Building Information Modelling and Management

Master Program

Integrated Management in BIM Course

Integrated Management

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Course Description Document

1. Basic Information:

Integrated Management	Course Name
IM-BIM	Course Code
14	Theory Contact Hours
14	Practical Contact Hours
2	Number of Quizzes
1	Number of Exams
42	Study Hours for Theory Contact
21	Study Hours for Practical Contact
3	Credit Hours

2. Prerequisite Courses

PM, BIM-F

3. Course Objectives

1. **Understanding Integrated Project Management with BIM :** Equip students with the knowledge necessary to understand the principles of integrated project management in the context of Building Information Modeling (BIM), including the role of digital workflows and collaboration platforms in construction projects.
2. **Familiarity with OpenProject BIM Platform :** Enable students to study and navigate the OpenProject BIM platform as an integrated tool for managing construction projects, focusing on its capabilities in planning, scheduling, cost control, and communication.
3. **Mastering Project Planning and Scheduling Using BIM Tools :** Develop students' skills in creating detailed project plans using BIM-integrated tools, including Work Breakdown Structures (WBS), Gantt charts, resource allocation, and risk planning.
4. **Managing Budgets, Time, and Costs in Construction Projects** : Train students to manage project budgets, track time and costs per work package, and generate reports for billing and financial monitoring using BIM-enabled systems such as those aligned with HOAI standards.
5. **Executing Projects and Managing Communication via Digital Dashboards :** Enhance students' abilities to monitor and execute construction tasks using real-time dashboards, communicate effectively with stakeholders, and utilize BCF interfaces for issue tracking and resolution.

6. **Tracking Defects and Managing Changes Throughout the Project Lifecycle :** Develop students' competencies in identifying, logging, assigning, and resolving construction defects, as well as managing change requests efficiently across all phases of a project.
7. **Documenting Project Closure and Providing Feedback for Future Improvements :** Teach students how to prepare final project reports, document lessons learned, analyze failures, and provide valuable feedback to improve future construction projects through post-project evaluations.

4. Learning Outcomes

Number	Desired Learning Outcomes
1	Differentiate between various types of BIM software and project management tools, understand their integration within the construction lifecycle, and apply them to improve collaboration, accuracy, and efficiency in engineering and architectural projects using platforms such as OpenProject, Revit, and IFC viewers.
2	Understand the fundamentals of digital collaboration and data sharing in construction projects, including the use of cloud-based platforms and web technologies to enable real-time communication, file sharing, and access to BIM models among stakeholders across different locations.
3	Master the use of digital communication and issue-tracking tools in construction project management, utilizing features such as the BCF interface, task assignments, and status dashboards within the OpenProject BIM platform to coordinate with team members and manage project workflows effectively.
4	Create and manage comprehensive construction project documentation using BIM-integrated tools, including developing structured work breakdowns, generating reports with schedules, cost estimates, and resource allocations, and preparing professional documentation aligned with industry standards.
5	Analyze construction project data using BIM-enabled planning and scheduling tools, through defining timeframes, allocating resources, tracking progress, forecasting costs, and generating visual reports to support decision-making and risk management throughout the project lifecycle.
6	Prepare and present professional construction project plans and reviews using digital presentation tools integrated with BIM platforms, including creating visual summaries of project phases, inserting model views, charts, timelines, and applying design techniques to deliver clear and impactful presentations for stakeholders.
7	Understand the fundamental concepts of Building Information Modeling (BIM) and its role in modern construction project management, including the use of open standards such as Industry Foundation Classes (IFC), and how BIM supports collaboration, efficiency, and lifecycle management of building projects.

5. Assessment Methods

Chapter Number	Chapter Title	Content	Recorded Lectures	Practical	Interactive Sessions	Final Exam/Quiz	Assessment Methods
(CH1 + CH2)	Introduction to BIM and Integrated Project Management	Understanding the fundamentals of Building Information Modeling (BIM), its role in construction, and how it integrates with modern project management practices. Explore digital workflows, IFC standards, and the benefits of collaborative platforms like OpenProject in managing construction projects across their lifecycle.	√	√	√	√	√
(CH3 + CH4)	BIM Tools and OpenProject Platform	Study different BIM software tools such as Revit, ArchiCAD, and IFC viewers. Understand how they are used across various stages of the construction process. Gain hands-on experience with the OpenProject BIM platform for managing tasks, timelines, resources, and communication.	√	√	√	√	√
(CH5 + CH6)	Project Portfolio & Project Planning	Learn how to manage multiple projects simultaneously using portfolio management tools. Develop skills in defining project scope, creating work breakdown structures (WBS), setting objectives, and aligning stakeholders through OpenProject.	√	√	√	√	√
(CH7 + CH8)	Task Management & Agile, Kanban, Scrum	Master task assignment, tracking, and execution using BIM-integrated tools. Understand and apply agile methodologies such as Kanban and Scrum to manage iterative project phases, especially useful in dynamic or complex construction environments.	√	√	√	√	√
(CH9 + CH10)	Time Tracking & Team Collaboration	Acquire skills in monitoring time spent on tasks and improving productivity. Use team collaboration features in OpenProject to communicate effectively, share files, assign responsibilities, and maintain transparency among all project participants.	√	√	√	√	√
(CH11 + CH12)	Product Map & Workflows	Learn how to create product roadmaps for long-term planning of construction deliverables. Understand and configure automated workflows in OpenProject to streamline approvals, document management, issue resolution, and other repetitive processes.	√	√	√		√

Additional Notes:

- **2 Quizzes:** Two midterm quizzes will be administered during the semester — one after the completion of the introductory and tool-based modules, and another after the planning and collaboration topics. Each quiz evaluates students' comprehension of theoretical and practical content covered up to that point.
- **Final Exam:** Administered once at the end of the semester and lasts for two hours. It assesses students' overall understanding of BIM concepts, project management principles, and the use of the OpenProject platform in construction projects.

6. Course Content

Chapter Number	Chapter Title	Content	Number of Theoretical Units	Number of Practical Units
(CH1 + CH2)	Introduction to BIM and Integrated Project Management	Understanding the fundamental concepts of Building Information Modeling (BIM), its role in construction, and how it integrates with project management principles. Study digital workflows, IFC standards, and the importance of collaborative platforms like OpenProject in managing construction projects across their lifecycle.	2	2
(CH3 + CH4)	BIM Tools and OpenProject Platform	Differentiate between various BIM software tools such as Revit, ArchiCAD, and IFC viewers. Understand their application in different phases of construction. Learn how to use the OpenProject BIM platform for managing tasks, schedules, resources, and communication.	2	2
(CH5 + CH6)	Project Portfolio & Project Planning	Explore how to manage multiple projects using portfolio management tools. Define project scope, create work breakdown structures (WBS), set objectives, and align stakeholders through OpenProject.	2	2
(CH7 + CH8)	Task Management &Agile, Kanban, Scrum	Master task assignment, tracking, and execution using BIM-integrated tools. Apply agile methodologies such as Kanban and Scrum to manage iterative phases of construction projects effectively.	2	1
(CH9 + CH10)	Time Tracking & Team Collaboration	Learn how to monitor time spent on tasks and improve productivity. Use team collaboration features in OpenProject to communicate, share files, assign responsibilities, and ensure transparency among all team members.	2	2
(CH11 + CH12)	Product Map & Workflows	Understand how to create product roadmaps for long-term planning of construction deliverables. Configure automated workflows in OpenProject to streamline approvals, document management, issue resolution, and other repetitive processes.	2	2

7. Practical Section

Tools and Laboratories of the Practical Section

Tool Name	Tool Description	Application
Project Overview	Dashboard providing a summary view of all project activities, timelines, and status	Introduce students to project monitoring and high-level planning
Work Breakdown Structure (WBS)	Breaks down the project into manageable components or tasks	Teach students how to define scope and organize work packages
Gantt Chart	Visual timeline tool for scheduling tasks and tracking progress	Apply time planning and visualize dependencies and critical path
Task Management	Enables creation, assignment, updating, and tracking of individual tasks	Manage construction activities, assign responsibilities to team members
Kanban Boards	Agile visual boards for managing workflows and task statuses	Implement Agile methodologies like Scrum and Kanban in iterative project phases
Time Tracking	Records time spent on each task by team members	Monitor productivity, calculate effort vs. planned time, and improve resource planning
Calendar	Displays scheduled tasks and milestones in a calendar format	Help students manage deadlines and coordinate with stakeholders
Documents Module	Centralized repository for uploading, sharing, and versioning files	Store and share BIM models, reports, drawings, and other project-related documentation
Collaboration & Discussion Forum	Enables real-time communication between team members	Encourage teamwork, feedback, and coordination among distributed teams
Reporting & Dashboards	Generates visual reports based on project data	Evaluate project health, analyze performance, and support decision-making
BCF Integration	Interface for exchanging issues, defects, and comments with BIM models	Track construction defects and align them with 3D model views
User Roles & Permissions	Manages access rights for different stakeholders (e.g., admin, manager, member)	Teach students how to control data access and maintain security in multi-user environments
Workflow Engine	Automates business processes such as approvals, notifications, and reviews	Standardize processes like change requests, document submissions, and QA/QC checks

8.References Used

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