GOVERNMENT POLYTECHNIC, PURI
DEPARTMENT OF CIVIL ENGINEERING

Discipline: **CIVIL ENGG.**	Semester: 6TH	Name of the Teaching Faculty: - **Miss KUSMITA NAYAK**
Subject: **ACT & E (Th03)**	No. of days/per week class allotted: 04	Semester From date: 10.03.2022 To Date: 10.06.2022 No. of Weeks:15
PRE-REQUISITE	Basic knowledge about advanced materials and advanced construction techniques should be applied.	
COURSE OUTCOMES	1. Select proper material during construction in domain of advanced materials including fibers, artificial timbers etc. 2. Select appropriate prefabrications in pursuance of standard codes 3. Adopt structural requirements and possible retrofits to improve earthquake resistance	
	4. Comprehend requirement of various services need to be operational 5. Understand the role of different construction earth moving equipments and select during planning 6. Comprehend necessity of soil reinforcing and prescribe appropriate strategy	

Week	Class day	TOPICS	Delivery Method
1ST	1ST	**1. Advanced construction materials** 1.1 Fibers and Plastics Types of fibers- Steel, Carbon, glass fibers, Use of fibers as construction material	Whiteboard
	2ND	Properties of Fibers. Types of plastics- PVC, RPVC, HDPE, FRP, GRP etc.	Whiteboard
	3RD	Colored plastic sheets. Use of plastic as construction material.	Whiteboard
	4TH	1.2 Artificial Timbers – Properties and uses of artificial timber	Whiteboard
2ND	1ST	Types of artificial timber available in market,	Whiteboard
	2ND	Strength of artificial timber.	Whiteboard
	3RD	1.3 Miscellaneous materials – Properties and uses of acoustics materials,	Whiteboard
	4TH	Wall claddings, plaster boards, micro-silica	Whiteboard
3RD	1ST	Artificial sand, bonding agents, adhesives etc.	Whiteboard
	2ND	**Quiz and assignment**	Whiteboard
	3RD	**2. Prefabrication** 2.1 Introduction, necessity and scope of prefabrication of buildings, history of prefabrication,	Whiteboard
	4TH	Current uses of prefabrication , types of prefabricated systems,	Whiteboard
4TH	1ST	Classification of prefabrication, advantages and disadvantages of prefabrication,	Whiteboard
	2ND	2.2 The theory and process of prefabrication,	Whiteboard
	3RD	Design principle of prefabricated systems,	Whiteboard
	4TH	Types of prefabricated elements, modular coordination.	Whiteboard
5TH	1ST	2.3 Indian standard recommendation for modular planning.	Whiteboard
	2ND	**Quiz and assignment**	Whiteboard
	3RD	**3. Earthquake Resistant Construction** 3.1 Building Configuration	Whiteboard
	4TH	3.2 Lateral Load resisting structures	Whiteboard
6TH	1ST	3.3 Building characteristics	Whiteboard
	2ND	3.4 Effect of structural irregularities-vertical irregularities,	Whiteboard
	3RD	Plan configuration problems.	Whiteboard
	4TH	3.5 Safety consideration during additional construction and alteration of existing Buildings.	Whiteboard

7TH	1ST	3.6 Additional strengthening measures in masonry building-corner reinforcement,	Whiteboard
	2ND	Lintel band, sill band, plinth band, roof band, gable band etc.	Whiteboard
	3RD	**Quiz and assignment**	Whiteboard
	4TH	**4. Retrofitting of Structures** 4.1 Seismic retrofitting of reinforced concrete buildings :	Whiteboard
8TH	1ST	Seismic retrofitting of reinforced concrete buildings :	Whiteboard
	2ND	4.2 Sources of weakness in RC frame building	Whiteboard
	3RD	Sources of weakness in RC frame building	Whiteboard
	4TH	4.3 -Classification of retrofitting techniques	Whiteboard
9TH	1ST	And their uses	Whiteboard
	2ND	**Quiz and assignment**	Whiteboard
	3RD	**5. Building Services** 5.1 Cold Water Distribution in high rise building, lay out of installation	Whiteboard
	4TH	5.2 Hot water supply – General principles for central plants-layout	Whiteboard
10TH	1ST	5.3 Sanitation –soil and waste water installation in high rise buildings	Whiteboard
	2ND	5.4 Electrical services – i) requirements in high rise buildings ii) Layout of wiring - types of wiring iii) Fuses and their types iv)Earthing and their uses	Whiteboard
	3RD	5.5 Lighting – Requirement of lighting, Measurement of light intensity	Whiteboard
	4TH	5.6 Ventilation - Methods of ventilation (Natural and artificial Systems of ventilation) problems on ventilation	Whiteboard
11TH	1ST	5.7 Mechanical Services- Lifts, Escalator, Elevators – types and uses.	Whiteboard
	2ND	**6. Construction and earth moving equipments** 6.1 Planning and selection of construction equipments	Whiteboard
	3RD	6.2 Study on earth moving equipments like drag line, tractor, Bulldozer, Power shovel	Whiteboard
	4TH	6.3 Study and uses of compacting equipments like tamping rollers, Smooth wheel rollers, pneumatic tired rollers and vibrating compactors	Whiteboard
12TH	1ST	Pneumatic tired rollers and vibrating compactors	Whiteboard
	2ND	6.4 Owning and operating cost – problems	Whiteboard
	3RD	**Quiz and assignment**	Whiteboard
	4TH	**7. Soil reinforcing techniques** 7.1 Necessity of soil reinforcing.	Whiteboard
13TH	1ST	7.2 Use wire mesh and geo-synthetics.	Whiteboard
	2ND	7.3 Strengthening of embankments,	Whiteboard
	3RD	Slope stabilization in cutting and embankments by soil reinforcing techniques.	Whiteboard
	4TH	**Quiz and assignment**	Whiteboard
14TH	1ST	REVISION	Whiteboard
	2ND	REVISION	Whiteboard
	3RD	REVISION	Whiteboard
	4TH	REVISION	Whiteboard

LEARNING RESOUCES

01 Advance Construction and Equipment — M.R. Samal
02 Earthquake resistant design of structures — S.K. Duggal

WEBSITE RESOUCES:

01. https://www.youtube.com/watch?v=Lng0hVDvsu0&list=PLOzRYVm0a6Sdtbpo_DP7acjsLYdmWT99r&index=1 (NPTEL)

SIGNATURE OF CONCERNED FACULTY

PRINCIPAL

Srinivas 10-03-2022
SIGNATURE OF HOD I/C