

Branch Name:	Civil Engineering
Semester:	VII
Course Code:	BIM701
Course Name:	Clash Coordination using Navisworks and Common Data Environment (CDE)
Pre-requisite Course:	Detailed Knowledge of BIM, Revit, and Construction Project Workflows

Course Objective

- To provide in-depth knowledge and practical skills in BIM collaboration using Autodesk Navisworks and Common Data Environment.
- The course focuses on project coordination, clash detection, model aggregation, and cloud-based workflows for real-time collaboration and project management in construction.

Teaching Scheme (hours)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	--	6	5	30	20	50	50	150

Sr. No	Topic	Teaching Hrs.	Module Weightage
1	Module 1: Introduction to Navisworks & Process	06	10
	Concept of Coordination Metrix, Rules & Standards, clash coordination Process, File formats (NWC/NWD/NWF); basic navigation; viewpoints; sectioning tools.		
2	Module 2: Tools in Navisworks	08	15
	Interface and Visualisation Tools, Third person concept, Navigation tools, Appending and merging models from various disciplines, Creating sets, search sets, and viewpoints, Reviewing and commenting on design models		
3	Module 3: Clash Detection and Coordination	10	15
	Performing clash detection in Navisworks Manage, Clash rule creation and clash grouping, Coordination reports and issue tracking, Clash resolution workflow with Revit		
4	Module 4: Concept of 4D Construction Simulation	12	20
	Definitions, Pre-requisition, Process, Linking time schedules (MS Project / Primavera) to BIM models, Timeline, Basic Simulation Run,		
5	Module 5: Common Data Environment Study	10	15
	Definition, Requirements, Supporting Servers, Introduction to ACC, document control workflows, Project Set up, Data upload, Model uploads, version control, and shared views, Issue tracking		
6	Module 6: Final Clash Free Project Presentation	15	25
	Project setup using Revit + Navisworks + BIM 360/ACC, Clash free model, Revit Exported Drawings & Data set, Presentation and review of Clash free, detailed project		

Course Outcome

At the end of this course, the student will be able to

1. Understand the concepts and importance of BIM-based collaboration.
2. Aggregate and review multidisciplinary models in Navisworks.
3. Detect, analyze, and resolve clashes between building systems.
4. Construction Simulate using 4D BIM tools.
5. Set up and manage collaborative projects in CDE environment.
6. Produce reports and manage communication among stakeholders.

Scope of Course

- Prepares learners for roles such as BIM Coordinator, Digital Construction Manager, and VDC Engineer
- Applicable to real-world collaborative projects in construction firms, consultancies, and infrastructure projects
- Foundation for further exploration into Integrated Project Delivery (IPD), Lean Construction, and 5D BIM
- Industry readiness for working with CDEs (Common Data Environments)

Suggested Practical's

Module 1: Introduction to Navisworks & Process

1. Explore Navisworks interface and navigate models using viewpoints and sectioning.
2. Import Revit models into Navisworks (NWC/NWD/NWF formats).
3. Create a coordination matrix for a sample project.

Module 2: Tools in Navisworks

4. Append and merge architectural, structural, and MEP models.
5. Use navigation and visualization tools (walkthroughs, third-person view).
6. Create sets, search sets, and viewpoints for model review.
7. Add comments and redline markups on design models.

Module 3: Clash Detection & Coordination

8. Run clash detection between architectural and structural models.
9. Create clash rules and group clashes for better tracking.
10. Generate clash detection reports (HTML/Excel).
11. Perform clash resolution workflow by linking Navisworks issues back to Revit.

Module 4: 4D Construction Simulation

12. Link construction schedule from MS Project/Primavera to a BIM model.
13. Create a timeline simulation in Navisworks.
14. Run a basic 4D simulation and export it as a video for presentation.
15. Compare planned vs. actual simulation outcomes.

Module 5: Common Data Environment (CDE)

16. Set up a project in Autodesk Construction Cloud (ACC/BIM 360).
17. Upload and manage Revit/Navisworks models with version control.
18. Demonstrate issue tracking and assignment within CDE.
19. Create shared views and document control workflows.

Module 6: Final Clash-Free Project Presentation

20. Develop a multi-disciplinary model (architecture + structure + MEP).
21. Perform clash detection until a clash-free model is achieved.
22. Export Revit drawings and datasets from the coordinated model.
23. Present the final clash-free project with reports, 4D simulation, and CDE setup.