



**BCN 4255C Building Information Modeling
Course Syllabus
Fall 2021**

INSTRUCTOR

Lufan Wang

Lectures: Online LIVE, synchronous sessions Wednesdays 5:00 PM – 6:15 PM

Class Room: Virtual – Zoom link will be posted on Canvas

E-mail: lufwang@fiu.edu

Office Hours: By appointment (email to schedule)

Course Time Zone | Eastern Standard Time (EST). Course due dates are according to this time zone.

COURSE WEBSITE

FIU Canvas will be used in this course (<https://canvas.fiu.edu/>). All the lecture notes, references, assignments, etc., will be posted on FIU Canvas.

COURSE LEARNING OUTCOMES

This course is targeted to introduce and explore the application of Building Information Modeling (BIM) both as a product and a process.

BIM is a new approach to building project delivery in which a digital representation of the building process is used to facilitate the exchange and interoperability of information. Successful implementation of BIM generates significant benefits, including improved design quality, reduction in design errors, improved field productivity, reduction in conflicts and their associated changes, and finally reduction in construction cost and time.

This course will explore BIM from both perspectives of technology and the building practice. Upon completion of this course, students will have full understanding of BIM concepts and the state-of-the-art applications used today throughout the lifecycle of a building or an infrastructure project in the Architecture, Engineering and Construction (AEC) Industry. Particularly, at the end of this course, students will able to:

- Identify BIM workflow in the building and infrastructure lifecycle
- Use BIM for design development and coordination
- Use BIM for construction scheduling and 4D (3D + time) simulation
- Perform system clash prevention using BIM
- Conduct model-based quantity take-off and cost estimation using BIM
- Identify future applications of BIM and artificial intelligence in construction

PRE-REQUISITES

BCN 2253 Building Construction Drawing, BCN 3611 Construction Cost Estimating I, and BCN 3720 Construction Scheduling I.

SUGGESTED READINGS

No textbook is required for this class. Below is a list of suggested readings.

- [1] Eastman, C., Teicholz, P., Sacks, R., and Liston, K. (2011). *BIM handbook: A guide to building information modeling for owners, managers, designers, engineers and contractors* (2nd Edition).
- [2] Hardin, B., and McCool, D. (2015). *BIM and construction management: proven tools, methods, and workflows*.
- [3] *Journal of Building Information Modeling*. An official free publication of the National Institute of Building Sciences (NIBS) which provides essential information on business, standards and technical issues related to BIM.
- [4] *Engineering News Record (ENR)*. The most widely read trade magazine for the architecture/engineering/construction industry. All issues of ENR are posted on <http://www.enr.com>.
- [5] BIM Forum - <http://www.bimforum.org/>
- [6] Analysis, Research and Reviews of AEC Technology: AECbytes - <http://www.aecbytes.com/>

UNIVERSITY POLICIES

FIU's policies and procedures are important to the quality of your education. Please review the FIU website and Student Handbook for information and guidelines relevant to all courses at FIU. The items below are of particular concern for this course, but complete information can be found using additional FIU student resources.

Student Code of Standards

Please review the [FIU's Policies and Netiquette](#) webpage. The policies webpage contains essential information regarding guidelines relevant to all courses at FIU, as well as additional information about acceptable netiquette for online courses.

As a member of the FIU community you are expected to be knowledgeable about the behavioral expectations set forth in the [FIU Student Code of Conduct](#).

Accessibility and Accommodation

The Disability Resource Center collaborates with students, faculty, staff, and community members to create diverse learning environments that are usable, equitable, inclusive and sustainable. The DRC provides FIU students with disabilities the necessary support to successfully complete their education and participate in activities available to all students. If you have a diagnosed disability and plan to utilize academic accommodations, please contact the Center at 305-348-3532 or visit them at the Graham Center GC 190.

For additional assistance please contact FIU's [Disability Resource Center](#).

Academic Misconduct

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly to demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.

Academic Misconduct includes: **Cheating** – The unauthorized use of books, notes, aids, electronic sources; or assistance from another person with respect to examinations, course assignments, field service reports, class recitations; or the unauthorized possession of examination papers or course materials, whether originally authorized or not. **Plagiarism** – The use and appropriation of another’s work without any indication of the source and the representation of such work as the student’s own. Any student who fails to give credit for ideas, expressions or materials taken from another source, including internet sources, is responsible for plagiarism.

Learn more about the [academic integrity policies and procedures](#) as well as [student resources](#) that can help you prepare for a successful semester.

COURSE ORGANIZATION

Course Communication

Communication in this course will take place via the **Canvas Inbox**. Check out the [Canvas Conversations Tutorial](#) or [Canvas Guide](#) to learn how to communicate with your instructor and peers using Announcements, Discussions, and the Inbox. I will respond to all correspondences within 24 hours.

Lectures

The course materials will be taught through a series of lectures and discussions. Lectures are scheduled for Wednesdays from 5:00 PM to 6:15 PM. Lectures are always held over Zoom (link will be posted on Canvas). Please refer to the Course Schedule section for more information. Lecture time will be used for teaching course materials, class discussions, invited guest lectures, and hands-on sessions.

This is an Online LIVE course, which means 50% of the course work will be conducted online, and another 50% are conducted synchronously through our weekly zoom meetings. Expectations for performance in an Online LIVE course are the same for a traditional course. In fact, online courses require a degree of self-motivation, self-discipline, and technology skills which can make these courses more demanding for some students.

Guest Lectures

Throughout the semester, guest lecturers from leading Architecture/ Engineering/ Construction and Facility Management (AEC/FM) firms will provide us with a practical perspective on the

benefits and challenges of using BIM. As part of these guest lecture series, the technical and business process requirements that are required for successful implementation of BIM on actual building projects will be discussed with real-world examples. Each guest lecture will focus on specific step in the life cycle of a project and will detail real-world application of BIM and discuss their value from the perspective of the practitioners.

Class Participation and Hands-on Exercises

Class attendance is mandatory. Active participation through sharing of experiences, questions, and comments is expected and encouraged. Students should expect to be assigned quick individual/group tasks during class. Absence from class may result in the loss of attendance points. It is recommended for students who are able to anticipate an absence to notify the instructor in advance. Hands-on exercises/sessions will be used to help students learn the various BIM-based software applications, including but not limited to Autodesk Revit Architecture 2021 and Autodesk Navisworks Manage 2021. The materials needed for these sessions will be posted on Canvas. Please refer to the Course Schedule section for more information on the hands-on exercises/sessions.

Software Applications

This course will use several BIM software applications which can be downloaded for free by using STUDENT account:

- Autodesk Revit: <http://www.autodesk.com/education/free-software/revit>
- Autodesk Navisworks: <http://www.autodesk.com/education/free-software/navisworks>

More information about the software applications will be shared on Canvas.

Please note that the BIM software requires a Windows environment. If you are using a Mac, please access the software through EICApps.

Assignment

Five homework assignments will be assigned by the instructor over the course of the semester;

- All assignments will be posted on the FIU Canvas on the hand-out date;
- All assignments are due at mid-night (11:59 pm) on the due date;
- All assignments need to be submitted through FIU Canvas;
- Late assignments will receive a mark deduction of 10% per day (including Saturdays and Sundays);
- All assignments are individual work. **No group work** is allowed.

Term Project

Please refer to the term project handout.

Grading Scheme

Course Requirements	Number of Items	Weight
Class participation	14	10%
Quizzes	5	10%

Assignments	5	50%
Term project	1	30%
Total	25	100%

All grades will be determined pursuant to the following point values:

Letter Grade	Range	Letter Grade	Range	Letter Grade	Range
A	93.0 & Above	A-	90.0 - 92.9	B+	87.0 - 89.9
B	84.0 - 86.9	B-	81.0 - 83.9	C+	77.0 - 80.9
C	70.0 - 76.9	D	60.0 – 69.9	F	59.9 & Below

Course Schedule (Tentative)

BCN 4255C Building Information Modeling - Spring 2021		
Session	Date	Topic
1	8/25/21	Course Introduction & Overview Introduction to BIM
2	9/01/21	BIM for Design Development
3	9/08/21	Hands-on #1: 3D Modeling
4	9/15/21	BIM and Integrated Project Delivery
5	9/22/21	Hands-on #2: BIM for Construction Coordination
6	9/29/21	Guest Speaker #1 BIM for System Clash Prevention
7	10/06/21	Hands-on #3: Clash Detection
8	10/13/21	Guest Speaker #2 BIM for 4D Simulations
9	10/20/21	Hands-on #4: Simulating and Visualizing 4D BIM
10	10/27/21	Guest Speaker #3 BIM for Cost Estimation
11	11/03/21	Hands-on #5: Cost Estimation Using BIM
12	11/10/21	nD BIM: BIM for Reality Capture, Energy Modeling with BIM, BIM for Code Checking, etc.
13	11/17/21	From BIM to CIM The Future of BIM
14	12/01/21	Final Project Presentation

Right to Revise

While the overall design of this course is firmly established, specific tasks, dates and components are subject to change as the need arises. The instructor reserves the right to make revisions to any item in this syllabus, including, but not limited to any of the items mentioned in the notes above. Such changes, communicated clearly, are not unusual and should be expected.