Fall 2024

Arch 337-103: Building Information Modeling

Hayyatu-deen Ikharo

ARCH 337-103: Building Information Modeling

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Class Schedule: Every Monday, September 9, 2024- December 9, 2024

Time: 6:00 pm – 8:50 pm

Class Location: West 140

Credits: 3

Instructor: Hayyatu-deen Ikharo

Contact Information: hayyatudeen.ikharo@njit.edu

Office hours: By appointment only

Course Overview

This course introduces students to building information modeling (BIM) using Autodesk Revit within the context of the architecture industry. Students will learn how to design, create, and manage digital representations of both the physical and functional characteristics of spaces. The course covers fundamental Revit tools and techniques, including modeling, documentation, and collaboration.

Learning Objectives

Upon completing the course, students will be proficient in creating 3D computer models according to established industry standards. They will understand the transition from 2D to 3D representations and gain the skills to analyze and extract building information data from a Revit model.

At the end of the course, students will be able to:

- Create building models employing structural grids and support systems.
- Design and integrate essential building components, including levels, floors, and roofs.
- Utilize parametric modeling techniques to enhance 3D design capabilities.
- Incorporate mechanical, electrical, and plumbing (MEP) systems into building models.
- Extract and interpret data from site topography to inform design decisions.
- Produce quality building documentation and specifications.
- Generate high-quality, annotated building section drawings and renderings.

Course Format and Teaching Methods

This course is delivered synchronously in a classroom setting providing students with the opportunity to directly implement newly acquired skills using the BIM software platform. This hands-on approach ensures immediate application and reinforcement of the course material. Quizzes will be administered during each class to help evaluate student progress, and each topic should be practiced outside of class time. This course is organized around a series of both individual and collaborative projects, enabling students to practically apply the principles of Building Information Modeling (BIM)

Academic Integrity

Academic integrity and honesty are of paramount importance at NJSOA. Cheating and plagiarism will not be tolerated. The NJIT Honor Code will be upheld, and any violations will be dealt with by the department or brought to the immediate attention of the Dean of Students. All students are responsible for upholding the integrity of NJIT by reporting any violation of academic integrity. The identity of the student filing the report will remain anonymous. All students are expected to adhere to the University Code on Academic Integrity: Academic Integrity and the Code of Student Conduct: Student Conduct

HCAD librarian Maya Gervits has assembled excellent resources for students use on using images, citing, and plagiarism: Library Resources

Attendance

Students must attend all classes to benefit fully from the course. Attendance is crucial for successful participation and learning. All absences must be reported to the Dean of Students. The Dean's office will determine if an absence is excused and whether an accommodation is necessary. It is the student's responsibility to provide appropriate documentation for review by the Dean. Prompt communication regarding absences is essential to avoid penalties and maintain good standing in the course.

Students with Disabilities:

As an educational institution, our moral, ethical, and legal responsibility is to ensure appropriate accommodations are provided for all students with physical and/or learning disabilities. If you require accommodation related to disabilities, please ensure that all official documentation is submitted to the Dean of Students and the Disability Support Service Office. It is your responsibility to inform the instructor at the beginning of the semester if accommodation is needed.

- Dean of Students: Dean of Students
- Disability Support Service: Disability Support Services

Learning and Teaching Culture Policy

In addition to the overarching values and ethics of the university, the New Jersey School of Architecture (NJSoA) is dedicated to optimism, diversity and solidarity, professional conduct, constructive evaluation and instruction, collaborative community, health and well-being, time management and school-life-work balance, respectful stewardship and space management, and well-rounded enrichment. The pedagogy of architecture and design is as complex as it is rewarding, and as dynamically evolving as the people who learn and teach it. This understanding resides at the core of the NJIT Learning and Teaching Culture Policy: Learning and Teaching Culture Policy.

Generative AI

Student use of artificial intelligence (AI) is permitted in this course. When students use AI in this course, the AI must be cited as is shown within the NJIT Library AI citation page for AI. If you have any questions or concerns about AI technology use in this class, please reach out prior to submitting any assignments.

Kepler/Canvas

Kepler has been integrated into Canvas. All students are required to upload their assignments to the corresponding folders on the Assignments page of Canvas. Please login to Canvas at canvas.njit.edu to access these folders. Further detailed instructions regarding assignment submissions will be provided as needed.

Required Software

This course will use primarily Autodesk Revit, which can be downloaded for free using a student account

Autodesk Revit: Autodesk Revit

Means Of Evaluation

The final grades are broken down as follows:

- Class Participation and Quizzes: 15%
- Assignments (See schedule): 25%
- Midterm Project (Individual): 25%
- Final Project (Group): 35%

Undergraduate Courses Grading Scale

Grade	Description
A	Superior
B+	Excellent
B	Very Good
C+	Good
C	Acceptable
D	Minimum
F	Inadequate
AUD	Audit
I	Incomplete--given in rare instances to students who would normally have completed the course work but who could not do so because of special circumstances. It is expected that coursework will be completed during the next regular semester. If this grade is not removed before final grades are due at the end of the next regular semester, a grade of F will be issued.
W	Withdrawal
S	Satisfactory
U	Unsatisfactory

Recommended Textbook and References

- BIM Handbook: A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers
- LinkedIn Learning: Revit 2024- Essential Training for Architecture

Course Outline and Schedule

Week 1: Introduction to BIM and Revit (September 9, 2024)

- Course overview and expectations
- Introduction to BIM concepts
- Overview of Revit interface
- Basic navigation and toolsets

Week 2: Starting a Project (September 16, 2024)

- Setting up a new project
- Project templates and standards
- Basic project settings
- Creating and modifying levels and grids

Assignment 1 Issued

Week 3: Basic Building Components (September 23, 2024)

- Walls, doors, columns and windows
- Modifying and editing components
- Creating custom families

Assignment 1 Due | Assignment 2 Issued

Week 4: Floors, Ceilings, and Roofs (September 30, 2024)

- Creating and modifying floors
- Adding ceilings and roofs
- Editing profiles and materials

Assignment 2 Due| Assignment 3 Issued

Week 5: Stairs, Ramps, and Railings (October 7, 2024)

- Designing stairs and ramps
- Adding and modifying railings
- Custom stair and railing components

Assignment 3 Due | Assignment 4 Issued

Week 6: Views and Visualization (October 14, 2024)

- Creating and managing views
- Sections and elevations
- 3D views and renderings
- Visualization techniques

Assignment 4 Due | Midterm Project Issued

Week 7: Annotations and Documentation (October 21, 2024)

- Adding dimensions, text, and tags
- Creating schedules and legends
- Detailing and annotation tools
- Midterm project work session

Week 8: Midterm Project Review (October 28, 2024)

- Midterm project presentations
- Peer review and feedback
- Instructor critique

Midterm Project Due

Week 9: Worksharing and Collaboration (November 4, 2024)

- Introduction to Worksharing in Revit
- Setting up and managing Worksets
- Collaborating in a team environment

Assignment 5 Issued

Week 10: Site Design and Topography (November 11, 2024)

- Creating and modifying topographic surfaces
- Adding site components
- Site analysis tools

Assignment 5 Due | Assignment 6 Issued

Week 11: Advanced Modeling Techniques (November 18, 2024)

- Complex modeling and massing
- Creating custom components
- Advanced family creation

Assignment 6 Due | Final Project Issued

Week 12: MEP and Structural Integration (November 25, 2024)

- Introduction to MEP and structural components
- Coordination and clash detection
- Integrating architectural and engineering models

Week 13: Final Project Work Session (December 2, 2024)

- In-class work session for final projects
- Individual consultations with the instructor
- Peer collaboration and feedback

Week 14: Final Project Presentations (December 9, 2024)

- Final project presentations
- Peer review and critique
- Instructor feedback

Final Project Due*

Note: This syllabus is subject to change as the course progresses and any unforeseen circumstances. All changes will be communicated in advance.

**- Subject to change.*