

M. Tech. –Ist year Semester – II

Subject Name: Pre Engineered Buildings

Subject Code: MTST14205

Type of course: PE-IV

Prerequisite: Design of steel structure, design of concrete structures

Rationale: Pre-engineered buildings are a predetermined inventory of raw materials. It satisfies a wide range of structural and aesthetic requirements. In the fast development of infrastructural era, it is needed to erect the building in shortest period of time without compromising the aesthetics and stability. This subject enables student to design the components of frame and to execute the procedure.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	150
3	0	2	4	60	25	15	30	20	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Introduction Introduction – Background – Necessity- Merits of Pre Engineered Buildings - Applications of PEB – Materials used for constructing of PEB. Difference between Conventional Steel Buildings and Pre-Engineered buildings.	8	20 %
2	Components of PEB Primary Frame System: Main frames, Gable End Frame - Secondary frame system: Sizes and Properties of Purlins and Girts, Bracing System: Rod, angle, Portal, Pipe bracing – Sheeting and Cladding: Roof Sheeting and Wall sheeting – Accessories: Turbo Ventilators, Ridge vents, Sky Lights, Louvers, Insulation, Stair cases, fire safety	10	25%
3	Design Loads Loads to be considered for design of PEB, Design of PEB frame under the influence of Dead, Live, Collateral, Wind, Seismic and Other applicable Loads. Serviceability Limits as per code.	10	25%
4	Codal Provisions for Design of Frame Design Parameters of PEB Frames - Depth of the section, Depth to	15	30 %

PE: Program Elective

	Flange width ratios, Thickness of Flange to thickness of Web ratio. d/tw, bf/tf ratios of sections as per IS code. Selection of Section as per Manufacturing Limitations. Analysis and Design of Rigid Frames. Rigid Frame Moment Connection, Shear Connection-Anchor bolt and base plate design, Equipments for horizontal and vertical transportation.		
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Suggested Specification table with Marks (Theory/Practical):

% Distribution of Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10%	20%	30%	15%	20%	05%

Legends: R: Remembrance, **U:** Understanding; **A:** Application, **N:** Analyze, **E:** Evaluate **C:** Create and above Levels (**Revised Bloom's Taxonomy**)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Text Books:

Sr. No.	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	Metal Building Systems Design and Specifications,	Alexander Newman	McGraw-Hill Education ISBN: 9780071828963	2015	3 rd
2.	Pre Engineered Steel Buildings	K. S. Vivek & P. Vaishavi	Lambert Academic Publishing ISBN-10 : 3330334797 ISBN-13 : 978-3330334793	2017	3 rd
3.	Pre fabricated structures	V. Soundararajan ,R. Jagadeeshkumar, S KalpanaDevi	ARS publications	2013	-
4.	Prefabricated Structures	Dr. R. Ganesan and Mrs. A. Latha	Sree Kamalamani Publications ISBN-10 : 8192663639 ISBN-13 : 978-8192663630	2014	-

5	Prefabricated Systems: Principles of Construction	Ulrich Knaack	Birkhauser ISBN-10 : 3764387475 ISBN-13 : 978-3764387471	2012	-
6.	Small-Scale Public Transportable and Pre-Fabricated Buildings: Evaluating their Functional Performance	Junjie Xi	Routledge; ISBN-10 : 0367502585 ISBN-13 : 978-0367502584	2020	1 st

Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	classify different materials used for pre-engineered buildings	15
CO-2	Identify codal provisions and understand an importance of standardization, modular construction, tolerances as per national building code of practice.	20
CO-3	classify pre-engineered building components	20
CO-4	classify different design loads on pre-engineered buildings	25
CO-5	apply pre-engineered building design methodology	20

List of Tasks to be performed by Students:

Group of Students have to prepare presentation based on topics of subject as well as individually students have to write / solve assignments. It is suggested to visit the site and detailed visit report is to be prepared.