BIM

Building Information Modeling

TIBET

Pathways to your future.

THE INSTITUTE OF BUSINESS, ENGINEERING & TECHNOLOGY

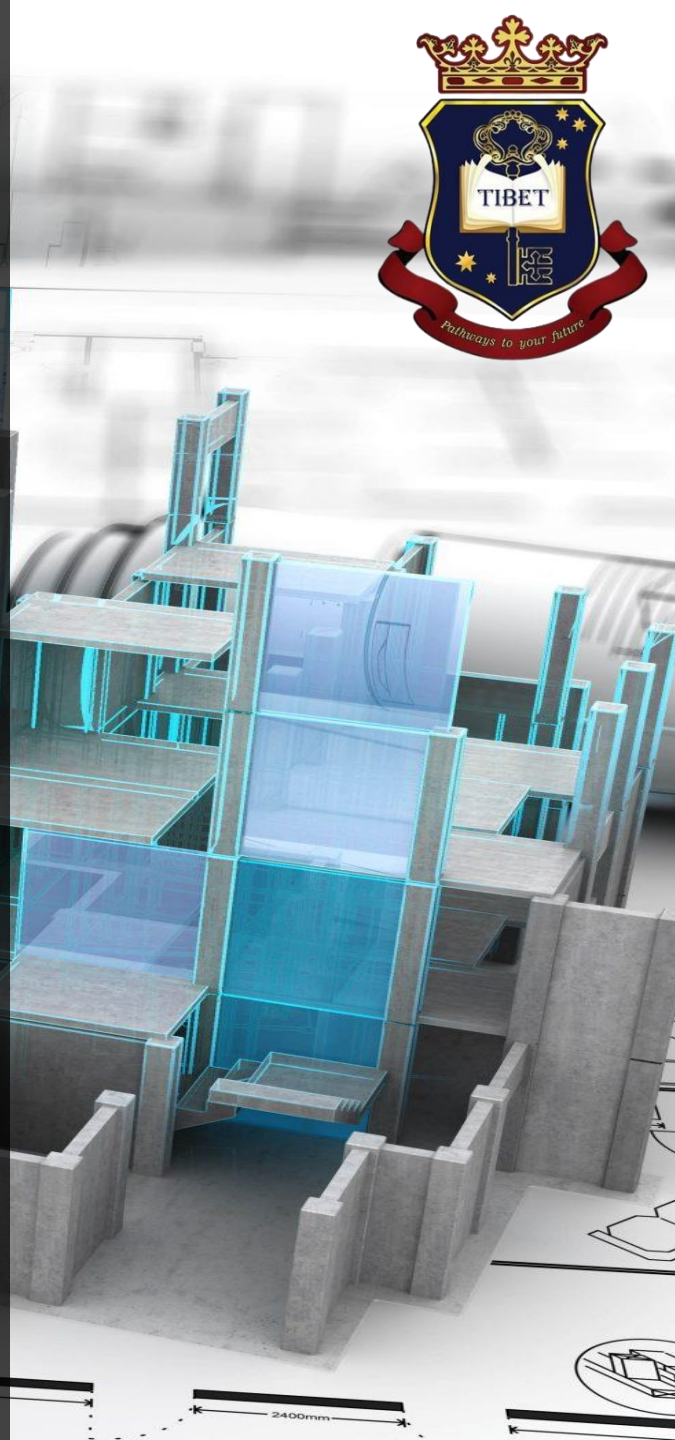
What is BIM

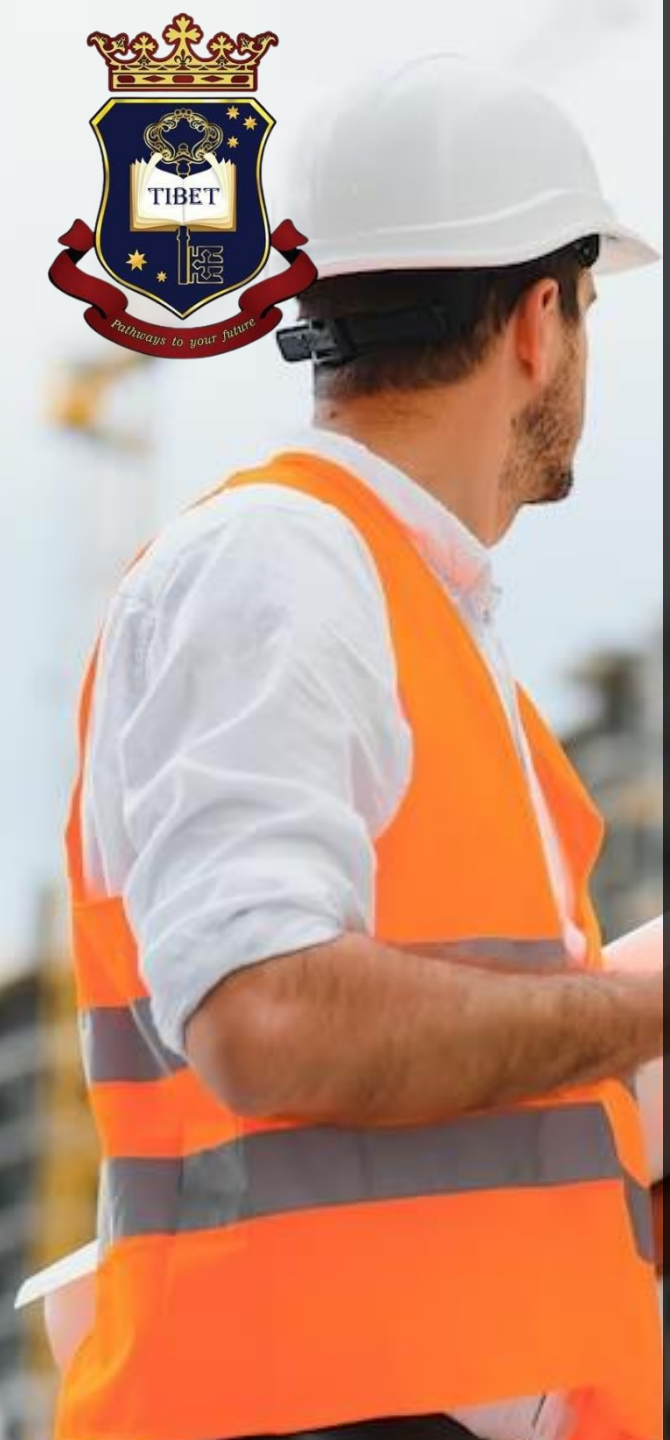
BIM is a process for creating and managing information on a construction project throughout its whole life cycle.

As part of this process, a coordinated digital description of every aspect of the built asset is developed, using a set of appropriate technology.

It is likely that this digital description includes a combination of information-rich 3D models and associated structured data such as product, execution and handover information.

Internationally, the BIM process and associated data structures are best defined in the ISO 19650 and 12006 series of standards.





How can BIM help you?

In the early stages of a BIM project, a collaborative team is assembled. It agrees the process and information structures to ensure that the design information developed is coordinated, and will be of maximum benefit to those involved in the construction and operation stages.

Involvement of those that will be involved at a later stage of the project (such as manufacturers or the client's FM team) can greatly help with this initiation.

As the project enters the construction stage, the information developed can be used to plan and build more efficiently. Where revisions to the design are required, any changes can follow the agreed process in a transparent and recorded way.

Finally, as the construction project is completed and the in-use stage commences, the information that has been modeled can be used to operate the built asset.

Real-time information about the asset's performance is modeled so that certain aspects of the built asset have a 'digital twin' equivalent.

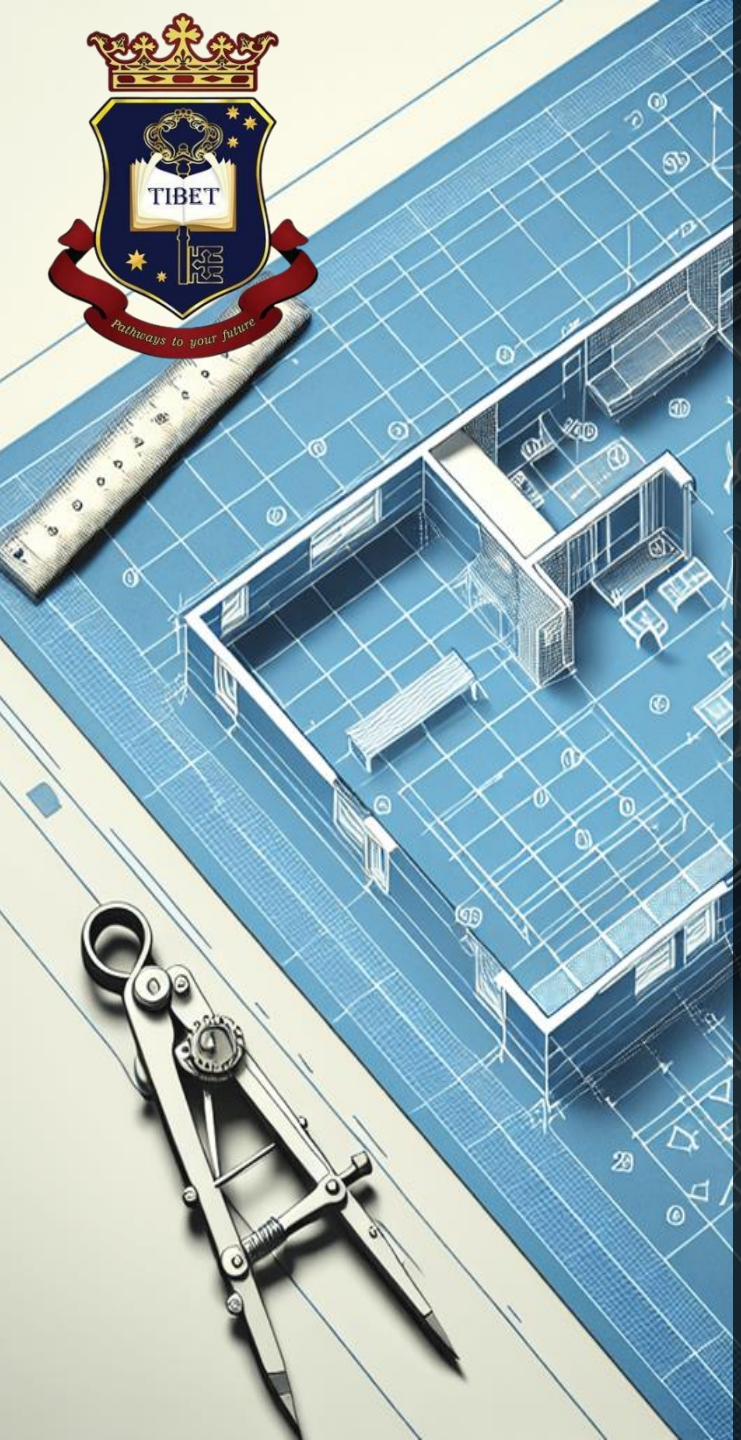
BIM is the gathering of the following three components:

1.Agile development.

2. Lean construction for the building industry.

3. Complete digitalization of building design processes.

BIM is used to improve the efficiency of the construction process, reduce waste during the construction and to improve the quality and the efficiency of the buildings.

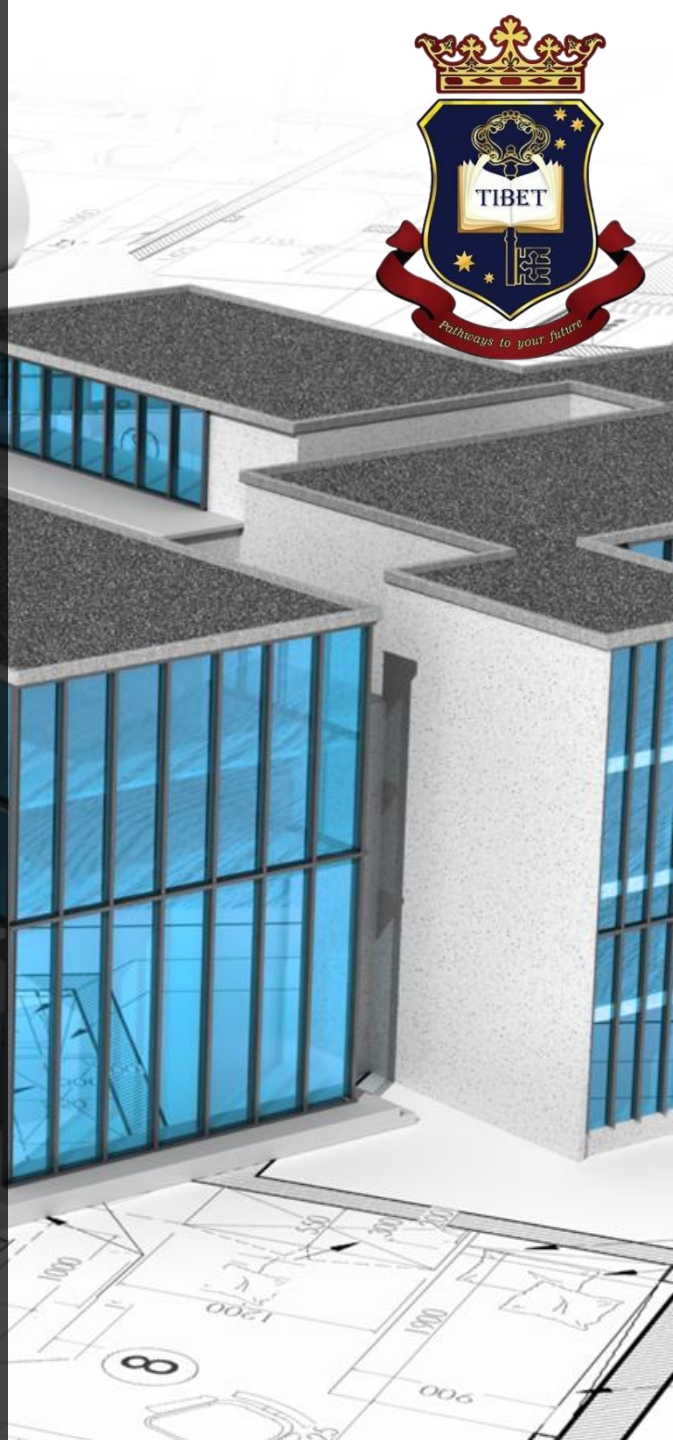


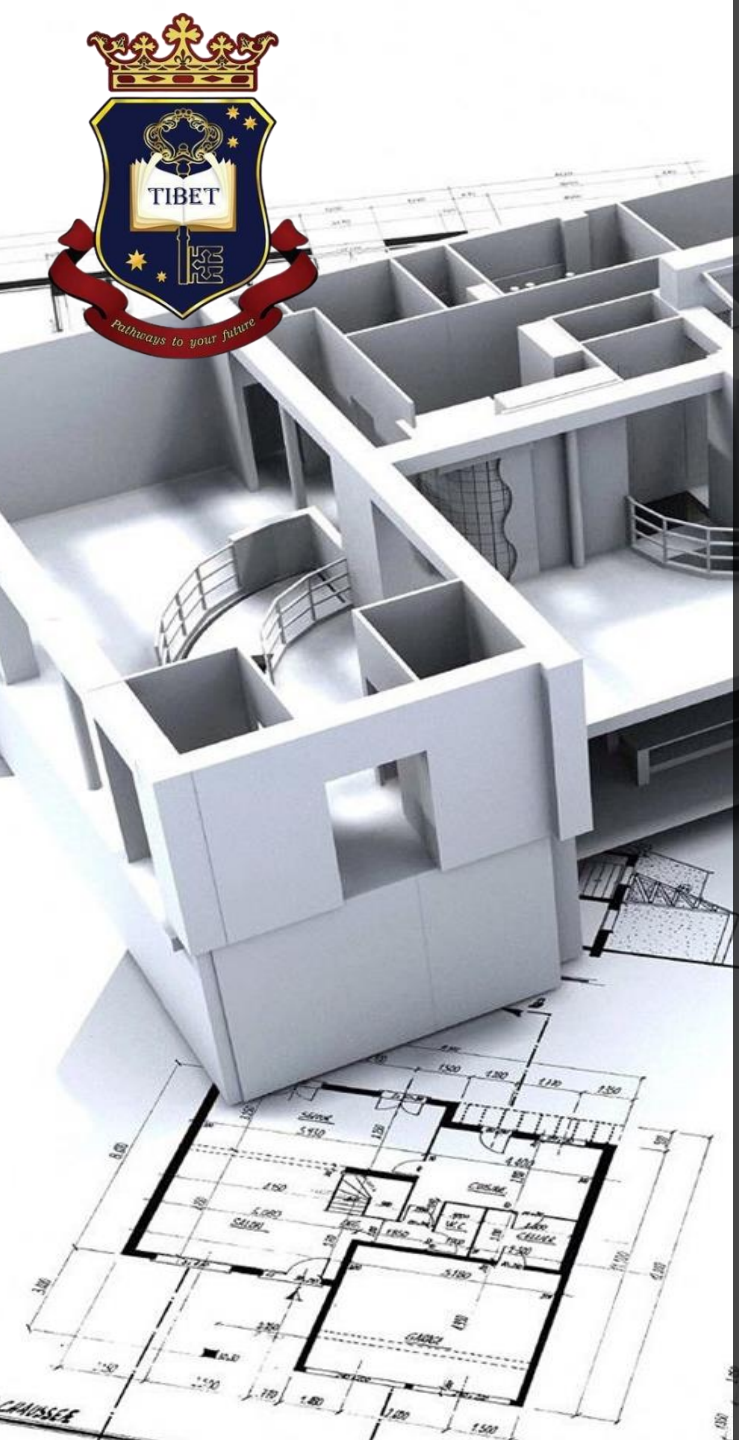
Why adopt BIM?

- Via a rapid exchange of design information, different scenarios can be explored faster, allowing for more iterations of the architecture, structure and engineering systems and resulting in an accurate and optimized building design.
- All drawings can be captured into one comprehensive 3D model, avoiding information loss and enabling more educated decisions based on data.
- Necessary engineering calculations for ventilation, heating and piping systems can be performed quickly and easily. All geometric and spatial data required to perform energy calculations can be produced directly from the model.
- Ensuring compliance with environmental requirements is easier and the increased efficiency helps reduce building lifecycle costs. Integration of cost and scheduling data enables online cost estimation and visualization of the construction progression.
- Accurate Bills of Quantities can be produced directly from the model.
- Data required to control procurement can be linked directly from the model, optimizing the procurement process.
- Detailed model contains all data and geometry required for accurate installation of MEP systems.
- Once the building is completed, the next version of the model will inform facilities management decision-making and systems, allowing for preventative maintenance and repair.

Our BIM Programme

This programme will give participants an understanding of the detailed processes that support and guide construction professionals in the context of Building Information Modelling (BIM). Participants will explore the relevance of BIM in the construction industry and understand how the standards and processes that support BIM will enable better information management across the life of a project. Participants will also explore in detail the relevant changes to existing documentation and information in a project, and how this information is developed across the various stages of a project. There is series of standards that support BIM and students will begin to determine their relevance and utilize them in a BIM process. The knowledge and skills that participants gain in this unit will give them an understanding of the context of BIM in the construction industry and they will be able to relate this to further study or to the realities of today's workplace. Participants will be able to effectively determine the relevance of BIM within the construction industry today and how this may affect future processes.





By the end of this unit, participants will be able to:

Explain the importance of information management in construction projects and how different parties are involved in the BIM process.

- BIM and information management
  - ISO 19650
  - Definitions (e.g., information management, asset, project delivery, asset operation)
- Roles & responsibilities
  - Appointing party (e.g., client, asset owner)
  - Lead appointed party (e.g., main consultant, project manager, information exchange accountability)
  - Appointed party (e.g., information 'generators' – contractor, subcontractor, supplier, consultant)
  - Project team (e.g., everyone involved in the project)
  - Delivery team (e.g., lead appointed party and task teams)
  - Task team(s) (e.g., person or group performing a specific task – design team, curtain wall consultant, steel fabricator)
- Information requirements cycle Define/ Appoint/ Plan/ Deliver/ Check/ Use/ Learn (leading back to define)

Assess the Organizational Information Requirements (OIR) and prepare the Exchange Information Requirements (EIR) for a given project.

- Organizational Information Requirements (OIR)
  - High-level business-related requirements
  - Appointing party organizational objectives (e.g., statement of need)
  - Pre-contract BIM Execution Plan (BEP)
  - Post-contract BIM Execution Plan (BEP)
- Exchange Information Requirements (EIR)
  - Technical information (e.g., software, data exchange formats, level of detail, training requirements)
  - Managerial information (e.g., standards, stakeholders and responsibilities, security, coordination and clash detection, collaboration process, compliance plan, model review, health and safety, data segregation and model management, asset information delivery strategy)
  - Commercial information (e.g., timing of 'data drops', client strategic purpose, BIM project deliverables, BIM competence assessment)

- Common Data Environment (CDE)
  - Relationship to Exchange Information Requirements
  - Information states (e.g., work in progress, shared, published, archived)
  - Metadata (e.g., revision code, status, code, classification)
  - Classification systems (e.g., Uniclass, Omniclass, CI/SfB)
  - Software (e.g., vendors, cloud-based, on-premises)
  - Process (e.g., information sharing, managing revisions, metadata and process management)
  - Role of the information manager

Analyze the relationship between Project Information Requirements (PIR) and the Project Information Model (PIM) for a given construction project

- Project Information Requirements (PIR)
  - High-level project-related requirements
  - Project delivery phase
  - Project scope and business case
  - Strategic brief Key stakeholders Project tasks
  - Key decision points (e.g., project milestones)
  - Decisions required from appointing party at key decision points
  - Information required to enable appointing party to make decisions

Use available data and information to prepare the Asset Information Model (AIM) based on the Asset Information Requirements for a given construction project.

- Asset Information Requirements (AIR)
  - Operational phase
  - Operating costs (e.g., energy use, replacement, repair, maintenance) Management within CDE
  - Relationship to Asset Information Requirements
  - From PIM to AIM
  - The single source of ‘truth’ about a built asset
  - AIM content (e.g., graphical data, non-graphical data, ownership information, rights and restrictions, surveys, work carried out, operational performance information, condition information)
  - Changes to AIM (e.g., event triggers, updating AIM)

Duration: 50 Hours

TIBET CAMPUS

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