Building Information Modelling

Program Description

Course Name	Building Information Modelling
Course Name as on Certificate	Certification in Building Information Modeling
Certificate Type	Certificate of Completion by IITM Pravartak and L&T EduTech
Certificate Issued by	IIT MADRAS and L&T EduTech
Program Description	Building Information Modeling - BIM is an intelligent 3D model-based process that gives architectural, engineering and construction professionals the insight and tools to efficiently plan, design, construct and manage buildings and infrastructure. The course addresses the rapidly evolving needs of the built environment sector with respect to the emergence of BIM as a working practice. BIM manager plays a crucial role in advising clients, internal and external stakeholders on the benefits of BIM, and in implementing and managing the major BIM processes. This requires the demonstration of a complete knowledge of the BIM process & the ability to create the project environment in which BIM can realise its full potential. In this course, learners will be guided through each of the major project stages, from the strategic definition of the project right through to handover, operations, and end of use. At each stage, the trainer will demonstrate how to balance technical requirements with project management skills, so the students are confident in implementing BIM methodology. The course covers the key skills and competencies required for implementing BIM-Building Information Modelling to AECO-Architecture, Engineering, Construction & Operation projects. **Objectives**: • To learn the concept of Building Information Modeling • To understand the workflow followed in industry during creation of BIM 3D model which includes building the discipline-based model and create the federated models. • To explain the process of creating the BIM model • To comprehend the various emerging trends of BIM & concept of digital twin
Educational Qualification	• Students pursuing Diploma / UG / PG Programs in Civil, Mechanical, Electrical and other allied domains • Faculties in the field of Civil, Mechanical, Electrical and other allied domains • Working professionals in the above domains
Pre-Requisites	Basic knowledge about isometric structures and Engineering Graphics fundamentals are preferred
Course Content	**See Enclosed Progamme details – as Annexure 1**

Pedagogy	Online Self paced E-Learning Content		
Assessment	One Final Assessment		
Programme Faculty	**BS Mukund, Head – Building Information Modeling - L&T Construction** Mukund heads the BIM team in L&T Construction. In this role, he is responsible for providing strategic direction to the company, for providing digitally enabled value propositions, leveraging the power of BIM and digital solutions on engineering and construction projects. This includes development and deployment of new BIM technologies, processes and analytics for the organization to harness efficiency and productivity gains through project implementation.		
Duration	Weeks: 14; Hours: 28		
Class Schedule	Self-Paced		
Programme Highlights/USPs	• Evolution of BIM • Introduction to BIM • Design authoring using Revit • Visualisation • Interference/clash check using Revit • Documentation & Common Data Environment (CDE) • Level of Development • Field BIM • Introduction to 5D & Asset Information Model (AIM)		
Total Fees		**Total Fees (Rs.)**	
	Total Programme Fee	Rs. 5,100/- inclusive of Tax	

ANNEXURE 1

Proposed Course outline / programme / plan - Unit wise syllabus details.

Unit – I: Evolution of Engineering, Introduction to BIM Concepts and Design Authoring
Evolution of Engineering from 2D drawings to BIM Model, Isometric View, Limitation of Isometric views and concept of 3D-Modeling, Building Information Modeling – Introduction & Process, Design Authoring – Concepts and workflow, Fundamentals of Discipline Based Modeling, Introduction to stages of BIM Modeling process as per ISO 19650, Federated model- concepts and demonstrations, workflow of design coordination, Engineering Analysis – Concept and types of analysis, Process and workflow of Design Review in BIM.

Unit – II: Visualization and Interference/Clash check
Views in BIM Model, Visualization Modes, Walkthrough of the Model, Fly through the model, Layers & Properties, Concept of viewpoints, Sectioning and Visualization through Tablet and Mobile, Concept of BIM Kiosk & BIM Rooms, Visualization through Augment Reality (AR), Virtual Reality (VR) & Mixed Reality (MR) Clash Check – Types, Clash avoidance process, Clash Detection Process, Clash Detection Priority Matrix and Report generation, Clash Detection Rules, Report, Grouping, Clash Detection Process – Demo.

Unit – III: Documentation & CDE & Level of Development
Documentation and CDE (Common Data Environment) -2D drawings generation from BIM Model, Computer Network types, Concept of Cloud Computing, Concept and Application of CDE: Traditional Information Sharing, Definition, Reference, and Concept, Setting up the workflow and process for CDE- File naming convention, Roles and Responsibilities, Request for Information and Review Process Concept of LOD (Level of Development), preparation of LOD matrix and Progression matrix- Definition of LOD, Level of Detail and Information, LOD- Wall foundation, Precast Structural Inverted T-Beam, Domestic Water Piping, Plumbing Fixture, Packaged Generator Assembly, LOD- Chart, Matrix and Model Progression Matrix

Unit - IV: 4D / Field BIM & Its Applications
Introduction to 4D / Field BIM: Concept of 4D, Introduction to construction sequence and project schedule, Project scheduling using Gantt Chart and its limitation, 4D BIM Modeling- Project demo and workflow, Synchronization of 4D BIM Model with project schedule, Reviewing project progress w.r.t planned dates and actual dates, Generation of Reports Application of Field BIM/ 4D BIM: Understanding concept and usage of BIM in field for coordination- 3D Coordination and Visual Communication, Site utilization planning and Construction analysis, Application of wearables in coordination. 3D Control and planning Other Applications of Field BIM/ 4D BIM: Concept and usages of BIM in field for safety, disaster and risk analysis, digital fabrication and scan to BIM, Existing Condition Modeling, Phase Planning, As-built/ Record Models

Unit – V: 5D BIM, AIM & Beyond BIM - Emerging Trends
5D BIM: Introduction concepts of 5D BIM, Quantity take off with UoM, Concept of QTO with UoM, 5D BIM with UoM with cost, Quantity take off exercise, Demo of Quantity take off: Understanding QTO for Wall, Plaster & Tile, BIM Maturity LOD and General Practice of QTO, Cost Breakup structures, 5D BIM and cost control AIM: Introduction to Asset Information Model (AIM), COBie structures and Asset Information Deliverables, Space Attributes and Asset Attributes- Examples with data, Asset requirement- Discipline wise Infrastructure System, Classification code and Information Exchange, Information Exchange with Facility Management Beyond BIM: Emerging Trends- Concepts of Industrialisation, IoT, Big Data, Data Analytics and their applications in BIM: Industrialisation of Construction through BIM- DfMA, IoT in BIM, BIM and Big data, Data Analytics using AI & ML Future scope of BIM Applications: Smart Infrastructure and the need for connected infrastructure, Digital twins- Concepts and benefits, National Digital Twin or a City level Digital Twin in a Smart City, Fundamental requirements for the success of a Digital Twin and its uses, Digital Twin applications in diverse industries.