wayne Forster, "Energy Efficient Buildings", W.W. Norton & Company, 2002

3. Amritanshu Shukla, Atul Sharma, "Sustainability Through Energy-Efficient Buildings", CRC Press, 2018.

4. Ursula Eicker, "Energy Efficient Buildings with Solar and Geothermal Resources", John Wiley & Sons, 2014.

 Jacob J. Lamb and Bruno Georges Pollet, "Energy-Smart Buildings: Design, Construction and Monitoring of Buildings for Improved Energy Efficiency", Institute of Physics Publishing, 2020

Dr.S. SUNDARARAMAN, M.Tech., Pala...
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India Pr.S. SUNDARARAMAN, a.res. ra.
Professor & Moad
Department of Civil Engo
Se Manarda Versyager Engo. Cellege
Madagedast Rosamery, resta

#### Reference Books

- Umberto Desideri, Francesco Asdrubali, "Handbook of Energy Efficiency in Buildings: A Life Cycle Approach", Butterworth-Heinemann, 2019.
- 2. Susan Roaf and Mary Hancock, "Energy Efficient Building: A Design Guide", Wiley, 1992
- Xiaoqiang Zhai and Ruzhu Wang, "Handbook of Energy Systems in Green Buildings", Springer Berlin Heidelberg, 2018
- 4. Roberto Gonzalo, "Energy-efficient architecture", Walter de Gruyter, 2012
- 5. José Manuel Andújar and Sergio Gómez Melgar, "Energy Efficiency in Buildings: Both New and Rehabilitated", MDPI, 2020

#### Web References

- 1. https://nptel.ac.in/courses/105/102/105102175/
- https://nptel.ac.in/courses/105/102/105102195/
- 3. https://alison.com/course/sustainable-architecture-energy-efficiency-and-quality

COs/POs/PSOs Mapping

Cos					Prog	gram C	Outcon	nes (Po	Os)					ecific PSOs)	
photo:	PO1	PO2	PO3	PO4	PO5	P06	P07	P08	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	1	1	3	3	3	3	3	3	3	3	3	3
CO2	2	1	1	1	1	3	3	3	3	3	3	3	3	- 3	3
CO3	2	1	1	1	1	3	3	3	3	3	3	3	3	3	3
CO4	2	1	1	1	1	3	3	3	3	3	3	3	3	3	3
CO5	2	1	1	1	1	3	3	3	3	3	3	3	3	3	3

Correlation Level: 1- Low, 2 - Medium, 3 - High

#### **Evaluation Method**

		Continue	ous Assess	ment Marks (CAI	VI)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	1	0	5	5	5	75	100

<sup>\*</sup>Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.D.,
Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. Cellege Madagadipet, Puducherry, India

Dr.S. SUNDARARAMAR, a rec. ra. Professor & Head

Department of Claff Ergg Charlette View star Engl, College, L. A. J. Walkerdolph, Fredochery Int 1979, F. A. J.

Semester	0.011	Engineering	Programm	e: <b>B.Te</b> c	h.				
0111-7-	VII		Course Ca	tegory C	ode: O	E *End \$	Semester	Exam Ty	pe: TE
0 0 1	11000		Periods / W	eek	144,1511	Credit	Ma	ximum Ma	arks
Course Code	U23CI	EOC03	L	Т	Р	С	CAM	ESE	ТМ
Course Name	DISAST	TER MANAGEMENT	3	0	0	3	25	75	100
		(Common to EEE, ECE,	CSE, IT, ICE, ME	СН, ВМЕ	E,CCE,A	AI&DS)			761
Course	On con	npletion of the course, the s	students will be a	ble to				(H	/lapping ighest evel)
Outcome	CO1	Infer Disasters, man-made	Hazards and Vulne	erabilities	3	,			K2
	CO2	Summarize the flood manag	gement studies						K2
	CO3	Identify disaster mitigation	and management	mechani	sm				K1
	CO4	Estimate the disaster safety	precaution						K2
	CO5	Determine the disaster plan	and act					••••••	K3
UNIT-I	DEFIN	ITION AND TYPES		•••••••••••••••••••••••••••••••••••••••	Po	eriods: 09	)		
UNIT-II	STUD		vaste disposal, oil	spilis, 101	,				
Earthquakes ar types and its r	nd its typ managem	Y OF IMPORTANT DISASTE es, magnitude and intensity, nent, drought types and its ) Earthquakes, Landside). So	RS seismic zones of management, land	India, ma	Pe ajor faul	eriods: 09 t systems anageme	of India	studies	of
Earthquakes ar types and its r	nd its typ managen kim (e.g.)	Y OF IMPORTANT DISASTE es, magnitude and intensity, nent, drought types and its	RS seismic zones of management, landicial Economics an	India, ma	Pe ajor faul nd its m nmenta	eriods: 09 t systems anageme	of India nts case f disaster	studies	od of CO2
Earthquakes ar types and its n disasters in Sikl UNIT-III Concepts of ris	nd its typ managem kim (e.g.) MITIGA sk mana	Y OF IMPORTANT DISASTE es, magnitude and intensity, nent, drought types and its Earthquakes, Landside). So	seismic zones of management, land cial Economics and control c	India, ma dside an d Enviro	Perajor faul dits menta	eriods: 09 t systems anageme I impact of eriods: 09	of India nts case f disaster	studies s.	co2
Earthquakes ar types and its n disasters in Sikl UNIT-III Concepts of ris	managem kim (e.g.)  MITIGA sk mana Prevention	Y OF IMPORTANT DISASTE es, magnitude and intensity, nent, drought types and its Earthquakes, Landside). So ATION AND MANAGEMENT gement and crisis management	seismic zones of management, land cial Economics and control c	India, ma dside an d Enviro	Peajor faul dist m nmenta Peat cycle	eriods: 09 t systems anageme I impact of eriods: 09	of India nts case f disaster se and R	studies s.	co2
Earthquakes are types and its not disasters in Sikle UNIT-III  Concepts of rise Development, UNIT-IV  Coping with D	managem kim (e.g.)  MITIGA sk mana Prevention  SAFE1	y OF IMPORTANT DISASTE es, magnitude and intensity, nent, drought types and its DEARTHQUAKES, Landside). So ATION AND MANAGEMENT gement and crisis management on, Mitigation and Preparedne TY PROCESS Coping Strategies; alternati	seismic zones of management, lancial Economics and ent - Disaster management - Planning for research ve adjustment pi	India, madside and Enviro	Peajor faul dits menta Peat cycle Pear Chair Chair Pear Chair Chair Pear Chair Chair Pear Chair Pea	eriods: 09 t systems nanageme impact of eriods: 09 - Respon	of India nts case f disaster se and R	studies s. Recovery -	co <sub>2</sub>
Earthquakes are types and its not disasters in Sikle UNIT-III  Concepts of rise Development, UNIT-IV  Coping with D	managem kim (e.g.)  MITIGA sk mana Prevention  SAFE1	Y OF IMPORTANT DISASTE es, magnitude and intensity, nent, drought types and its Earthquakes, Landside). So ATION AND MANAGEMENT gement and crisis management, Mitigation and Preparedness	seismic zones of management, lancial Economics and ent - Disaster management - Planning for research ve adjustment pi	India, madside and Enviro	Peajor faul dits menta Peat cycle Pear Chair Chair Pear Chair Chair Pear Chair Chair Pear Chair Pea	eriods: 09 t systems nanageme impact of eriods: 09 - Respon	of India nts case f disaster se and R	studies s. Recovery -	co <sub>2</sub>
Earthquakes are types and its not disasters in Sikle UNIT-III  Concepts of rise Development, UNIT-IV  Coping with D	md its typ managem kim (e.g.)  MITIGA sk mana Prevention  SAFET Disaster:	y OF IMPORTANT DISASTE es, magnitude and intensity, nent, drought types and its DEARTHQUAKES, Landside). So ATION AND MANAGEMENT gement and crisis management on, Mitigation and Preparedne TY PROCESS Coping Strategies; alternati	seismic zones of management, landicial Economics and ent - Disaster management - Disaste	India, madside and Enviro	Peajor faul dits menta Peat cycle Pear Challia and dits and dits menta Pear Challia and dits menta Pear Challia and dispersions pear Pear Chal	eriods: 09 t systems nanageme impact of eriods: 09 - Respon eriods: 09 anging Co	of India nts case f disaster se and R concepts	studies s. Recovery -	CO2
Earthquakes are types and its redisasters in Sikle UNIT-III Concepts of rist Development, UNIT-IV Coping with Demanagement - I UNIT-V Planning for disagreduction plan -	managem kim (e.g.)  MITIGA sk mana Prevention  SAFET bisaster: Industrial  PLANN aster man Disaster	Y OF IMPORTANT DISASTE es, magnitude and intensity, nent, drought types and its Earthquakes, Landside). So ATION AND MANAGEMENT gement and crisis management on, Mitigation and Preparedne TY PROCESS Coping Strategies; alternati Safety Plan; Safety norms an	seismic zones of management, land cial Economics and ent - Disaster management produced by a distribution of the control of th	India, madside and Enviro	Peajor faul its monmenta Peat cycle Pear - Chalia and december 1 - Steps	eriods: 09 t systems anageme impact of eriods: 09 - Respon eriods: 09 anging Co disaster m eriods: 09	of India nts case f disaster se and R oncepts anagement	studies s.  Recovery -  of disasteent	CO3

- Dr. Mrinalini Pandey, Disaster Management, Wiley India Pvt. Ltd
- 2. Tushar Bhattacharya, Disaster Science and Management, McGraw Hill Education (India) Pvt. Ltd.
- 3. Jagbir Singh, Disaster Management : Future Challenges and Opportunities, K W Publishers Pvt. Ltd.
- 4. J. P. Singhal, Disaster Management, Laxmi Publications
- 5. C. K. Rajan, Navale Pandharinath, Earth and Atmospheric Disaster Management : Nature and Manmade, B S Publication

Department of mon Kengg vienarule vinayayar Eneg. Lolley avadagazisar Pakicram, Inte

Dr.S. SUNDARARAMAN, M. Tech., Ph. ... Professor & Head

**Department of Civil Engg** Sri Manakula Vinayagar Engg. College & . A . 7 . 194 Madagadipet, Puducherry, India

#### Reference Books

- 1. Disaster Management by Mrinalini Pandey Wiley 2014.
- 2. Disaster Science and Management by T. Bhattacharya, McGraw Hill Education (India) Pvt Ltd Wiley 2015
- 3. Earth and Atmospheric Disasters Management, N. Pandharinath, CK Rajan, BS Publications 2009.
- 4. National Disaster Management Plan, Ministry of Home affairs, Government of India
- 5. Manual on Disaster Management, National Disaster Management, Agency Govt of India.

#### Web References

- 1. http://www.ndma.gov.in/images/policyplan/dmplan/draftndmp.pdf
- 2. http://nidm.gov.in/pdf/guidelines/new/sdmp.pdf
- 3. http://sdmassam.nic.in/pdf/publication/undp/disaster\_management\_in\_india.pdf

COs/POs/PSOs Mapping

					Prog	ram O	utcom	es (PC	s)	1.44				ram Spe omes (P	
,	PO1	PO2	PO3	P04	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	3	3	2	-	2	2	2	3	1	3	3
CO2	3	2	3	2	3	3	2	-	2	2	2	3	1.	3	3
CO3	3	2	3	2	3	3	2	-	2	2	2	3	. 1	3	3
CO4	3	2	- 3	2	3	3	2	- 1	2	2	2	3	9111 g	3	3
CO5	3	2	3	2	3	3	2		2	2	2	3	saltin d	3	3

Correlation Level: 1-Low, 2-Medium, 3- High

#### **Evaluation Method**

		Continuo	us Assess	ment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	1	0	5	5	5	75	100

<sup>\*</sup>Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.L.. Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

Department	Civil	Engineering	Programm	e: B.Tec	h.		- 1		
Semester	VII		Course Ca	tegory C	ode: <b>OE</b>	*End	Semeste	r Exam Ty	pe: <b>TE</b>
	1		Periods / W	eek		Credit	Max	imum Mar	ks
Course Code	U23C	EOC04	L	Т	Р	С	CAM	ESE	ТМ
Course Name		DLLUTION AND SOLID WASTE GEMENT	3	0	0	3	25	75	100
		(Common to EEE, ECE, CSE,	, IT, ICE, MEC	CH, BME	, CCE, A	I&DS)			.1
Course	On cor	npletion of the course, the stude	Allen i Italia (Secondaria)					BT Ma (Hig Lev	hest
Outcome	CO1	Understand the type, sources &	effect of air po	ollutants				K	2
	CO2	Know the parameters affecting a and estimation of pollutants	air pollution a	nd variou	ıs metho	ds of me	easuremer	nt K	3
	CO3	Gain knowledge of basics of nois	se pollution					K	2
	CO4	Understand various air pollution automobile exhaust	control equipi	ment's &	pollution	caused	due to	K	4
	CO5	Understand the concepts of solid	l waste mana	gement				K	2
UNIT-I	DEFIN	IITION AND TYPES			Per	iods: 09	)		
pollutants, effe  UNIT-II	1500 - 14	pollutants on man, plants animal & Y OF IMPORTANT DISASTERS	k materials		Per	iods: 09	)		CO1
Meteorological particulates an	Aspects: d gaseou	Atmospheric stability, plume beha s pollutants, methods of estimation	avior, Ambient n.	air samı	pling and	stack sa	ampling, c	ollection of	CO2
UNIT-III	MITIG	ATION AND MANAGEMENT		•	Per	iods: 09	)		A.,
gravity settlers	, electros	thods and equipment: Principle o static precipitators, bag filters cycles, s, exhaust treatment and abateme	ones, wet scr	ubbers,	automobi	ile exhai	ust: Pollut	ion due to	CO3
UNIT-IV	SAFE	TY PROCESS			Per	iods: 09	)		1
Introduction to sampling and a	solid was ınalysis, I	ste management, sources, quantifi Method of collection.	cation and ch	aracteris	ation, cla	ssificatio	on and co	mponents,	CO4
UNIT-V	PLAN	NING AND ACT			Per	iods: 09	)		L
Equipment use Treatment and eachate mana	disposal	ollection and transportation, transmethods: composting, sanitary lan	sfer stations, idfills, Incinera	solid wation – co	aste pro	cessing	and mai	nagement. plications,	CO5
Lecture Period	ls: 45	Tutorial Periods: -	Practical	Periods:	-	То	tal Period	ds:45	<u></u>
ovt Books			L			L			

#### **Text Books**

- 1. M.N. Rao & H.V.N. Rao, 1988, Air Pollution, Tata McGraw Hill Publishing Co. Ltd.
- 2. C.S. RAO, 2007, Environmental Pollution Control Engineering, New Age International, Wiley Estern Ltd. New Delhi.
- 3. Stern A. C., 1973, Air pollution, Academic Press.
- 4. A.D. Bhide & Sunderesan B.B., 1983, Solid Waste Management in Developing countries, INSDOC, New Delhi.
- Tohobanoglous, 1993, Intgrated Solid Waste Management Engineering Principle and Management Issues, McGraw-Hill publication Ltd.

Dr.S. SUNDARARAMAN, M. Tech., Ph.L. Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College 2 . A . 7 . 196
Madagadipet, Puducherry, India

Sri Manakula disapagan Esgg. Nokaga Madajadipot, Podocherty, Ireka

#### Reference Books

- 1. P. Aarne Vesilind, William Worrell & Debra Reinhart, 2002, Solid Waste Engineering, Cengage Learning India pvt. Ltd.
- 2. Dr. Y Anjaneyulu, 2002, Air Pollution and Control Technologies, Allied Publisher pvt. Ltd.
- 3. Waste Management: A Reference Handbook. Contributors: Jacqueline Vaughn Author. Publisher: ABC-Clio
- 4. K. V. S. G. Murlikrishna, 1995, Air Pollution, Kaushal& Company.

#### Web References

- 1. https://nptel.ac.in/courses/120108005/
- 2. http://cpheeo.gov.in/upload/uploadfiles/files/Part1
- 3. https://nptel.ac.in/content/storage2/courses/104103022

#### COs/POs/PSOs Mapping

COs		1		1 5	Prog	ram O	utcom	es (PC	Os)					ram Spo omes (F	
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	3	2	3	3	3	3	3	2	3	3	2	3
CO2	3	3	2	3	3	3	3	2	3	2	2	3	3	3	3
CO3	3	3	3	2	2	2	3	3	3	3	2	3	3	3	2
CO4	2	3	2	3	2	3	2	3	3	2	2	3	3	3	3
CO5	3	3	3	2	3	3	3	3	3	2	3	3	3	3	3

Correlation Level: 1- Low, 2 - Medium, 3 - High

#### **Evaluation Method**

Pagine	3474075	Continue	ous Assess	ment Marks (CAI	VI)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	1	0	5	5	5	75	100

<sup>\*</sup>Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

P. Indoesama

Dr.S. SUNDARARAMAN, M.Tech, Ph.J... Professor & Heard

Department of Civil Enga Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

2. A. 7.197

Course Code   U23HSOC05	Department	MBA			Pro	gramme	e: B. Te	ch				
Course Name   MARKETING MANAGEMENT   3 0 0 3 25 75   100	Semester	V/VI	- 1111		Course Category Code: *End Semester ExTE  Periods/Week Credit Max Ma  L T P C CAM							
Course Name   MARKETING MANAGEMENT   3   0   0   3   25   75   100	Course Code					Per	iods/W	eek	Credit	23/23/2006		1
Prerequisite  On completion of the course, the students will be able to  Explain the importance of marketing and differentiate between marketing and selling.  COURSE  Outcomes  CO2  Apply the consumer decision-making process and differentiate between industrial and consumer buying behavior.  Explain the importance of marketing and differentiate between marketing and selling.  CO3  Apply the consumer decision-making process and differentiate between industrial and consumer buying behavior.  Explain the role of distribution channels and design an effective channel distribution strategy for both consumer and industrial goods.  CO3  Analyze emerging trends in marketing, including Customer Relationship Management and experiential marketing and Selling - Marketing Environment actors, Importance of the Arketing - Introduction to Marketing  Marketing - Importance of Marketing - Difference between Marketing and Selling - Marketing Environment actors, Importance of environment analysis - Strategic Marketing planning; Introduction, Need, Framework of Strategic planning process and Steps in strategic planning planning; Introduction, Need, Framework of Strategic planning process and Steps in strategic planning planning; Introduction, Need, Framework of Strategic planning process and Steps in strategic planning planning; Introduction, Need, Framework of Strategic planning process and Steps in strategic planning planning; Introduction, Need, Framework of Strategic planning process and Steps in strategic planning planning; Introduction of organizational markets, Characteristics, Difference between Industrial and Consumer buying planning. Product Life cycle - Categories of New product, Importance and Steps in New Product Development - Packaging; Need for packaging, Essential qualities of packaging, kinds of packaging and advantages of packaging - Labelling; Functions, Types of labelling, advantages and disavortages of packaging - Product Life cycle - Categories of New Product, Importance and Steps in New Product Development - P		U23H	SOC05			L	Т	Р				
Prerequisite  On completion of the course, the students will be able to  Caurse Course Course Course Coutcomes  Course Course Coutcomes  Course Course Course Course Coutcomes  Course Course Coutcomes  Course Cour	Course Name	MARI	KETING I	MANAGEMENT		3	0	0	3	25	75	100
On completion of the course, the students will be able to    Course   Cours				Common	to ALL I	Branche	es					
On completion of the course, the students will be able to  Explain the importance of marketing and differentiate between marketing and selling.  Course Outcomes  Outcomes  Coas  Examine product life cycle management strategies and demonstrate the steps involved in new product development.  Coas  Examine product life cycle management strategies and demonstrate the steps involved in new product development.  Coas  Examine product development.  Coas  Examine product life cycle management strategies and demonstrate the steps involved in new product development.  Coas  Examine product dire cycle management strategies and demonstrate the steps involved in new product development.  Coas  Examine product distribution channels and design an effective channel distribution strategy for both consumer and industrial goods.  Analyze emerging trends in marketing, including Customer Relationship Management and experiential marketing, including Customer Relationship Management and experiential marketing, including Customer Relationship Management and experiential marketing strategies.  Periods: 9  Marketing - Importance of Marketing - Difference between Marketing and Selling - Marketing Environment:  The Macro and Micro Environment factors, Importance of environment analysis - Strategic Marketing planning; Incroduction, Need, Framework of Strategic planning process and Steps in strategic Marketing UNIT-II  Consumer Behaviour and Marketing Strategy  Periods: 9  Periods: 9  Periods: 9  Periods: 9  Perioduct and Pricing Mix  Periods: 9  Product classification of organizational markets, Characteristics, Difference between Industrial and Consumer buying planeling; Purcious and Steps in New Product Development - Packaging; Need for packaging, Essential gualities of packaging, kinds of packaging and advantages of packaging - Labelling; Functions, Types of labelling - Pricing objectives - Pricing strategies  UNIT-IV  Place and Promotion Mix  Periods: 9  Product classifications - Promotion Mix  Periods: 9  Product classifications - Chan	Prerequisite											T
Course Outcomes  Coa Apply the consumer decision-making process and differentiate between industrial and consumer buying behavior.  Coa Examine product life cycle management strategies and demonstrate the steps involved in new product development.  Coa Illustrate the role of distribution channels and design an effective channel distribution strategy for both consumer and industrial goods.  Cob Analyze emerging trends in marketing, including Customer Relationship Management and experiential marketing strategies.  UNIT-I Introduction to Marketing  Introduction to Marketing  Marketing - Importance of Marketing - Difference between Marketing and Selling - Marketing Environment: The Macro and Micro Environment factors, Importance of environment analysis — Strategic Marketing planning: Introduction, Need, Framework of Strategic planning process and Steps in strategic planning - Ethical and Social Responsibility of Marketing - 4 Ps of Marketing  UNIT-II Consumer Behaviour and Marketing Strategy  Periods: 9  Coa Market Segmentation - Needs, Classification and Significance — Targeting, Positioning and Competitive Strategies.  UNIT-III Product and Pricing Mix  Product classifications - Product Life cycle - Strategies for managing Product Life cycle — Categories of New product, Importance and Steps in New Product Development — Packaging: Need for packaging, Essential qualities of packaging, kinds of packaging and advantages of packaging - Labelling: Functions, Types of labelling, advantages and disadvantages of labelling — Pricing objectives — Pricing strategies  UNIT-IV Place and Promotion Mix Periods: 9  Coa Marketing — Periods: 9  Coa		On co							nt shies		Map (Hig Le	ping hest
Course Outcomes    Cos   Examine product life cycle management strategies and demonstrate the steps   Examine product life cycle management strategies and demonstrate the steps   Involved in new product development.		CO1	selling.									(2
CO3   Involved in new product development.   Co4   Illustrate the role of distribution channels and design an effective channel distribution strategy for both consumer and industrial goods.   Co5   Analyze emerging trends in marketing, including Customer Relationship Management and experiential marketing strategies.   Periods: 9	Course	CO2	industria	I and consumer buyir	ng behav	ior.						(3
CO4   distribution strategy for both consumer and industrial goods.   CO5   Analyze emerging trends in marketing, including Customer Relationship   Management and experiential marketing strategies.   Periods: 9	Outcomes	CO3	involved	in new product devel	lopment.							(3
UNIT-I Introduction to Marketing Marketing - Importance of Marketing - Difference between Marketing and Selling - Marketing Environment: The Macro and Micro Environment factors, Importance of environment analysis — Strategic Marketing planning: Introduction, Need, Framework of Strategic planning process and Steps in strategic planning - Ethical and Social Responsibility of Marketing - 4 Ps of Marketing UNIT-II Consumer Behaviour and Marketing Strategy Periods: 9 Role of buyer - Types of Buying behavior - Factors influencing buying decisions - Consumer decision making process: Meaning and Steps in Consumer decision making Process — Organizational buying behaviour: Consumer decision of organizational markets, Characteristics, Difference between Industrial and Consumer buying - Market Segmentation - Needs, Classification and Significance — Targeting, Positioning and Competitive Strategies.  UNIT-III Product and Pricing Mix Periods: 9  Product classifications - Product Life cycle - Strategies for managing Product Life cycle - Categories of New product, Importance and Steps in New Product Development — Packaging: Need for packaging, Essential qualities of packaging, kinds of packaging and advantages of packaging — Labelling: Functions, Types of labelling, advantages and disadvantages of labelling — Pricing objectives — Pricing strategies  UNIT-IV Place and Promotion Mix Periods: 9  Distribution Channel and Physical distribution: Meaning and Importance of distribution channel - Channel design decisions — Channels of distribution for consumer and industrial goods — Physical Distribution		CO4	distribut	on strategy for both o	consume	and inc	dustrial (	goods.				(3
Marketing - Importance of Marketing - Difference between Marketing and Selling - Marketing Environment: The Macro and Micro Environment factors, Importance of environment analysis — Strategic Marketing planning: Introduction, Need, Framework of Strategic planning process and Steps in strategic planning - Ethical and Social Responsibility of Marketing - 4 Ps of Marketing  UNIT-II Consumer Behaviour and Marketing Strategy  Role of buyer - Types of Buying behavior - Factors influencing buying decisions - Consumer decision making process: Meaning and Steps in Consumer decision making Process — Organizational buying behaviour: Classification of organizational markets, Characteristics, Difference between Industrial and Consumer buying - Market Segmentation - Needs, Classification and Significance — Targeting, Positioning and Competitive Strategies.  UNIT-III Product and Pricing Mix  Periods: 9  Product classifications - Product Life cycle - Strategies for managing Product Life cycle — Categories of New product, Importance and Steps in New Product Development — Packaging: Need for packaging, Essential qualities of packaging, kinds of packaging and advantages of packaging — Labelling: Functions, Types of labelling, advantages and disadvantages of labelling — Pricing objectives — Pricing strategies  UNIT-IV Place and Promotion Mix Periods: 9  Distribution Channel and Physical distribution: Meaning and Importance of distribution channel - Channel design decisions — Channels of distribution for consumer and industrial goods — Physical Distribution: Meaning, Objectives and components of physical distribution — Promotion: Objectives, Types of sales promotion: Consumer, Salesperson and Dealer sales promotion — Introduction to Integrated Marketing  Communication  UNIT-V Trends in Marketing — Customer Relationship Management: Definition, features, Types and importance - Experiential Marketing: Meaning, strategies and benefits - Mobile Marketing: Definition and types of mobile marketing — Digital Marketing: Meaning, types of di			Manage	ment and experientia	ın marke Il marketi	eting, ir ng strate	egies.	Cusic			<u>'</u>	<b>&lt;</b> 4
The Macro and Micro Environment factors, Importance of environment analysis — Strategic Malketing planning: Introduction, Need, Framework of Strategic planning process and Steps in strategic planning - Ethical and Social Responsibility of Marketing - 4 Ps of Marketing  UNIT-II Consumer Behaviour and Marketing Strategy Periods: 9  Role of buyer - Types of Buying behavior - Factors influencing buying decisions - Consumer decision making process: Meaning and Steps in Consumer decision making Process — Organizational buying behaviour: Classification of organizational markets, Characteristics, Difference between Industrial and Consumer buying - Market Segmentation - Needs, Classification and Significance — Targeting, Positioning and Competitive Strategies.  UNIT-III Product and Pricing Mix Periods: 9  Product classifications - Product Life cycle - Strategies for managing Product Life cycle — Categories of New product, Importance and Steps in New Product Development — Packaging: Need for packaging, Essential qualities of packaging, kinds of packaging and advantages of packaging — Labelling: Functions, Types of labelling, advantages and disadvantages of labelling — Pricing objectives — Pricing strategies  UNIT-IV Place and Promotion Mix Periods: 9  Distribution Channel and Physical distribution: Meaning and Importance of distribution channel - Channel design decisions — Channels of distribution: Meaning and Importance of Definition of Integrated Marketing  Communication Periods: 9  Emerging trends in Marketing — Customer Relationship Management: Definition, features, Types and importance — Experiential Marketing: Meaning, strategies and benefits - Mobile Marketing: Definition and types of mobile marketing — Digital Marketing: Meaning, types of digital marketing — Inbound marketing: Meaning, importance, metrices of marketing analytics — An overview of Sustainable Marketing	UNIT-I	Intro	duction t	o Marketing			1.0-	III N			mont:	
Role of buyer - Types of Buying behaviour - Factors influencing buying decisions - Consumer decision making process: Meaning and Steps in Consumer decision making Process - Organizational buying behaviour: Classification of organizational markets, Characteristics, Difference between Industrial and Consumer buying - Market Segmentation - Needs, Classification and Significance - Targeting, Positioning and Competitive Strategies.  UNIT-III Product and Pricing Mix Periods: 9  Product classifications - Product Life cycle - Strategies for managing Product Life cycle - Categories of New product, Importance and Steps in New Product Development - Packaging; Need for packaging, Essential qualities of packaging, kinds of packaging and advantages of packaging - Labelling: Functions, Types of labelling, advantages and disadvantages of labelling - Pricing objectives - Pricing strategies  UNIT-IV Place and Promotion Mix Periods: 9  Distribution Channel and Physical distribution: Meaning and Importance of distribution channel - Channel design decisions - Channels of distribution for consumer and industrial goods - Physical Distribution: Meaning, Objectives and components of physical distribution - Promotion: Objectives, Types of sales promotion: Consumer, Salesperson and Dealer sales promotion - Introduction to Integrated Marketing Communication  UNIT-V Trends in Marketing  Emerging trends in Marketing - Customer Relationship Management: Definition, features, Types and importance - Experiential Marketing: Meaning, strategies and benefits - Mobile Marketing: Definition and types of mobile marketing - Digital Marketing: Meaning, types of digital marketing - Inbound marketing: Meaning, importance, metrices of marketing analytics - An overview of Sustainable Marketing  Table Priods: 9	The Macro ar	nd Micro duction,	Environi Need, Fr	ment factors, Importa camework of Strategi	ance of c plannir	environ ng proce	ment a	naiysis	- Strate	gic iviair	keting	CO1
process: Meaning and Steps in Consumer decision making Process – Organizational buying benaviour.  Classification of organizational markets, Characteristics, Difference between Industrial and Consumer buying - Market Segmentation - Needs, Classification and Significance – Targeting, Positioning and Competitive Strategies.  UNIT-III  Product and Pricing Mix  Product classifications - Product Life cycle - Strategies for managing Product Life cycle – Categories of New product, Importance and Steps in New Product Development – Packaging: Need for packaging, Essential qualities of packaging, kinds of packaging and advantages of packaging – Labelling: Functions, Types of labelling, advantages and disadvantages of labelling – Pricing objectives – Pricing strategies  UNIT-IV  Place and Promotion Mix  Periods: 9  Distribution Channel and Physical distribution: Meaning and Importance of distribution channel - Channel design decisions – Channels of distribution for consumer and industrial goods – Physical Distribution: Meaning, Objectives and components of physical distribution – Promotion: Objectives, Types of sales promotion: Consumer, Salesperson and Dealer sales promotion – Introduction to Integrated Marketing  Communication  UNIT-V  Trends in Marketing  Emerging trends in Marketing: Meaning, strategies and benefits - Mobile Marketing: Definition and types of mobile marketing - Digital Marketing: Meaning, types of digital marketing - Inbound marketing: Meaning, fundamentals and difference between inbound and outbound marketing - Marketing Analytics: Meaning, importance, metrices of marketing analytics – An overview of Sustainable Marketing	LIMIT_II	Cons	sumer Be	haviour and Market	ing Strat	tegy						
Product classifications - Product Life cycle - Strategies for managing Product Life cycle - Categories of New product, Importance and Steps in New Product Development - Packaging: Need for packaging, Essential qualities of packaging, kinds of packaging and advantages of packaging - Labelling: Functions, Types of labelling, advantages and disadvantages of labelling - Pricing objectives - Pricing strategies  UNIT-IV Place and Promotion Mix Periods: 9  Distribution Channel and Physical distribution: Meaning and Importance of distribution channel - Channel design decisions - Channels of distribution for consumer and industrial goods - Physical Distribution: Meaning, Objectives and components of physical distribution - Promotion: Objectives, Types of sales promotion: Consumer, Salesperson and Dealer sales promotion - Introduction to Integrated Marketing Communication  UNIT-V Trends in Marketing  Emerging trends in Marketing: Meaning, strategies and benefits - Mobile Marketing: Definition and types of mobile marketing - Digital Marketing: Meaning, types of digital marketing - Inbound marketing: Meaning, fundamentals and difference between inbound and outbound marketing - Marketing Analytics: Meaning, importance, metrices of marketing analytics - An overview of Sustainable Marketing	process: Mear Classification of Market Segr	ning and	Steps in	n Consumer decisior narkets. Characteristi	n making cs, Differ	Proces	ss – Or etween l	ganızat ndustri	al and Co	ing beni nsumer	aviour. buying	CO2
Product classifications - Product Life cycle - Strategies for managing Product Life cycle - Categories of New product, Importance and Steps in New Product Development - Packaging: Need for packaging, Essential qualities of packaging, kinds of packaging and advantages of packaging - Labelling: Functions, Types of labelling, advantages and disadvantages of labelling - Pricing objectives - Pricing strategies    Note		Droc	luct and	Pricing Mix					Perio	ds: 9		
Distribution Channel and Physical distribution: Meaning and Importance of distribution channel - Channel design decisions - Channels of distribution for consumer and industrial goods - Physical Distribution: Meaning, Objectives and components of physical distribution - Promotion: Objectives, Types of sales promotion: Consumer, Salesperson and Dealer sales promotion - Introduction to Integrated Marketing Communication  UNIT-V  Trends in Marketing  Periods: 9  Emerging trends in Marketing - Customer Relationship Management: Definition, features, Types and importance - Experiential Marketing: Meaning, strategies and benefits - Mobile Marketing: Definition and types of mobile marketing - Digital Marketing: Meaning, types of digital marketing - Inbound marketing: Meaning, fundamentals and difference between inbound and outbound marketing - Marketing Analytics: Meaning, importance, metrices of marketing analytics - An overview of Sustainable Marketing	Product classiful product, Important product, Important product produc	fications rtance and	- Product nd Steps kinds of	Life cycle - Strategie in New Product Dev packaging and adva	velopmer antages	nt – Pac of pack	:kagıng: aging –	Need Labelli	tor раска ng: Funct	ging, ⊏s	senual	COS
Distribution Channel and Physical distribution: Meaning and Importance of distribution channel - Channel design decisions - Channels of distribution for consumer and industrial goods - Physical Distribution: Meaning, Objectives and components of physical distribution - Promotion: Objectives, Types of sales promotion: Consumer, Salesperson and Dealer sales promotion - Introduction to Integrated Marketing Communication  UNIT-V  Trends in Marketing  Periods: 9  Emerging trends in Marketing: Meaning, strategies and benefits - Mobile Marketing: Definition and types of mobile marketing - Digital Marketing: Meaning, types of digital marketing - Inbound marketing: Meaning, fundamentals and difference between inbound and outbound marketing - Marketing Analytics: Meaning, importance, metrices of marketing analytics - An overview of Sustainable Marketing	LINIT-IV	Plac	e and Pro	omotion Mix					Perio			
Emerging trends in Marketing - Customer Relationship Management: Definition, features, Types and importance - Experiential Marketing: Meaning, strategies and benefits - Mobile Marketing: Definition and types of mobile marketing - Digital Marketing: Meaning, types of digital marketing - Inbound marketing: Meaning, fundamentals and difference between inbound and outbound marketing - Marketing Analytics: Meaning, importance, metrices of marketing analytics - An overview of Sustainable Marketing	Distribution Cl design decision Meaning, Obj promotion: Co	hannel a ons – C ectives onsumer	and Physichannels	cal distribution: Mea of distribution for co ponents of physical	onsumer I distribu	and in tion - I	idustrial Promoti	goods on: Ob	oution cha - Physi jectives,	annel - 0 cal Dist Types 0	ribution of sale	s CO4
Emerging trends in Marketing - Customer Relationship Management: Definition, features, Types and importance - Experiential Marketing: Meaning, strategies and benefits - Mobile Marketing: Definition and types of mobile marketing - Digital Marketing: Meaning, types of digital marketing - Inbound marketing: Meaning, fundamentals and difference between inbound and outbound marketing - Marketing Analytics: Meaning, importance, metrices of marketing analytics - An overview of Sustainable Marketing	HNIT-V	Tren	ds in Ma	rketing								
	Emerging tree importance - E of mobile mar fundamentals	nds in Experient keting -	Marketing ial Marke Digital M ference	i - Customer Relatiting: Meaning, strated arketing: Meaning, ty between inbound and	gies and ypes of o d outbou	benefits ligital m ınd mar	s - Mobil arketing rketing	e Mark j – Inbo - Mark	eting: Def ound marl	inition ai keting: N	na type Neaning	S, CO
			marketii		P	ractical	Period	s:		Total P	eriods	45

1. Indaecana\_

Dr.S. SUNDARARAMAM, M. Fech., Ph.L...
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2.A.7.198

#### **Text Books**

- 1. Keller, Philip and Kevin Lane Kotler "Marketing Management" 16th Edition, Pearson Education Limited, 2022.
- 2. V.S.Ramaswamy, S.Namakumari, 6th Edition, Sage Publications India Pvt Ltd, 2018

#### Reference Books

- Prachi Gupta, Ashita Aggarwal, et al. "Marketing Management: Indian Cases" Pearson Education Limited, 2024
- 2. Arunkumar, Meenakshi.N, "Marketing Management" 3rd Edition, Vikas Publishing House, 2016
- 3. Rajan Saxena, "Marketing Management" 5th Edition, MacGraw Hill Publications, 2017

#### Web References

- 1. https://www.ama.org/
- 2. https://www.marketingprofs.com/
- 3. https://indianjournalofmarketing.com/
- 4. http://www.publishingindia.com/ijamm/
- 5. https://onlinecourses.swayam2.ac.in/imb20 mg36/preview

#### \*TE-Theory Exam, LE-Lab Exam

#### COs/POs/PSOs Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		ram Sp omes (I	
(COs)					124	1174				war it			PSO1	PSO2	PSO3
CO 1	1	2	Lr <u>2</u> 11	7.4	-	2	1	1	17-5	2	1	1	3	2	1
CO 2	1	2	1	-	1	2	1	2		2	1	1	3	2	1
CO 3	1	2	3	-	1	2	1	2	-5	2	1	1	3	2	1
CO 4	1	1	3	_	2	1	2	1	1	2	2	1	3	2	1
CO 5	1	3	2	2	2	3	2	2	1	2	2	3	3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

		Conti	nuous Assessr	nent Marks (CA	.M)	End Semester	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus`

Dr.S. SUNDARARAMAN, M.Tach., Ph.D.
Professor & Head
Department of Civil Engg
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2.0.7.199

Department	MBA					B. Tecl					
Semester	V/VI			Cours OE	1.	gory Co			mester Ex		
Sauras Codo			The later than the later		Perio	ods/Wee		Credit			
Course Code	U23H	SOC02				Т	Р	С	CAM	ESE	TM
Course Name	NEW	PRODUCT	DEVELOPMENT	167 17 19 3		0	0	3	25	75	100
			Commo	on to ALL Br	anche	s	u mala				
rerequisite											
riedrald at	On co		f the course, the st				1000				ipping hest vel)
	CO1	business of									(2
Course	CO2	specification	ket research to ident ons.								(3
Outcome s	соз	the most v	he product concepts iable option.							K	(3
	CO4	design for	product prototype that manufacturing.								(3
	CO5	Analyze a product.	business plan and	market strate	egy for	the suc	cessfu				(4
UNIT-I	Intro	duction to	New Product Devel	opment					Periods: 9	9	
Consideration	ns in NF	oducts - R PD	isk Management in	New Produ	ct Dev	velopme	nt - Sı	ıstainabi	NPD - Bus lity and E	Ellicai	CO1
Consideration UNIT-II Identifying Ma Customer Ne Analysis and	Market O eeds into	et Researc	h and Customer New for New Products Specifications - Estab NPD - Tools for Under	eds - Conducting and F	g Mar	ket Res	search	for NPE	Periods:	9 lating	CO2
Consideration UNIT-II  Identifying Ma Customer Ne Analysis and and Ethnogra	Market O eeds into Benchmaphy	oducts - R PD  et Researc  pportunities o Product S marking in N	h and Customer Net for New Products Specifications - Estab NPD - Tools for Unde	eds - Conducting and Ferstanding Conducting	g Mar	ket Res	search	for NPE sifications Surveys,	Periods:	9 lating etitive oups,	
Consideration UNIT-II Identifying Ma Customer Ne Analysis and and Ethnogra UNIT-III Concept Gene	Market O eeds into Benchraphy Cond	et Researce  pportunities o Product S marking in N  cept Genera	h and Customer Ne	eds  - Conductinolishing and Ferstanding Conducting Cond	g Mar Refining onsum	ket Res g Produ er Beha	search ct Spec viour: S	for NPE difications Surveys,	Periods:  O - Trans S - Compe Focus Gr  Periods:  Ind Brainsto	9 lating etitive oups,  9 orming tion of	CO2
Consideration UNIT-II Identifying Ma Customer Ne Analysis and and Ethnogra UNIT-III Concept Gene Solutions - D Concepts - S Techniques	Market O eeds into Benchraphy Concertation Feesign T	et Researce  pportunities o Product S marking in N  cept Genera  Process: Co hinking for g and Scori	h and Customer New for New Products Specifications - Established For Under the Artion and Evaluation and Externation and Exter	eds  - Conductinolishing and Ferstanding Conducting Cond	g Mar Refining onsum	ket Res g Produ er Beha	search ct Spec viour: S	for NPE difications Surveys,	Periods:  O - Trans S - Compe Focus Gr  Periods:  Ind Brainsto	9 lating etitive oups, 9 orming etition of otyping	CO2
Consideration UNIT-II Identifying Ma Customer Ne Analysis and and Ethnogra UNIT-III Concept Gene Solutions - D Concepts - S Techniques UNIT-IV Product Archi Environmenta Collaboration	Market Oeeds into Benchmaphy Concertation Force Producted In Considered	et Researce  pportunities o Product S marking in N  cept Genera  Process: Co hinking for g and Scori  uct Design  and its role derations -	h and Customer New Froducts Specifications - Established For I was ation and Evaluation and Evaluation and Evaluation and Evaluation and Evaluation and Products - Technic Product Concepts and Development in NPD - Modular vis Organizing Productional Teams in Produc	eds - Conducting Conducting Idea Source Concept Est. Integral Proceedings of the Development of the Developm	g Mar Refining ces - C oncept valuati	ket Res g Produ er Beha larifying Genera ion and	search ct Spec viour: S the Pro ation - S Selection	for NPE cifications Surveys, oblem ar Systemate on Methological	Periods:  Periods: Periods:  Periods:  Periods:  Periods:  Periods:  Periods:  Periods:	9 lating etitive oups, 9 porming tion of otyping 9 ability - ment -	CO2
Consideration UNIT-II Identifying Ma Customer Ne Analysis and and Ethnogra UNIT-III Concept Gene Solutions - D Concepts - S Techniques UNIT-IV Product Archi Environmenta Collaboration Product Deve	Market Opeds into Benchmaphy Concertation Forceenin Prod tecture Il Considered Considere	et Researci pportunities o Product S marking in N eept Genera Process: Co hinking for g and Scori uct Design and its role derations - oss - Functi t Methodolo	h and Customer New For New Products Specifications - Established For New Products on the Indiana and Evaluation and Evaluation and Externing Products - Technical Product Concepts and Development in NPD - Modular visonal Teams in Productional	eds - Conducting and Ferstanding Conducting and Ferstanding Conducting Conduc	g Mar Refining ces - C oncept valuati	ket Res g Produ er Beha larifying Genera ion and	search ct Spec viour: S the Pro ation - S Selection	for NPE cifications Surveys, oblem ar Systemate on Methological	Periods:  Periods: Periods:  Periods:  Periods:  Periods:  Periods:  Periods:  Periods:	9 lating etitive oups, 9 porming tion of otyping 9 ability - ment Agile	CO2
Consideration UNIT-II Identifying Ma Customer Ne Analysis and and Ethnogra UNIT-III Concept Gene Solutions - D Concepts - S Techniques UNIT-IV Product Archi Environmenta Collaboration Product Deve UNIT-V Developing a	Market Opens in NF  Production Force in Consideration Force in Consi	et Researci pportunities o Product S marking in N eept Genera Process: Co hinking for g and Scori uct Design and its role iderations - ioss - Functi t Methodolo inch, Strateg Product Str	h and Customer New Froducts Specifications - Established Froducts - Tools for Understand Action and Evaluation and Evaluation and Evaluation and Evaluation and Evaluation and Products - Technical Product Concepts - Modular via Organizing Productional Teams in Prod	eds - Conducting and Ferstanding Conduction al Idea Source for Concept Education arket Demand For Market Demand For Mark	g Mar Refining ensum ces - C oncept valuati oduct / ent Tea ent - T	ket Res g Produ er Beha larifying Generation and Architectams - Stools for	search ct Spec viour: \$  the Pro ation - \$ Selection  ture - E Stages Effective  Strateg st - Lau	for NPE cifications on Methodor feam we Produce item for nch Eva	Periods:  Periods: Periods: Periods: Periods: Periods: Periods: Periods: Periods: Periods: Periods: Periods:	9 lating etitive oups,  9 porming tion of otyping  9 ability - ment - Agile  9 ducts - Product	CO2
Consideration  JNIT-II  dentifying Ma Customer Ne Analysis and and Ethnogra  UNIT-III  Concept Gene Solutions - D Concepts - S Techniques  UNIT-IV  Product Archi Environmenta Collaboration Product Deve  UNIT-V  Developing a	Market Opeds into Benchmaphy Concertation Force Production Force In Consider And Cropment In New Force In	et Researci pportunities o Product S marking in N eept Genera Process: Co hinking for g and Scori uct Design and its role iderations - oss - Functi t Methodolo ich, Strateg Product Str Product Bus ous Improve	h and Customer New Froducts Specifications - Established Froducts - Technique Products - Technique Product Concepts - MPD - Modular vs Organizing Product Organizing Product Grand Teams in Products - Technique Products - Technique Product Concepts - Modular vs Organizing Product Organization Product Organizat	eds - Conducting and Ferstanding Conduction al Idea Source for Concept Education arket Demand For Market Demand For Mark	g Mar Refining ensum ces - C oncept valuati oduct / ent Tea ent - T	ket Res g Produ er Beha larifying Generation and Architectams - Stools for	search ct Spec viour: \$  the Pro ation - \$ Selection  ture - E Stages Effective  Strateg st - Lau	for NPE cifications on Methodor feam we Produce item for nch Eva	Periods:  New Proc	9 lating etitive oups,  9 porming tion of otyping  9 ability - ment - Agile  9 ducts - Product	CO2
Consideration  JNIT-II  dentifying Ma Customer Ne Analysis and and Ethnogra  UNIT-III  Concept Gene Solutions - D Concepts - S Techniques  UNIT-IV  Product Archi Environmenta Collaboration Product Deve  UNIT-V  Developing a Developing a Life Cycle - C  Lecture Perio	Market Opeds into Benchmaphy Concertation Force Production Force Productio	et Researci pportunities o Product S marking in N eept Genera Process: Co hinking for g and Scori uct Design and its role iderations - oss - Functi t Methodolo nch, Strateg Product Str Product Bus ous Improve	for New Products specifications - Established attomand Evaluation and Evaluation and Externing Products - Technical Product Concepts and Development in NPD - Modular via Organizing Product onal Teams in Productional Team	eds - Conductinolishing and Ferstanding Conductinolishing and Ferstanding Conductinolishing and Ferstanding Conduct Source Concept Education Education Education Education Enhancement Conduct Enhancement Conduction Conductio	g Mar Refining ces - C oncept valuati oduct / ent Tea ent - T	ket Res g Produ er Beha larifying Generation and Architectams - State ools for	search ct Spec viour: S  the Pro ation - S Selection  ture - D Stages Effective  Strateg st - Lau  riods:	for NPE cifications Surveys,  bblem ar Systemate on Method  Design for of team we Produ  lies for nch Eva	Periods:	9 lating etitive oups,  9 porming tion of otyping  9 ability - ment - Agile  9 ducts - Product	CO2
Consideration  JNIT-II  dentifying Ma Customer Ne Analysis and and Ethnogra  JNIT-III  Concept Gene Solutions - D Concepts - S Techniques  UNIT-IV  Product Archi Environmenta Collaboration Product Deve  UNIT-V  Developing a Developing a Life Cycle - O Lecture Perion  Text Books  1 Ulrich K	Market Opens in NF  Market Opens in NF  Benchmaphy  Conception Formation For	et Researci pportunities o Product S marking in N eept Genera Process: Co hinking for g and Scori  uct Design and its role derations - oss - Functi t Methodolo nch, Strateg Product Str Product Bus ous Improve	h and Customer New Froducts Specifications - Established Froducts - Tools for Under International Externation and Evaluation and Evaluation and Evaluation and Evaluation and Externation Products - Technical Product Concepts - Modular via Organizing Productional Teams in Productional Teams Productional Periods:	eds - Conducting and Ferstanding Conductions and Ferstanding Conductions at Idea Source and Idea Source and Ferstanding For Concept Education arket Dewelopment Technologies and For Market Dewelopment Technologies and For Market Dewelopment Technologies and Ferstanding For Market Dewelopment Technologies and Ferstanding For Market Dewelopment Technologies and Ferstanding For Market Demarket Demarket Dewelopment Technologies and Ferstanding For Market Dewelopment Technologies and Ferstanding For Market Demarket Demarket Demarket Demarket Dewelopment Technologies and Ferstanding For Market Demarket Dem	g Mar Refining consum- ces - Concept valuation oduct / ent Tea ent - T	ket Res g Produ er Beha  larifying Genera ion and  Architec ams - S ools for  I Entry ch - Pos ts tical Pe	search ct Spec viour: \$  the Pro ation - \$ Selection  Strateges Effectiv  Strateges t - Lau  riods:	for NPE cifications Surveys, oblem are Systemate on Methodo of team are Productive Produ	Periods:	9 lating etitive oups,  9 prining ation of otyping  9 ability - ment - Agile  9 ducts - Product	CO2
Consideration  JNIT-II  dentifying Ma Customer Ne Analysis and and Ethnogra  JNIT-III  Concept Gene Solutions - D Concepts - S Techniques  UNIT-IV  Product Archi Environmenta Collaboration Product Deve  UNIT-V  Developing a Developing a Life Cycle - G Lecture Perio Text Books  1. Ulrich K	Market Operation Force In Consider A Secondary In Consider A Secondary In Continue In Cont	et Researci pportunities o Product S marking in N  cept General Process: Co hinking for g and Scori  uct Design and its role derations - coss - Functi t Methodolo nch, Strateg Product Str Product Bus ous Improve	isk Management in h and Customer New for New Products Specifications - Estab NPD - Tools for Under Ation and Evaluation Intinuous and Externing New Products - Technic Product Concepts  and Development in NPD - Modular via Organizing Product onal Teams in Product gies  gy and Commerciali rategy - Building Mationess Plan - Preparitement and Future Pro-	eds - Conducting of the conduction of the conduc	g Mar Refining consum- ces - Concept valuation oduct / ent Tea ent - T	ket Res g Produ er Beha larifying Generation and Architectams - Stools for I Entry ch - Posts tical Pe	search ct Spec viour: S  the Pro ation - S Selection  Strateg Strateg st - Lau  riods:  raw-Hill	for NPE cifications Gurveys, oblem are Systemate on Methodologies for nch Evaluated Total	Periods:  O - Trans S - Compe Focus Gri  Periods:  Ind Brainste Ind Exploration  Periods:  Trans  Tr	9 lating etitive oups,  9 prining ation of otyping  9 ability - ment - Agile  9 ducts - Product  445	CO2

1. Indecenama\_

Dr.S. SUNDARARAMAN, M.Tech., Pa.S...
Professor & Head

Department of Civil Engg

Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2.A.7.200

#### Reference Books

- Trott, P. Innovation management and new product development 6th edition. Pearson Education. 2017
- Thomke, S. Experimentation works: The surprising power of business experiments. Harvard Business Review Press. 2020
- Blank, S. G., & Dorf, B. The startup owner's manual: The step-by-step guide for building a great company. Wiley. 2020
- 4. Brown, T. Change by design: How design thinking transforms organizations and inspires innovation. Harper Business. 2009
- Kelley, T., & Littman, J. The ten faces of innovation: IDEO's strategies for beating the devil's advocate and driving creativity throughout your organization. Currency/Doubleday. 2006.

#### Web References

- https://conjointly.com/kb/
- https://www.entrepreneur.com/article/281999
- https://www.mindtools.com/pages/article/newSTR\_66.htm
- https://www.interaction-design.org/literature/article/design-thinking-getting-started-with-empathy 4.
- https://www.productplan.com/glossary/product-architecture/
- https://hbr.org/2019/09/why-design-thinking-works
- https://www.smartsheet.com/new-product-development.
- https://www.ptc.com/en/blogs/cad/best-practices-for-developing-new-products

#### \*TE-Theory Exam, LE-Lab Exam

#### COs/POs/PSOs Mapping

Course	DO4	DO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12		ram Spe omes (P	ecific SOs)
Outcomes (COs)	PO1	PO2	PU3	PU4	FO3	100	107	1 00		T Table	2000		PSO1	PSO2	PSO3
CO1	3	-	3	-	3	1	1	-	-	1	10-00	2	3	2	1
CO2	1	7	2	1	3	-	1-1	1	-	1		3	3	2	1
CO3	1	1	3	-	2		1	4-3	2		1	2	3	2	1
CO4	3	-1	1	1	3	1	_	1	2	-	1	1	3	2	1
CO5	1	-	3	-	3	-	-	-	2	-	1	2	3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### Evaluation Methods

		Con	tinuous Ass	sessment Marks (	CAM)	End Semester	Total
Assessment	CAT 1	CAT	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

1. Judamana Dr.S. SUNDARARAMAN, M.Tech., Ph. 2...

Professor & Head Department of Civil Engg Sri Manakule Vinayagar Engg. Cellege Managadinet, Puducherry, India

2. A.7. 201

	BADA		Programme					Typ	o TE
epartment emester	MBA V/VI		Course Cate	egory Co	de:	*End Sen			
			Per	riods/Wee	ek	Credit		um Mark	
ourse Code	U23HS	OC04	L	T	Р	C 3	25	75	100
ourse Name	ECON	OMICS FOR ENGINEERS	3	0	0	3	25		
			to ALL Branch	es				Trail-	
rerequisite	_	s of Economics  mpletion of the course, the stud	dents will be ab	le to				BT Ma (High Lev	nest
	On co	Interpret principles of manageri	ial economics to	o real-we	orld sc	enarios, ι	utilizing	K	
	CO1	demand analysis and forecasting  Discuss production functions a	tochniques					К	2
Course	CO2	managerial decision-making and Examine various market struct	markat strateout						
outcome	CO3	l L L - i en and c	SOMPATITIVE OVIIZ	ITTICS.					.3
	CO4	Apply macroeconomic policies	and their im	plications					(3
	CO5	Analyze recent economic tren income inequality.	ids, such as te	echnologi	ical ad				(4
JNIT-I	Intro	duction to Managerial Economi	ics		1.11		Periods	: 9	
Analysis: Law Comparative Effective Fore	statistic	es: Meaning, Scope, and Importa- mand, Elasticity of Demand, Law s: Shift of a curve and movemen - Qualitative Methods - Quantitati uction Function and Cost Conc	t along with the ve Methods.	curve - I	Deman	d Forecas	Periods	s: 9	
Analysis: Law Comparative Effective Fore UNIT-II	statistics ecasting Prod	s: Shift of a curve and movement - Qualitative Methods - Quantitati - Qualitative Methods - Quantitati - Quantitative Methods - Quantitati - Quantitative Methods - Quantitative Method	t along with the ve Methods.  cepts  Managerial De	cision Ma	aking -	Law of va	Periods	s: 9 roportion	6 603
Analysis: Law Comparative Effective Fore UNIT-II  Production I and law of re	ecasting  Prod  Function  Sturns to  otal, avei	s: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Revenue Meaning, Types, Applications in scale - ISO Quants - Producer Stage and marginal cost - Revenue	t along with the ve Methods.  cepts  Managerial De	cision Ma	aking -	Law of va	Periods riable processed Rever	roportion ot: Types	6 603
Analysis: Law Comparative Effective Fore UNIT-II  Production I and law of re of Costs - To and Average	Prod Function eturns to otal, aver	s: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Revenue - Rev	t along with the ve Methods.  septs  Managerial Desurplus: Price ce e Concepts: Total	curve - I	aking - price flue (TR)	Law of va	Periods riable price to concept al Rever	roportion of: Types hue (MR)	CO2
Analysis: Law Comparative Effective Fore  UNIT-II  Production I and law of re of Costs - To and Average  UNIT-III	Prod Function eturns to otal, avei Revenu	s: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Revenue - ISO Quants - Producer Strage and marginal cost - Revenue - ISO Quants	t along with the ve Methods.  cepts  Managerial Descriptus: Price ce e Concepts: Total	cision Mailing and al Revenu	aking - price flue (TR)	Law of va	Periods riable priods t concept Rever Period Duopoly	roportion ot: Types nue (MR) s: 9 - Pricing	CO2
Analysis: Law Comparative Effective Fore  UNIT-II  Production I and law of re of Costs - To and Average  UNIT-III  Market stru policies: Co Geographic	Prod Function Start average Revenu Mar Start Base Cal Pricin	rand, Elasticity of Definitin, particity of Definitin, particity of Definitin, participants and Scale - Quantitative Methods - Quantitative Methods - Quantitative Methods - Replications in scale - ISO Quants - Producer Scale and marginal cost - Revenue (AR).  Refect Structure  Perfect Competition, Monopoly, Modernicing, Demand - Based Pricing, Dynamic Pricing, Bundle Pricing, Dynamic Pricing, Bundle Pricing, Dynamic Pricing, Bundle Pricing	t along with the ve Methods.  cepts  Managerial Descriptus: Price ce e Concepts: Total	cision Mailing and al Revenu	aking - price flue (TR)	Law of va	Periods riable priods t concept Rever Period Duopoly	roportion ot: Types nue (MR) s: 9 - Pricing	CO2
Analysis: Law Comparative Effective Fore  UNIT-II  Production I and law of re of Costs - To and Average  UNIT-III  Market stru policies: Co Geographic  UNIT-IV  Globalization	Prod Function Start average Revenu Mar Start Base Cal Pricin Mac n and E	rand, Elasticity of Definition, as: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Meaning, Types, Applications in scale - ISO Quants - Producer Strage and marginal cost - Revenue (AR).  Rete Structure  Perfect Competition, Monopoly, Modericing, Demand - Based Pricing, Dynamic Pricing, Bundle Pricing, Dynamic Pricing, Bundle Pricing Croeconomics	t along with the ve Methods.  septs  Managerial Descriptus: Price ce e Concepts: Total  Monopolistic Concepts, Competition, Competition, Price Discrim	cision Mailing and al Revenumpetition, in -, Base ination, F	Demano aking - price fl ue (TR) Oligoped Prici Premiur	Law of va oor - Cos - Margina ooly and I	Periods riable pit concept al Rever  Period Duopoly nological and prace pational	roportion t: Types nue (MR) - Pricing I Pricing tices. ds: 9 income	G CO2
Analysis: Law Comparative Effective Fore  UNIT-II  Production I and law of re of Costs - To and Average  UNIT-III  Market stru policies: Co Geographic  UNIT-IV  Globalization circular flow its types - F	Productions to tall, averaged and Pricing Market Process and Pricing Market Prici	rand, Elasticity of Definition, as: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Methods - Revenue and Meaning, Types, Applications in scale - ISO Quants - Producer Strage and marginal cost - Revenue are (AR).  Rete Structure  Perfect Competition, Monopoly, Method Pricing, Demand - Based Pricing, Dynamic Pricing, Bundle Pricing Croeconomics  Economic Policies - National Income - Monetary policy and Fiscal Direct Investment (FDI) - Foreign	t along with the ve Methods.  septs  n Managerial Descriptus: Price ce e Concepts: Total  Monopolistic Concing, Competitiong, Price Discriment, Policy - Busines Institutional Inventored	cision Mailing and al Revenumpetition, an -, Base ination, F	Oligoped Prici Premiur	Law of va oor - Cos - Margina ooly and E ing, Psych m Pricing a easuring r	Period  Period  Period  Duopoly nologica and prac  Period  Period  Period  Period  Period  Period  Period	roportion t: Types nue (MR)  - Pricing tices. Is: 9 income lation an	co2
Analysis: Law Comparative Effective Fore  UNIT-II  Production I and law of re of Costs - To and Average  UNIT-III  Market stru policies: Co Geographic  UNIT-IV  Globalization circular flov its types - F  UNIT-V	Prod Function Statistics Secasting Prod Function Sturns to Stal, aver Revenu Mar Statistics Mar Sturns to Stal, aver Stal	rand, Elasticity of Definition, as: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Methods - Republications in scale - ISO Quants - Producer Strage and marginal cost - Revenue (AR).  Reference Competition, Monopoly, Methods of Pricing, Demand - Based Pricing, Dynamic Pricing, Bundle Pricing, Dynamic Pricing, Bundle Pricing Croeconomics  Iconomic Policies - National Income - Monetary policy and Fiscal Direct Investment (FDI) - Foreign Cent Trends in Economics  E-commerce, Fintech, and Online	t along with the ve Methods.  septs  Managerial Descriptus: Price ce e Concepts: Total  Monopolistic Company, Competition, Competition, Price Discrimental Price Discrimental Investitutional	cision Mailing and al Revenumpetition, For a Base ination, For a Cycles is the control of the co	Demandaking - price flue (TR)  Oligoped Price Premiur  s of mes concer FII).	Law of va oor - Cos - Margina ooly and E ing, Psycl m Pricing a easuring r pts - Inflat	Period Duopoly nologica and prace Period Period Period Duopoly nologica and prace Period prace Period Duopoly nologica and prace period prace period	roportion ot: Types nue (MR) s: 9 - Pricing otices. ds: 9 income lation an ds: 9 , Artifici	co2
Analysis: Law Comparative Effective Fore  UNIT-II  Production I and law of re of Costs - To and Average  UNIT-III  Market stru policies: Co Geographic  UNIT-IV  Globalization circular flow its types - F  UNIT-V  Digital Econ Intelligence Work - Impa	Productions to tall, averaged and August on G	rand, Elasticity of Definition, as: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Methods - Revenue and Meaning, Types, Applications in scale - ISO Quants - Producer Strage and marginal cost - Revenue are (AR).  Rete Structure  Perfect Competition, Monopoly, Method Pricing, Demand - Based Pricing, Dynamic Pricing, Bundle Pricing Croeconomics  Economic Policies - National Income - Monetary policy and Fiscal Direct Investment (FDI) - Foreign Croeconomics  Entert Trends in Economics  E-commerce, Fintech, and Onlice tomation in Economic Decision-Note of the Pricing Croeconomics - Income In - equal to the Pricing Croeconomics - Inco	t along with the ve Methods.  septs  n Managerial Descriptus: Price ce e Concepts: Total  Monopolistic Concing, Competitiong, Price Discrim  ome Concepts: Policy - Busines Institutional Inventational Inventational Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational Inventational Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational Inventational Concepts: Policy - Grand Concepts: Policy - Grand Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational Concepts: Policy - Grand Concepts:	cision Mailing and al Revenumpetition, in -, Base ination, Function of the control of the contro	Oligoped Prici Premiur Growth	Law of va oor - Cos - Margina ooly and E ing, Psych m Pricing a easuring r pts - Inflat	Period Duopoly nologica and prace Period Period Period Duopoly nologica and prace Period prace Period Duopoly nologica and prace period prace period	roportion ot: Types nue (MR) - Pricing trices. I Pricing trices. ds: 9 income lation an ds: 9 , Artifici	co2
Analysis: Law Comparative Effective Fore UNIT-II  Production I and law of re of Costs - To and Average UNIT-III  Market stru policies: Co Geographic UNIT-IV  Globalization circular flov its types - F UNIT-V  Digital Econ Intelligence Work - Impa	Productions to tall, averaged and Auract on Griods: 4	s: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Methods - Revenue of the Company	t along with the ve Methods.  septs  n Managerial Descriptus: Price ce e Concepts: Total  Monopolistic Concing, Competitiong, Price Discrim  ome Concepts: Policy - Busines Institutional Inventational Inventational Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational Inventational Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational Inventational Concepts: Policy - Grand Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational	curve - I cision Ma iling and al Revenu npetition, n -, Base ination, F  Methods ss Cycles sstment (I Role of conomy: Effects, a	Aking - price flue (TR)  Oligoped Price Premiur  Gorowth and Soc  Periods	Law of va oor - Cos ooly and E ing, Psycl m Pricing a easuring r pts - Inflat ology : B of Freela io - politic s: Tot	Period Duopoly nologica and prace Period Period Duopoly nologica and prace Period prace period prace period al period al period al period	roportion of: Types nue (MR) s: 9 - Pricing offices. ds: 9 income lation and ds: 9 , Artificing offices. ds: 45	co2
Analysis: Law Comparative Effective Fore UNIT-II  Production I and law of re of Costs - To and Average UNIT-III  Market stru policies: Co Geographic UNIT-IV  Globalization circular flov its types - F UNIT-V  Digital Econ Intelligence Work - Impa	Productions to tall, averaged and Auract on Griods: 4	s: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Methods - Revenue of the Company	t along with the ve Methods.  septs  n Managerial Descriptus: Price ce e Concepts: Total  Monopolistic Concing, Competitiong, Price Discrim  ome Concepts: Policy - Busines Institutional Inventational Inventational Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational Inventational Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational Inventational Concepts: Policy - Grand Concepts: Policy - Grand Concepts: Policy - Busines Institutional Inventational	curve - I cision Ma iling and al Revenu npetition, n -, Base ination, F  Methods ss Cycles sstment (I Role of conomy: Effects, a	Aking - price flue (TR)  Oligoped Price Premiur  Gorowth and Soc  Periods	Law of va oor - Cos ooly and E ing, Psycl m Pricing a easuring r pts - Inflat ology : B of Freela io - politic s: Tot	Period Duopoly nologica and prace Period Period Duopoly nologica and prace Period prace period prace period al period al period al period al period	roportion of: Types nue (MR) s: 9 - Pricing offices. ds: 9 income lation and ds: 9 , Artificing offices. ds: 45	co2
Analysis: Law Comparative Effective Fore  UNIT-II  Production I and law of re of Costs - To and Average  UNIT-III  Market stru policies: Co Geographic  UNIT-IV  Globalization circular flow its types - F  UNIT-V  Digital Econ Intelligence Work - Impa Lecture Pe Text Books  1. Sar edir	Prod Function Eturns to Stal, aver Revenu  Mar  Icture: Prost-Base cal Pricir  Mac  Mac  In and Example Prod  Rec  In and Au  In and	rand, Elasticity of Definition, as: Shift of a curve and movement - Qualitative Methods - Quantitative Methods - Quantitative Methods - Quantitative Methods - Revenue and Meaning, Types, Applications in scale - ISO Quants - Producer Strage and marginal cost - Revenue are (AR).  Rete Structure  Perfect Competition, Monopoly, Method Pricing, Demand - Based Pricing, Dynamic Pricing, Bundle Pricing Croeconomics  Economic Policies - National Income - Monetary policy and Fiscal Direct Investment (FDI) - Foreign Croeconomics  Entert Trends in Economics  E-commerce, Fintech, and Onlice tomation in Economic Decision-Note of the Pricing Croeconomics - Income In - equal to the Pricing Croeconomics - Inco	t along with the ve Methods.  septs  I Managerial Descriptus: Price ce concepts: Total  Monopolistic Combing, Competition, Competition, Price Discriment, Policy - Business Institutional Investing - Gig Eccurality : Causes, Formula in Prices - Managerial Express - The edition.	cision Mailing and al Revenumpetition, in -, Base ination, Faction Methods is Cycles in a	Oligoped Priciperential Conception (TR)  Oligoped Priciperential Conception (Technology)  Technology  Technology	Law of va oor - Cos - Margina ooly and E ing, Psych m Pricing a easuring r pts - Inflat ology : B of Freela io - politic s: Tota	Period Duopoly nologica and prace Period Period Duopoly nologica and prace Period prace period prace period al period al period al period al period	roportion of: Types nue (MR) s: 9 - Pricing offices. ds: 9 income lation and ds: 9 , Artificing offices. ds: 45	cO2

Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadipet, Puducherry, India

#### Reference Books

- 1. Varian, Hal R. Intermediate Microeconomics: A Modern Approach, 9th edition., W.W. Norton & Company, 2014.
- 2. Brickley, James A., Smith Jr., Clifford W., and Zimmerman, Jerold L. Managerial Economics and Organizational Architecture, 7<sup>th</sup> edition., McGraw-Hill Education, 2016.
- 3. Samuelson, Paul, and Nordhaus, William. Economics, 20th edition., McGraw-Hill Education, 2019.
- 4. Schiff, Peter, and Schotter, Andrew J. Introduction to Microeconomics, 3rd edition., Cengage Learning, 2012.
- 5. Moore, James C. Economic Theory and Operations Analysis, 2<sup>nd</sup> edition., Academic Press, 1970.

#### Web References

- 1. https://www.jaroeducation.com/blog/nature-and-types-of-managerial-economics/
- 2. https://psu.pb.unizin.org/introductiontomicroeconomics/chapter/chapter-6-costs-and-production/
- 3. https://corporatefinanceinstitute.com/resources/economics/market-structure.
- 4. https://www.britannica.com/money/macroeconomics
- 5. https://www2.deloitte.com/us/en/insights/economy/global-economic-outlook/weekly-update.html

#### \*TE-Theory Exam, LE-Lab Exam

COs/POs/PSOs Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	Prog Outc	ram Spe omes (F	ecific (SOs)
(COs)			- 13		241113	1, 1, 154			LL EP LE				PSO1	PSO2	PSO3
CO1	1	1	1		1	1	1		10-20	2	2		3	2	1
CO2	1	1	1.	2	2	2	2			3	3	3	3	2	1
CO3	11	1	1	2	- 1-19	2	2			3	-	3	3	2	1
CO4	1	1		2	2	2	2	2		3	3	3	3	2	1
CO5	1	1	1	2	2		2	2		3	3	3	3	2	. 1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

		Conti	nuous Assessr	nent Marks (CA	.M)	End Semester	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

1. Indawanan

Dr. Schill DARARAMAN, M. Tech., Ph. 2
Professor & Head
Department of Civil Engg
Shi Manakula Vinayagar Engg. College
Madagadipet, Puducherry, India

2.4.7.203

Department		Programme	: B.Te	ch				
Semester	V/VI	Course Cat OE			nd Sen	nester Ex	cam Ty	oe: TI
Course Cod	e U23HSOC01	F	Periods/\			tMaximu		(S
Course Nam		L	T	Р	С	CAM	ESE	TN
Course Maii		3	0	0	3	25	75	100
Prerequisite		ALL Branch	es					
Tarangala	On completion of the course, the students	s will be able t	to				BT Ma (High	hest
	CO1 Describe the Concept and Importance	of Intellectual P	roperty	Rights (IPI	₹).		K	
Course	CO2 Describe the procedures for patent reg infringement.	istration, includ	ling reco	ognizing le	gal rem		К	
Outcomes	CO3 Apply copyright laws to hypothetical plagiarism.						- '	3
	CO4 Infer the different types of trademark infringement issues.						K	4
	CO5 Explain the legalities surrounding indus	strial designs,	geograp	hical indica	ations, a	and their	К	2
UNIT-I-	Overview of Intellectual Property				Pe	riods: 9		
Specification	Law of Patents  d Nature of Patent - Subject matter of Panventions - Process and product Patent, Land Claims - Granting of Patents - Transfer ong of Patents	egal Requirer	nente fo	r Patente	Patenta	nt door	mant.	CO2
JNIT-III	Law of Copyrights				Pe	riods: 9		
A i								
Remedies -	Nature of Copyright - Subject matter of copyregistration Procedure, Assignment and Lice Emerging new trends in Copyrights - Reland Intellectual Theft - Copyrights with special results.	nsing of copy ated Rights: (	right - Celebritv	Infringeme	nt of C	onyrights	bac s	CO3
JNIT-IV	Law of Trademarks	METER.			Pe	riods: 9		
rademarks Bround - Ass	d Nature of Trademarks - Different kinds - Registration of Trademarks - Grounds for r signment and Licensing of trademarks - Infring - Passing off action – Deceptive similarity - De	efusal of Regi ement. Reme	istration: dies and	Absolute	Ground	l and Re	lativo	CO4
JNIT-V	Other Forms of IPR				Pe	riods: 9		
n designs - nisappropria	nature of Industrial Design - Subject Matter - Remedies for Infringement - Trade secret La tions of Trade Secrets- Protection for submis Indication (GI) - Procedure for registration - I	w-Determinationsion- ssion-Trade Se	on of Trecret litio	ade Secre	gement	of Copy - Liabil	ity for	CO5
ecture Peri	ods:45 Tutorial Periods: 0	Practi	cal Peri	iode: 0	Total	Doring	1. 45	
COLUMN TO SERVICE STATE OF THE PARTY OF THE		· idoti	-ui i CI	Jus. 0	1 Old	Periods	. 40	

Phidaerama

Dr.S. SUNDARARAMAN, M.Tech., Ph. 2... Professor & Head

Department of Civil Engg Sri Manakula Vinayagar Engg. College Madagadiset, Puducherry, India

2.A.7.204

#### **Text Books**

- Nithyananda, K. V. Intellectual Property Rights: Protection and Management, 2<sup>nd</sup> edition, Cengage Learning India Private Limited, 2019.
- 2. Neeraj, P., and Khusdeep, D. Intellectual Property Rights, 2nd edition, PHI Learning Private Limited, 2018.

#### Reference Books

- 1. Ahuja, V. K. Law Relating to Intellectual Property Rights, 2<sup>nd</sup> edition, Lexis Nexis, 2017.
- 2. Bouchoux, Deborah E. Intellectual Property: The Law of Trademarks, Copyrights, Patents, and Trade Secrets, 4<sup>th</sup> edition., Cengage Learning, 2013.
- 3. Ganguli P. Intellectual Property Rights: Unleashing the Knowledge Economy. Tata McGraw-Hill Publishing Company; 2022.
- 4. Jyoti Rattan. Intellectual Property Rights, 2nd edition, Bharat Law House, 2024.
- 5. Surendra Malik and Sudeep Malik, Supreme Court on Intellectual Property, Eastern Book Company, 2022.

#### Web References

- 1. https://www.wipo.int/about-ip/en/
- 2. https://www.uspto.gov/patents/basics/general-information-patents
- 3. https://www.wto.org/english/tratop e/trips e/trips e.htm
- 4. https://www.epo.org/about-us/annual-reports-statistics/annual-report.html
- 5. https://articles.manupatra.com/article-details/Patent-Types-Laws-related-to-them-in-India
- 6. https://www.inta.org/trademarks/trademark-basics/.

#### \*TE-Theory Exam, LE-Lab Exam

COs/POs/PSOs Mapping

			1-1-3												
Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1.	PSO2	PSO3
CO1	1	1		-	1	3	2	2	18 <u>-</u> 17	2	1	2	3	2	1
CO2	1	2	-	2	- 1-	3	2	2	-	2	1	1	3	2	1
CO3		2	-	-	-	2	2	3	-	2	inis e	1	3	2	1
CO4	1	1	- 1		35 <u>-</u> 1	3	2	2		2	1	1	3	2	1
CO5	1	2				3	3	2	(in-1-)	2	1	1	3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

		Inte	rnal Assess	ment Marks (IAM)		End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Dr.S. SUNDARARAMAN, M.Tech., Ph.J.,
Professor & Head
Department of Civil Engg

Sri Manakula Vinayagat Erigg. Cellege Madagadiaet, Puducherry, India

2. A.7.20 B

Semester	MB		Programme	B.Tec	h				***************************************
Semester	V/V		Course Cate OE	gory Co	de: *	End Sem	nester E	xam Ty <sub>l</sub>	pe: Ti
Course Code	1123	BHSOC03	Pe	riods/\	/eek	Credi	tMaxim	um Mark	(S
Course Name		ANCE FOR ENGINEERS	L	Ţ	P	C	CAM	ESE	TN
Oodise Name	FIN		3	0	0	3	25	75	100
D	I NI-I	Common to	ALL Branches						
Prerequisite	Nil						***************************************		
	On c	ompletion of the course, the stud						BT Ma (High Lev	hest
	CO1	Explain the objectives, scope, an and differentiate between profit ma	aximization and w	ealth m	aximizati	on.		K	
	CO2	Apply the concepts of the time v investment appraisal techniques decision-making.	alue of money to	o engine	eerina pr	oiects a	nd use iod for	K	3
Course Outcomes	CO3	Demonstrate the steps in the capi cost-benefit and sensitivity analysi	s for evaluating e	ngineer	ing proje	cts.		K	3
	CO4	Analyze financial statements, inc from an engineering perspective financial performance of engineering	uding balance s , and evaluate	heets a	nd incor	ne state	ments, ss the	K	4
	CO5	Analyze different types of costs, sevaluate cost-benefit analysis and making.	uch as fixed, va	riable, a alysis fo	and marg or engine	inal cost ering de	s, and cision-	K	4
JNIT-I-	Intro	duction to Financial Management				Per	riods: 9		•••••••••••••••••••••••••••••••••••••••
Strategy: Short	t-Term a	Management: Objectives, Scope	, and Role in E	Enginee	ring - Fi	nancial	Plannin	g and	
Role of Enginering Dis	eering sciplines	Managers in Financial Decision	oncepts: Profit N - Making, Relat	laximiza	ation ve 1	Vealth M Financ	Maximiza e and	ation	CO1
Role of Enginering District Indicates of Ind	eering sciplines  Time  Money: ons - In	Managers in Financial Decision  E Value of Money and Investment  Concept, Importance and Applicativestment	oncepts: Profit M - Making, Relat - Decisions - Decisions	laximizationship	ect, Pres	Per ent Value	Maximizate and Finds: 9	Other	
Role of Enginering Dis	eering sciplines Time Money: ons - In (Theory	Managers in Financial Decision  E Value of Money and Investment  Concept, Importance and Applicate vestment Appraisal Techniques: Part only) and Profitability Index (PI) - Financial Decision	oncepts: Profit M - Making, Relat - Decisions - ions in Engineeriayback Period, N Risk Analysis in Ir	laximizationship	ect, Pres	Vealth Marking Finance  Per ent Value (NPV), on Makir	Maximizate and Finds: 9 He and Finternaling.	Other	
Role of Enginering District Indicates of Indiana India	Money: ons - In (Theory  Cap  ng Procent for Procents)	Managers in Financial Decision  E Value of Money and Investment  Concept, Importance and Applicate vestment Appraisal Techniques: Pay only) and Profitability Index (PI) - Fital Budgeting for Engineering Press: Steps and Key considerations piect, Cost - Benefit Analysis in E	oncepts: Profit M - Making, Relat - Decisions - Decisions - Indicate the second of the	ionship ing Projet Presenvestme	ect, Present Value	Per Period Fermana Pe	Maximizate and Friods: 9 lie and Fringering.	Other  -uture I Rate	CO2
Role of Enginering District Indicates of Engineering District Indicates of Engineering District Indicates of Engineering Indicates Indicates of Engineering Indicates	Money:  One - In  (Theory  Cap  ng Procent for Procent Evaluation	Managers in Financial Decision  E Value of Money and Investment  Concept, Importance and Applicate vestment Appraisal Techniques: Pay only) and Profitability Index (PI) - Fital Budgeting for Engineering Press: Steps and Key considerations piect, Cost - Benefit Analysis in E	oncepts: Profit M - Making, Relat - Decisions  ions in Engineeri ayback Period, N Risk Analysis in Ir ojects  Techniques for ngineering Proje	ionship ing Projet Presenvestme	ect, Present Value	Per ent Value (NPV), on Making Per p	Maximizate and Friods: 9 lie and Fringering.	Other  -uture I Rate	CO2
Role of Enginengineering Dis INIT-II  ime Value of I 'alue Calculation's Return (IRR)  INIT-III  apital Budgetin low Estimation rees for Project  NIT-IV  troduction to nancial States	Money: ons - In (Theory  Cap  ng Proce for Proce t Evalua  Financia ment In	Managers in Financial Decision  E Value of Money and Investment  Concept, Importance and Applicate vestment Appraisal Techniques: Pay only) and Profitability Index (PI) - Fital Budgeting for Engineering Press: Steps and Key considerations bject, Cost - Benefit Analysis in Ention.	oncepts: Profit M - Making, Relat - Decisions  ions in Engineeri ayback Period, N Risk Analysis in Ir  ojects  Techniques for ngineering Proje  rsis  come Statement, iduidity Profitab	ing Projet Presenvestme  Evaluation, Sen  and ar	ect, Present Value ent Decision Engine	Per Pering Per	Maximizate and Fiods: 9 Ite and Finternal ng. iods: 9 Project, (and Decisions: 9	Other  Other  Tuture I Rate  Cash- cision  C	CO2
Role of Enginering District Ingineering District Ingineering District Ingineering District Ingineering District Ingineering District Ingineering Ingin	Money: ons - In (Theory  Cap  ng Proce for Proce t Evalua  Fina  Financia ment In	Managers in Financial Decision  E Value of Money and Investment Concept, Importance and Applicate vestment Appraisal Techniques: Para only) and Profitability Index (PI) - Fital Budgeting for Engineering Propess: Steps and Key considerations of Digect, Cost - Benefit Analysis in Engineering Propess: Statements and Ratio Analysis al Statements: Balance Sheet, Inciterpretation - Financial Ratios: Legisland	oncepts: Profit M - Making, Relat - Decisions  ions in Engineeri ayback Period, N Risk Analysis in Ir ojects  Techniques for ngineering Proje  rsis  come Statement, iquidity, Profitab alysis in Engineer	ing Projet Presented in Sentented in Sentent	ect, Present Value ent Decision Engine	Per ent Value (NPV), on Making Per ering Per e	Maximizate and Fiods: 9 Ite and Finternal ng. iods: 9 Project, (and Decisions: 9	Other  Other  Tuture I Rate  Cash- cision  C	CO2
Role of Enginering District Project Project Project Project Project Project Project Project Production to inancial States inancial Performancial Performancial Performancial Analysis	Money: ons - In (Theory  Cap  In for Proceed Evaluation  Financial ment In mance E  Cost  Cost	Managers in Financial Decision  E Value of Money and Investment Concept, Importance and Applicat vestment Appraisal Techniques: Pa vonly) and Profitability Index (PI) - F  ital Budgeting for Engineering Pr  ess: Steps and Key considerations oject, Cost - Benefit Analysis in Ention.  Incial Statements and Ratio Analy  al Statements: Balance Sheet, Inciterpretation - Financial Ratios: Levaluation - Limitations of Ratio Analy	oncepts: Profit Making, Relat  Decisions  ions in Engineeri ayback Period, N Risk Analysis in Ir  ojects  Techniques for ngineering Proje  rsis  come Statement, iquidity, Profitab alysis in Engineer  nomic Analysis	ing Projet Presenvestme  Evaluation, Sen  and arility - Ering Proj	ect, Present Value ing Engire sitivity A	Per	Maximizate and Finds: 9 Internal Ing. Inds: 9 Project, (and Declines: 9 Perspective Studies: 9	Cash-cision C	CO2

Dr.S. SUNDARARAMAN, M.Tech., Ph.J...
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Madagadipet, Puducherry, Initia

2. A. 7.206

#### **Text Books**

- 1. Sullivan WG, Wicks EM, Koelling CP. Engineering Economy. 17th edition. Pearson; 2020.
- 2. Brealey RA, Myers SC, Allen F. Principles of Corporate Finance. 19th edition. McGraw-Hill Education; 2022.
- 3. Brigham EF, Houston JF. Fundamentals of Financial Management. 15th edition. Cengage Learning; 2019.

#### Reference Books

- 1. Ranganath BJ, Sinha KK. Financial Management for Engineers. 4th edition. Vikas Publishing House; 2018.
- 2. Crundwell F. Finance for Engineers: Evaluation and Funding of Capital Projects. Springer; 2017.

#### Web References

- 1. https://www.netsuite.com/portal/resource/articles/financial-management/financial-management.shtml
- 2. https://www.investopedia.com/ask/answers/033015/why-time-value-money-tvm-important-concept-investors.asp
- 3. https://omnicard.in/blogs/capital-budgeting-24042024
- 4. https://www.linkedin.com/pulse/role-capital-budgeting-process-engineering-studies-ashraf
- 5. https://corporatefinanceinstitute.com/resources/accounting/financial-ratios/
- 6. https://www.dau.edu/acquipedia-article/engineering-cost-estimation-method

#### \*TE-Theory Exam, LE-Lab Exam

COs/POs/PSOs Mapping

Course Outcomes (COs)	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	Program Specific Outcomes (PSOs)		
													PSO1	PSO2	PSO3
CO1	1	2		-		1	1	1		2	1	1	3	2	1
CO2	1	2	1	-1	1	2	1	2	_	3	1		3	2	1
CO3	<u> -</u>	3	3		1	3	1	2	_	3	1	1	3	2	1
CO4	1	2		2	1	1	2	1	1	2	1		3	2	1
CO5	11-	3	4.		2	3	2	2	1	2	2	2	3	2	1

Correlation Level: 1 - Low, 2 - Medium, 3 - High

#### **Evaluation Methods**

Assessment		Inte	End Semester				
	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Total Marks
Marks	5	5	5	5	5	75	100

<sup>\*</sup> Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

1. Judaciana

Pr.S. SUNDARARAMAN, M.Tech., Pa.2
Professor & Head
Department of Civil Engg
Sri Manakula Vinayagar Engg. College
Maddgadipet, Puducherry, India