DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE
(AUTONOMOUS)
(Approved by AICTE & Affiliated to Anna University, Chennai)
Re-Accredited by NAAC with 'A' Grade
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PERAMBALUR-621212, TAMILNADU, INDIA.
Website: www.dsengg.ac.in

COURSE PLAN

Name of the faculty				
Designation/Department	Assistant Professor/Civil Engineering			
Course code/Name	U20CE861/Prefabricated Structures			
Year/Section/Department	IV/-/ Civil Engineering			
Credits details	L:3	T: 0	P: 0	C:3
Total contact hours required	45 hours			

Syllabus:

UNIT I/ INTRODUCTION	**No. of Periods: 9**
Need for prefabrication–Principles–Materials–Modular coordination– Standarization– Systems Production – Transportation – Erection	
UNIT II/ PREFABRICATED COMPONENTS	**No. of Periods: 9**
Behaviour of structural components – Large panel constructions – Construction of roof and floor slabs Wall panels – Columns – Shear walls	
UNIT III/ DESIGN PRINCIPLES	**No. of Periods: 9**
Disuniting of structures- Design of cross section based on efficiency of material used – Problems in design because of joint flexibility – Allowance for joint deformation.	
UNIT IV/ JOINT AND CONNECTIONS INSTRUCTURAL MEMBERS	**No. of Periods: 9**
Types of joints-based on action of forces – compression joints – shear joints – tension joints – based on function – construction, contraction, expansion. Design of expansion joints – Dimensions and detailing – Types of sealants – Types of structural connections – Beam to column – Column to Column – Beam to Beam – Column to foundation	
UNIT V/ DESIGN FOR ABNORMAL LOADS	**No. of Periods: 9**
Progressive collapse–Code provisions–Equivalent design loads for considering abnormal eff such as earthquakes, cyclones,etc., -Importance of avoidance of progressive collapse.	

Objectives:

- To make the students conversant with the basic concept of ecology,environment and chemistry involved.
- To impart knowledge to students on modular construction, industrialized construction and design of prefabricated elements and construction methods
- To make the students gain basic knowledge of effects of earthquake
- To give basic knowledge about importance of the prefabricated structures.

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Text Books:

T1.DR.R.Saravanan & R.Dinesh kumar "prefabricated structure" LAKSHMI PUBLICATIONS

T2. Dr.A.Jebamalar & Mr.S.Sampath kumar "Prefabricated Structures" MAGNUS PUBLICATIONS

Reference Books:

R1. Koncz T., Manual of precast concrete construction, Vols. I, II and III, Bauverlag, GMBH, 1971.

R2. Structural design manual, Precast concrete connection details,Society for the studies in the use of precast concrete, Netherland Betor Verlag, 1978.

Websites:

W1. http://www.nptel.ac.in2012/04/Prefabricatedstructures
W2. http://www.e-booksdirectory.com/listing.php?category=105
W3. http://www.faadooengineers.com/forums/43-Prefabricatedstructures
W4. http://bookboon.com/en/Prefabricatedstructures

Online Mode of Study (if Any):

- http://nptel.ac.in/courses/114106037/11
- http://projectabstracts.com

Course Plan:

Topic No	Topic	Reference Detail	Page Number	Mode of teaching	Number of Periods Required	Cumulative Period
UNIT-I INTRODUCTION						
1	Need for prefabrication	T2	1.2-1.22	BB	1	1
2	Principles	T2	1.23-1.24	BB	1	2
3	Materials	T2	1.26-1.27	BB	1	3
4	Modular coordination	T2	1.30-1.52	BB	1	4
5	Standardization	T2	1.53-1.54	BB	1	5
6	Systems	T2	1.54-1.55	BB	1	6
7	Production	T2	1.59-1.63	BB	1	7
8	Transportation	T2	1.65-1.67	BB	1	8
9	Erection	T2	1.67-1.77	BB	1	9
Outcome of Unit I: **CO1:** At the end of the unit, students will gain the knowledge of basic necessity of prefabricated structures						
UNIT –II PREFABRICATED COMPONENTS						
10	Introduction and behaviour of structural components	T2	2.1-2.9	BB	1	10
11	Large panel constructions– classification and behaviours of various elements	T2	2.11-2.13	BB	1	11
12	Functions of large panel constructions	T2	2.14	BB	1	12
13	Large panel constructions	T2	2.18	BB	1	13
14	Behaviors and construction of roof slab	T2	2.21-2.29	BB	1	14
15	Behavior and construction of floor slab	T2	2.21-2.29	BB	1	15
16	Columns–types and behaviors	T2	2.5	BB	1	16
17	Shear walls	T2	2.32-2.46	BB	1	17
18	Shear walls	T2	2.32-2.46	PPT	1	18

Outcome of Unit II:

CO2: At the end of the unit, students will able to understands the concepts of design of various types of panels.

UNIT–III DESIGNPRINCIPLES						
19	Disuniting of structures-introduction advantages and disadvantages	T2	3.1	BB	1	19
20	Steps involved in the process of disuniting of structures	T2	3.7	BB	1	20
21	Design of cross section based on efficiency of material used	T2	3.14	BB	1	21
22	Design of cross section based on efficiency of material used	T2	3.17	BB	1	22
23	Design of cross section based on efficiency of material used	T2	3.22	BB	1	23
24	Problems in design because of joint flexibility	T2	3.23	BB	1	24
25	Problems in design because of joint flexibility	T2	3.25	BB	1	25
26	Allowance for joint deformation.	T2	3.26-3.30	BB	1	26
27	Allowance for joint deformation	T2	3.26-3.30	PPT	1	27

Outcome of Unit III:

CO3: At the end of the unit, students will able to understand the concepts of disuniting.

UNIT – IV JOINT IN STRUCTURAL MEMBER						
28	Types of joints-based on action of forces	T2	4.1	BB	1	28
29	compression joints – shear joints – tension joints	T2	4.2	BB	1	29
30	based on function ,construction, contraction, expansion	T2	4.7	BB	1	30
31	Design of expansion joints	T2	4.39	BB	1	31
32	Dimensions and detailing	T2	4.39	BB	1	32
33	Types of sealants	T2	4.43	BB	1	33
34	Types of structural connections and disadvantages, limitations	T2	4.43	BB	1	34
35	Beam to column-Column to Column	T2	4.46	BB	1	35

36	Beam to Beam – Column to foundation	T2	4.46	BB	1	36
Outcome of Unit IV: **CO4:** At the end of the unit, students will come to know about advantages and disadavantages of connections and joints						
UNIT-V DESIGN FOR ABNORMAL LOADS						
37	Progressive collapse	T2	5.10	BB	1	37
38	Codal provision for abnormal loads	T2	5018	BB	1	38
39	Equivalent design loads for considering abnormal effects such as earthquakes	T2	5.40-5.53	BB	1	39
40	Equivalent design loads for considering abnormal effects such as earthquakes	T2	5.40-5.53	BB	1	40
41	Equivalent design loads for considering abnormal effects such as cyclones	T2	5.40-5.53	BB	1	41
42	Equivalent design loads for considering abnormal effects such as cyclones	T2	5.40-5.53	BB	1	42
43	Importance of avoidance of progressive collapse.	T2	5.40-5.53	BB	1	43
44	Case study for building code approaches to progressive collapse	T2	5.40-5.53	BB	1	44
45	Case study for building code approaches to progressive collapse	T2	5.40-5.53	BB	1	45
Outcome of Unit V: **CO5:** At the end of the unit, students will able to know how to design PFS for abnormal loads						

Course Outcomes:

At the end of course, Students should be able to:

CO1: Design some of the prefabricated elements.

CO2: Understand the basic necessity of prefabricated structures

CO3: Design of various types of panels

CO4: Find out problems in disuniting and disuint the elements.

CO5: Design the PFS for abnormal loads..

Course Outcome Vs Program Outcome Mapping:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2		3		3			3	2	2	2	2	2
CO2	1	2		3		3			3	2	2	2	2	2
CO3	1	2		3		3			3	2	2	2	2	2
CO4	1	2		3		3			3	2	2	2	2	2
CO5	1	2		3		3			3	2	2	2	2	2
AVG	1	2		3		3			3	2	2	2	2	2

Content beyond Syllabus:

- ❖ Bridge design using Prefabrication components.

Internal Evaluation Components:

Webportal	Assignment	Components	Topic Number with Topic / Unit Details	Relevance to CO
Webportal 1	**--**	**Assessment – I (60)**	**Unit I and II**	**CO 1 & CO2**
	1	**Assignment – Handwritten (20)**	• 5. Indian Standarization for Various structures. • 14. Construction of roof and floor slabs.	**CO1** **CO2**
	2	**Assignment – Poster Presentation / PPT (20)**	• 4. Modular coordination • 10.Behaviour of structural components	**CO1** **CO2**
Webportal 2	**--**	**Assessment – II (60)**	**Unit III and IV**	**CO3 & CO4**
	3	**Seminar (20)**	• 21. Design of cross section based on efficiency of material. • 28. Types of joints	**CO3** **CO4**
	4	**Case Study Report (20)**	• 39. Behaviour of PFS during natural disasters. • 45. Avoidance of progressive collapse.	**CO3** **CO4**

Webportal 3	**--**	**Model Exam (75)**	**Unit I to V**	**CO1 to CO6**
	5	**MCQ (15)**	**Unit I to V**	**CO1 to CO6**
	-	**Course Attendance (10)**	**--**	**--**

Submission Details:

Phase 1(Before AT 1)		**Phase 2 (Before AT 2)**		**Phase 3 (Model)**
Assignment 1	**Assignment 2**	**Assignment 3**	**Assignment 4**	**Assignment 5**

Google Class Code Details:
Class Name:

PLAN OF ASSESSMENT TEST –DISTRIBUTION OF MARKS:

TEST	**CO- MARK WISE DISTRIBUTION**						**BLOOM'S LEVEL MARK WISE DISTRIBUTION**					
AT-1	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**BTL1**	**BTL2**	**BTL3**	**BTL4**	**BTL5**	**BTL6**
AT-2	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**BTL1**	**BTL2**	**BTL3**	**BTL4**	**BTL5**	**BTL6**
MODEL	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**BTL1**	**BTL2**	**BTL3**	**BTL4**	**BTL5**	**BTL6**

Prepared By

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