22CEPE02	BUILDING INFORMATION MODELLING		Semester		VI
PREREQUISITES		Category	PE	Credit	3
NIL		Hours/Week	L	T	P	TH

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		3	0	0	3

Course Learning Objectives

1	To impart the knowledge about the tools in Building Information Modelling .
2	To understand the concepts in HVAC system
3	To gain knowledge in scheduling the construction projects
4	To provide knowledge in estimation of cost of the projects
5	To understand the various clash in the models

Unit I	INTRODUCTION	9	0	0	9

Introduction to Building Information Modelling (BIM) -BIM Benefits- Construction and fabrication Benefits Design Benefits-Discussions of the Roles and Impacts of BIM in the Design - Tools (Autodesk /Tekla/ Bentley) - hardware system requirements

Unit II	BUILDING INFORMATION MODELLING WORKFLOW	9	0	0	9

Quantification - Perform Virtual Take off - Perform 2D takeoff - Manage Takeoff Data - Update and Analyze data - Export Takeoff Data - Autodesk Rendering - Autodesk Rendering Overview - Adding Materials to a Model - Creating and Editing Materials - Material Mapping - Lighting - Sun and Sky Lights -Exposure Control - Ground Planes - Photorealistic Rendering - Data visualization

Unit III	BUILDING INFORMATION MODELLING – ARCHITECTURE, STRUCTURE	9	0	0	9

Creation of Architectural and Structural models 3D - Structure and MEP- Creating Sets- Building Elements Structural Systems- Planning and Design - Intrusion detection - Lighting Control - Indoor Air quality services - Elevators/ escalators - parking lot monitoring system - card and keypad access - fire safety - Model checking - Information retrieval

Unit IV	CONSTRUCTION MANAGEMENT	9	0	0	9

Project Management- Construction Engineering and Management- Facility Management - BIM based Quantity and Cost Estimation - BIM 4D Simulation: Project scheduling and construction-based monitoring - Construction Cost Estimating and Scheduling - BIM 360 – Cloud based BIM Management

Unit V	BUILDING INFORMATION MODELLING DESIGN COORDINATION AND CLASH ANALYSIS	9	0	0	9

BIM and Clash Detection- BIM and Elements of Cost Estimation 5D - Clash Detection - Over View of Clash Detective Tool - Clash detective Window - Working With Clash tests - Use Clash Tests - Set Clash Rules - Select Object for Clashing - View Clash results - Produce clash Reports - Introduction to Project life cycle information (6D) - Collaboration - data handling - Point cloud - Risk assessment - Decision making

Total= 45 Periods

	Text Books:
1	Hardin, B., & McCool, D. (2015). BIM and construction management: proven tools, methods, and workflows. John Wiley & Sons.
2	Eynon, J. (2016). Construction Manager's BIM Handbook. John Wiley & Sons
	Reference Books:
1	Eastman, C., Teicholz, P., Sacks, R., & Liston, C. "BIM handbook: A guide to building information", 2011
2	Teicholz, P. (Ed.). "BIM for facility managers", John Wiley & Sons. 2013
3	Pittard, S., & Sell, P. (Eds.). "BIM and Quantity Surveying", Routledge. 2016
4	Duell, R., Hathorn, T, and Hathorn, T.R. "Autodesk Revit Architecture 2016 Essentials", Wiley and Sons, Inc. 2015
5	Raymond Issa, Svetlana Olbina "Building Information Modeling: Applications and Practices", American Society of Civil Engineers, 2015
6	IS 875(Part3)-2015: Wind Loads on Buildings and Structures

Course Outcomes: Upon completion of this course, the students will be able to:		Bloom's Taxonomy Mapped
CO1	Model the architectural features	Create
CO2	Analyse the efficiency of HVAC system	Analysis
CO3	Plan the schedule for the construction projects	Analysis
CO4	Estimate the cost of project	Apply
CO5	Interpret the clash analysis report	Analysis

COURSE ARTICULATION MATRIX

COs/ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	2	2	3	-	-	-	-	2	-	-	-	3	-
CO2	1	3	2	2	3	-	-	-	-	2	-	-	-	3	-
CO3	1	2	2	2	3	-	-	-	-	2	3	-	-	3	-
CO4	1	2	2	1	3	-	-	-	-	2	2	-	-	3	-
CO5	1	3	2	3	3	-	-	-	-	3	2	-	-	3	-
Avg	1	2.4	2	2	3	-	-	-	-	2.2	2.3	-	-	3	-
3/2/1 – indicates strength of correlation (3- High, 2- Medium, 1- Low)															