

Indian Institute of Technology, Kanpur

Proposal for a New Course

1. Course No: CE6XXM

2. Course Title: Building Information Modeling for the Built Environment

3. Per Week Lectures: 1(L), Tutorial: 3(T), Laboratory: __ (P), Additional Hours [0-2]: __ (A),
Credits (3*L+2*T+P+A): _9_ Duration of Course: Modular

4. Proposing Department/IDP: Civil Engineering

Departments/IDPs which may be interested in the proposed course: In the future:
Mechanical Engineering, Electrical Engineering, Sustainable Energy Engineering.

Other faculty members interested in teaching the proposed course: None

5. Proposing Instructor(s): Kaushik Bhattacharjee

6. Course Description: Elective course for Ph.D., Masters, and senior UG students

(A) Objectives:

- To understand and appreciate various aspects of Building Information Modeling (BIM), including what, why, and how of BIM.
- To expose students to the concepts of different dimensions of BIM and their importance in project management.
- To provide students with hands-on modeling exposure for BIM.
- To apprehend the processes and global practices needed for the successful implementation of BIM.

(B) Course contents

S. No	Broad Title	Topics	No. Lectures*	No. Tutorials#
1	Introduction to Building Information Modeling	Dynamics of Project Life Cycle, Causes for problems in construction, Definition of BIM, Need for BIM. Tutorial: Basics of AutoCAD Drawings, Introduction to Revit, Importing AutoCAD files to Revit, Levels, Grids, Elevations.	1	3
2	Levels of BIM	BIM Maturity Levels, Level of Development (LOD), Introduction of technology, people, and process aspects of BIM.	1	6

		Tutorial: BIM Family Creation, Foundation, Walls, Columns, Beams, Floors/Ceiling.		
3	BIM Execution Plans	Definition of BIM execution Plan, need for BIM Execution Plan, Process, Design of the Plan, Global cases, ISO 19650. Tutorial: Completion of 3D BIM model, Parametric vs non-parametric models, Quantity takeoff.	2	3
4	BIM and VR/AR	Definition of AR/VR/MR, Types of VR, Link with BIM, Usefulness in Construction. Tutorial: Generation of GFC, Introduction to Navisworks, Introduction to Scheduling.	1	3
5	Dimensions of BIM	Introduction to different dimensions of BIM (nD), Usefulness and drawbacks, Future of BIM, and Digital Twins. Tutorial: Clash detection, 4D simulation, Animations, Rendering.	2	6

*50-minute lecture each week, total of 7/8 lectures

#150 minutes of tutorial per week, where software will be taught in a supervised lab setup

(C) Prerequisites, if any: Instructor consent

(D) Short summary for inclusion in the Courses of Study Booklet:

This course provides a comprehensive framework for understanding and implementing Building Information Modeling (BIM) in construction projects. By bridging theoretical methodologies with robust practical application, the curriculum is designed to equip students with industry-ready engineering and project management competencies. Students will develop a foundational understanding of multi-dimensional BIM (3D to 7D), BIM maturity levels, and LOD. The course delves into the strategic formulation of BIM Execution Plans and explores how integrating emerging visualization technologies (AR/VR/MR) can solve common logistical and design problems in construction. Through intensive hands-on tutorials, students will transition from traditional 2D drafting to advanced digital modeling environments. Practical training focuses on translating architectural concepts into digital reality using industry-standard software platforms (including AutoCAD, Revit, and Navisworks) to manage building data effectively. Ultimately, this course ensures students graduate with both the strategic insight to manage BIM processes and the actionable technical skills required to lead BIM implementation in modern engineering.

7) Recommended Textbooks/References

1. Eastman, C., Teicholz, P., Sacks, R. & Liston, K. 2011. BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, Contractors, and Facility Managers, 3rd Edition, John Wiley & Sons.

2. Mordue, S., Swaddle, P., & Philp, D. (2015). Building information modeling for dummies. John Wiley & Sons. Hardin, B. & McCool, D., 2015.
3. BIM and Construction Management: Proven Tools, Methods, and Workflows. CEUR Workshop Proceedings, 2nd Rev. Ed., Sybex.

8) Any other remarks:

Dated: 11th September 2026

Proposer: Kaushik Bhattacharjee

Dated: _____

DPGC Convener: Amar Nath Roy Chowdhury

The course is approved/not approved.

Chairman, SUGC/SPGC

Dated: _____