

ITT Technical Institute

DT1320

Building Information Modeling (BIM)

Onsite and Online Course

SYLLABUS

Credit hours: 4.5


Contact/Instructional hours: 56 (34 Theory Hours, 22 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisites: DT1230 CAD Methods or equivalent

Course Description:

This course examines architectural planning and design utilizing Building Information Management (BIM) techniques. Fundamental design methods and practices for the creation of architectural drawings are presented, with emphasis on the content of the drawings and the production skills. Topics include the development of floor plans, elevations and sections of building projects.



COURSE SUMMARY

COURSE DESCRIPTION

This course examines architectural planning and design utilizing Building Information Management (BIM) techniques. Fundamental design methods and practices for the creation of architectural drawings are presented, with emphasis on the content of the drawings and the production skills. Topics include the development of floor plans, elevations and sections of building projects.

MAJOR INSTRUCTIONAL AREAS

1. BIM Revit Interfaces and File Types
2. Drafting Requirements
3. Computer-Aided Drafting (CAD)
4. Construction Methods and Materials
5. Building Codes
6. Modeling Basics
7. Modifying Elements
8. Extended Modeling
9. Setting Up Views
10. Floor Plans and Architectural Details
11. Schedules
12. Printing Documents for Clients

COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Explain BIM and its approach to the design, analysis, and documentation of buildings.
2. Compare and contrast BIM and traditional drafting and design techniques.
3. Communicate general design ideas and concepts through specific working drawings.
4. Apply local zoning ordinances and building codes to an architectural project.
5. Create, explain, and complete a set of working drawings for an architectural project.

6. Solve a design problem through the creation of a Building Information Model in Revit Architecture.

COURSE OUTLINE

MODULE 1: INTRODUCTION TO BUILDING INFORMATION MODELING

COURSE LEARNING OBJECTIVES COVERED

- Explain BIM and its approach to the design, analysis, and documentation of buildings.
- Compare and contrast BIM and traditional drafting and design techniques.
- Apply local zoning ordinances and building codes to an architectural project.

TOPICS COVERED

- BIM and Revit
- BIM Considerations
- Creation of Models in Revit
- Basic Revit Tools

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Wakita, O. A., Bakhoun, N. R., and Linde, R. M., Chapter 1 (pp. 13–16) and Chapter 3.	No	2.5 hrs.
Reading: Wing, E., Chapter 1.	No	1 hr.
Lesson: Study the lesson for this module.	No	1.5 hrs.
Discussion: Participate in the discussion titled “Hand-Drafting versus CAD versus BIM.”	Yes	N/A
Analysis: Submit the analysis titled “Analyzing Building Codes and ADA.”	Yes	3 hrs.
Quiz: Prepare for Quiz 1.	No	1 hr.
Project: Read and begin the project.	No	0.5 hr.

Total Out-Of-Class Activities: 9.5 Hours

MODULE 2: MODELING BUILDING ELEMENTS

COURSE LEARNING OBJECTIVES COVERED

- Communicate general design ideas and concepts through specific working drawings.
- Create, explain, and complete a set of working drawings for an architectural project.
- Solve a design problem through the creation of a Building Information Model in Revit Architecture.

TOPICS COVERED

- Creating Views in Revit
- Creating a Floor Plan
- Creating a Roof Frame

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Wakita, O. A., Bakhoun, N. R., and Linde, R. M., Chapters 8 and 9.	No	5 hrs.
Reading: Wing, E., Chapters 2, 3, 4, 6, 7, and 9.	No	13.5 hrs.
Lesson: Study the lesson for this module.	No	1.5 hrs.
Discussion: Participate in the discussion titled “Essential Elements of a Floor Plan.”	Yes	N/A
Lab 1: Complete the lab titled “Beginning Creation in Revit.”	Yes	N/A
Lab 2: Complete the lab titled “Drafting Roofs and Foundation Using Revit.”	Yes	N/A
Quiz: Take Quiz 1.	Yes	N/A
Quiz: Prepare for Quiz 2.	No	1 hr.
Project: Continue work on Project Part 1.	No	1 hr.

Total Out-Of-Class Activities: 22 Hours

MODULE 3: CREATING SECTIONS AND SCHEDULES

COURSE LEARNING OBJECTIVES COVERED

- Communicate general design ideas and concepts through specific working drawings.
- Apply local zoning ordinances and building codes to an architectural project.
- Create, explain, and complete a set of working drawings for an architectural project.
- Solve a design problem through the creation of a Building Information Model in Revit Architecture.

TOPICS COVERED

- Building Sections
- Adding Structural Items
- Creating Schedules

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Wakita, O. A., Bakhoum, N. R., and Linde, R. M., Chapters 10 and 12.	No	3.5 hrs.
Reading: Wing, E., Chapters 8 and 11.	No	6 hrs.
Lesson: Study the lesson for this module.	No	2 hrs.
Lab: Complete the lab titled "Adding Doors and Windows."	Yes	N/A
Analysis: Submit the analysis titled "Developing Sections and Schedules Using Revit."	Yes	3 hrs.
Quiz: Take Quiz 2.	Yes	N/A
Quiz: Prepare for Quiz 3.	No	1 hr.
Project: Submit Project Part 1.	Yes	5 hrs.

Total Out-Of-Class Activities: 20.5 Hours

MODULE 4: MODELING INTERIOR DETAILS

COURSE LEARNING OBJECTIVES COVERED

- Communicate general design ideas and concepts through specific working drawings.
- Apply local zoning ordinances and building codes to an architectural project.
- Create, explain, and complete a set of working drawings for an architectural project.
- Solve a design problem through the creation of a Building Information Model in Revit Architecture.

TOPICS COVERED

- Creating Ceilings and Interiors
- Adding Stairs and Ramps
- Adding Details

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Wakita, O. A., Bakhoun, N. R., and Linde, R. M., Chapters 11 (pp. 390–402) and 13.	No	5 hrs.
Reading: Wing, E., Chapters 10, 12, and 15.	No	12.5 hrs.
Lesson: Study the lesson for this module.	No	2 hrs.
Discussion: Participate in the discussion titled “Elements of a Design Plan.”	Yes	N/A
Lab: Complete the lab titled “Creating Interior Elements.”	Yes	N/A
Analysis: Submit the analysis titled “Adding Specific Details.”	Yes	2 hrs.
Quiz: Take Quiz 3.	Yes	N/A
Quiz: Prepare for Quiz 4.	No	1 hr.
Project: Begin work on Project Part 2.	No	1 hr.

Total Out-Of-Class Activities: 23.5 Hours

MODULE 5: MODELING EXTERIOR STRUCTURAL ELEMENTS

COURSE LEARNING OBJECTIVES COVERED

- Communicate general design ideas and concepts through specific working drawings.

- Create, explain, and complete a set of working drawings for an architectural project.
- Solve a design problem through the creation of a Building Information Model in Revit Architecture.

TOPICS COVERED

- Site Analysis and Plan
- Topography Map

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Wakita, O. A., Bakhoum, N. R., and Linde, R. M., Chapters 7 and 11 (pp. 365–390).	No	6 hrs.
Reading: Beihler, J. and Fane, B., Chapters 1 and 2.	No	1.5 hrs.
Reading: Wing, E., Chapter 18.	No	2 hrs.
Reading: ITT Tech Virtual Library> Basic Search> Mastering Autodesk Revit Architecture 2015> Chapter 8.	No	1 hr.
Lesson: Study the lesson for this module.	No	1.5 hrs.
Lab 1: Complete the lab titled “Adding Exterior Elevations.”	Yes	N/A
Analysis: Submit the analysis titled “Creating Doors and Windows Schedules.”	Yes	3.5 hrs.
Lab 2: Complete the lab titled “Mass-Modeling in Revit.”	Yes	N/A
Quiz: Take Quiz 4.	Yes	N/A
Project: Continue work on Project Part 2.	No	7 hrs.

Total Out-Of-Class Activities: 22.5 Hours

MODULE 6: PRESENTING AND MANAGING A BIM PROJECT

COURSE LEARNING OBJECTIVES COVERED

- Apply local zoning ordinances and building codes to an architectural project.
- Create, explain, and complete a set of working drawings for an architectural project.
- Solve a design problem through the creation of a Building Information Model in Revit Architecture.

TOPICS COVERED

- Creating Sheets and Printing Plans
- Rendering and Presenting Plans

MODULE LEARNING ACTIVITIES	GRADED	OUT-OF-CLASS TIME
Reading: Wing, E., Chapters 14 and 19.	No	4.5 hrs.
Lesson: Study the lesson for this module.	No	1 hr.
Lab: Complete the lab titled "Creating Views in Revit."	Yes	N/A
Project: Submit Project Part 2.	Yes	1.5 hrs.

Total Out-Of-Class Activities: 7 Hours

EVALUATION AND GRADING

EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

Category	Weight
Analysis	15%
Lab	30%
Quiz	15%
Discussion	10%
Project	30%
TOTAL	100%

GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

Grade	Percentage
A (4.0)	90–100%
B+ (3.5)	85–89%
B (3.0)	80–84%
C+ (2.5)	75–79%
C (2.0)	70–74%
D+ (1.5)	65–69%
D (1.0)	60–64%
F (0.0)	<60%

LEARNING MATERIALS AND REFERENCES

REQUIRED RESOURCES

COMPLETE TEXTBOOK PACKAGE

- Wing, E. (2014). *Autodesk revit architecture 2015: No experience required*. Hoboken, NJ: Wiley.
- Wakita, O.A., Bakhoun, N.R., and Linde, R.M. (2011). *The professional practice of architectural working drawings* (4th ed.). Hoboken, NJ: Wiley.
- Beihler, J. and Fane, B. (2014). *3D printing with Autodesk: Create and print 3D objects with 123D, AutoCAD and Inventor*. Indianapolis, IN: Que Publishing.

RECOMMENDED RESOURCES

- ITT Tech Virtual Library (accessed via Student Portal | <https://studentportal.itt-tech.edu>)
 - Basic Search>
 - Ching, F. (2014). *Building construction illustrated*. Hoboken, N.J. Wiley.
 - Deutsch, R. (2011). *BIM and integrated design strategies for architectural practice [electronic resource]* Randy Deutsch. Hoboken, N.J. Wiley.
 - Levy, F. (2012). *BIM in small-scale sustainable design*. Hoboken, NJ: Wiley.
- Other References
 - ADA.gov
http://www.ada.gov/regs2010/2010ADAStandards/2010ADAStandards_prt.pdf
 - Autodesk.com
<http://www.autodesk.com/>
 - From Revit to 3D Print in 75 minutes and under a grand!
http://paulaubin.com/downloads/2014_RTC/3D-Print-Handout.pdf
 - National Institute of Standards and Technology
<http://fire.nist.gov/bfrlpubs/fire04/PDF/f04031.pdf>
 - 3D printing and the future of manufacturing
http://assets1.csc.com/innovation/downloads/LEF_20123DPrinting.pdf

INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, use of technology, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as guided draft creations and ungraded discussions. Your progress will be regularly assessed through a variety of assessment tools including discussions, analyses, labs, quizzes, and a project.

OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

ACADEMIC INTEGRITY

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic honesty policies, refer to the Student Handbook and the School Catalog.

INSTRUCTOR DETAILS

Instructor Name	
Office Hours	
Contact Details	

(End of Syllabus)