



**DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE  
(AUTONOMOUS)**

(Approved by AICTE & Affiliated to Anna University, Chennai)  
Re-Accredited by NAAC with 'A' Grade  
Accredited by NBA for AERO, BME, CSE, ECE, EEE, IT & MECH.

**PERAMBALUR-621212, TAMILNADU, INDIA.**

Website: [www.dsengg.ac.in](http://www.dsengg.ac.in)



**COURSE PLAN**

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

**Syllabus:**

<b>UNIT I/ INTRODUCTION</b>	<b>No. of Periods: 9</b>
Need for prefabrication–Principles–Materials–Modular coordination– Standarization– Systems Production – Transportation – Erection	
<b>UNIT II/ PREFABRICATED COMPONENTS</b>	<b>No. of Periods: 9</b>
Behaviour of structural components – Large panel constructions – Construction of roof and floor slabs Wall panels – Columns – Shear walls	
<b>UNIT III/ DESIGN PRINCIPLES</b>	<b>No. of Periods: 9</b>
Disuniting of structures- Design of cross section based on efficiency of material used – Problems in design because of joint flexibility – Allowance for joint deformation.	
<b>UNIT IV/ JOINT AND CONNECTIONS INSTRUCTURAL MEMBERS</b>	<b>No. of Periods: 9</b>
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	
<b>UNIT V/ DESIGN FOR ABNORMAL LOADS</b>	<b>No. of Periods: 9</b>
Progressive collapse–Code provisions–Equivalent design loads for considering abnormal effects 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.

**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.in/2012/04/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
<b>UNIT-I INTRODUCTION</b>						
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
<b>Outcome of Unit I:</b>						
<b>CO1:</b> At the end of the unit, students will gain the knowledge of basic necessity of prefabricated structures						
<b>UNIT –II PREFABRICATED COMPONENTS</b>						
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
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**Outcome of Unit IV:**

**CO4:** At the end of the unit, students will come to know about advantages and disadvantages 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:**

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| ❖ Bridge design using Prefabrication components. |
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**Internal Evaluation Components:**

Webportal	Assignment	Components	Topic Number with Topic / Unit Details	Relevance to CO
Webportal 1	--	Assessment – I (60)	<b>Unit I and II</b>	CO 1 & CO2
	1	Assignment – Handwritten (20)	<ul style="list-style-type: none"> <li>• 5. Indian Standardization for Various structures.</li> <li>• 14. Construction of roof and floor slabs.</li> </ul>	CO1 CO2
	2	Assignment – Poster Presentation / PPT (20)	<ul style="list-style-type: none"> <li>• 4. Modular coordination</li> <li>• 10. Behaviour of structural components</li> </ul>	CO1 CO2
Webportal 2	--	Assessment – II (60)	<b>Unit III and IV</b>	CO3 & CO4
	3	Seminar (20)	<ul style="list-style-type: none"> <li>• 21. Design of cross section based on efficiency of material.</li> <li>• 28. Types of joints</li> </ul>	CO3 CO4
	4	Case Study Report (20)	<ul style="list-style-type: none"> <li>• 39. Behaviour of PFS during natural disasters.</li> <li>• 45. Avoidance of progressive collapse.</li> </ul>	CO3 CO4

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

**Submission Details:**

<b>Phase 1(Before AT 1)</b>		<b>Phase 2 (Before AT 2)</b>		<b>Phase 3 (Model)</b>
<b>Assignment 1</b>	<b>Assignment 2</b>	<b>Assignment 3</b>	<b>Assignment 4</b>	<b>Assignment 5</b>

**Google Class Code Details:**

Class Name:

**PLAN OF ASSESSMENT TEST –DISTRIBUTION OF MARKS:**

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

**Prepared By**

**Verified By  
(HOD/CIVIL)**

**Approved By  
(PRINCIPAL)**