Course Details

Credits: 3
Lecture Time: Tuesdays, 5:10 PM- 8:10 PM (Periods 10-E1)

Contact Information

Course Instructor: Dr. R. Raymond Issa
Office: RNK 325
E-mail: raymond-issa@ufl.edu
Office Hours: By appointment

Course Expectations

Pre-Requisites

BCN3255 - Computer Graphic Communications, *or consent of professor (based on previous experience with BIM or 3D modeling in another related discipline)*

Course Description

This course will cover the fundamental principles and practices of Building Information Modeling (BIM) and Virtual Design and Construction (VDC). Additional lectures may also be supplemented to present the use of information systems in the construction context.

Course Method

Teaching methodology will consist of weekly online tutorials/classes which will present the basic practice of using a variety of BIM software tools including, but not limited to: Autodesk Revit, Navisworks Manage, BIM 360, Assemble Systems, and ReCap Pro and Bentley Synchro. All classwork material can be found on the course Canvas site.

Course Objectives

1. To be able to create functional 3D models, with all the necessary embedded information, based on construction documentation.
2. To be able to evaluate 3D models to determine both modeling quality and reporting accuracy.
3. To be able to visualize and communicate construction concepts using 2D and 3D applications.
4. To be able to demonstrate skills related to creating, analyzing and implementing multi-dimensional Building Information Models to solve construction problems.

Required Software

You are required to install the following software on your personal computers:

1. Autodesk Software available through the Autodesk Education Community
   http://www.autodesk.com/education/home
   a. Create a free account, using your ufl.edu account, and download the following software,
      i. Revit 2021
      ii. Navisworks Manage 2021
      iii. Recap Pro 2021

2. Autodesk BIM 360 Platform
    a. Access to the following online platforms will be provided by the instructor at the start of the semester and access will be removed following the end of the semester,
        i. BIM 360 Glue (https://b4.autodesk.com/desktop/)
        ii. BIM 360
3. Synchro Pro
    a. Request a student version from https://www.synchroltd.com/about/university-program/

Recommended Tutorials

- Revit 2021 Essential Training for Architecture
- Revit 2021 Essential Training for Structure
- Revit 2021 Essential Training for MEP
- Navisworks Essential Training
- Synchro Essential Training
- Recap Workflow for Reality Capture

Grading Criteria

Assignments

The assignments in this class are designed to reinforce the basic modeling and analysis principles learned and are a chance for you to apply modeling skills to a project of simple scope. All assignments are <u>individual</u>. Students are encouraged to review the comments left by the instructor on their submission and are asked to fix major problems before starting the next assignments. Most assignments are dependent upon previous assignments. Students are expected to submit their assignments by the due date. **Failure to comply will result in 10 % of the assignment grade deducted for every day the assignment is late.** You can only submit up to three days late.

Group Project

The class will be assigned to groups created by the instructor based on previous modeling skill level. Each group will be assigned to construct a multi-disciplinary federated model of a building using available as-built documentation and specifications. Students are expected to show the progress of their work during each class session. Three major reviews are scheduled during the semester. These reviews will be graded as part of the group project grade. **Failure to submit the project by the due date will result in 25 % of the project grade deducted from the final project score.**

Cumulative Test

The cumulative test in this course is intended to be an opportunity for you demonstrate the skills you have acquired over the course of the semester. There will be no make-up exams, except for a documented need previously discussed with and approved by the course instructor. **Failure to be present for the cumulative exam will result in a failing grade.**

Grade Distribution

The grade of the class is computed based on the following table,

Description	Percentage of Final Grade
Lab Assignments	40%
Group Project	30%

Cumulative Test	30%	
Total	**100%**	

The letter grades will be computed according to the following scale,

A	90.0 and above	C	70.0 to 76.9
A-	87.0 to 89.9	C-	67.0 to 69.9
B	80.0 to 86.9	D	60.0 to 66.9
B-	77.0 to 79.9	E	Below 60

Attendance

As this is a graduate level course, attendance is not mandatory. The exception to this policy is during the days of in-class exercises or presentations in which your attendance is required to receive a grade. Furthermore, all students are expected to be responsible for the material taught and posted on Canvas. The course schedule is very rigorous given the amount of software to be covered. Therefore, failure to attend class may result in students falling behind.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students on the Gator Evals page.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the [Notification to Students of FERPA Rights](#).

Campus Resources:

Health and Wellness

U Matter, We Care:
If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: [counseling.ufl.edu/cwc](#), and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.
University Police Department at 392-1111 (or 9-1-1 for emergencies), or [police.ufl.edu](#).

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling.
Library Support, Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints Campus
On-Line Students Complaints

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Week	Course Topic	Assignment Due (By 5:00 pm)
1	**Course Overview:** Syllabus and schedule review Introduction to Virtual Design and Construction (VDC) Overview of the required software **Revit Overview:** Interface overview Work sets, phases, view range, and visibility graphics Grids and levels	
2	**Architectural Modeling in Revit:** Placing and editing walls (basic walls, curtain walls, stacked walls) Placing and editing floors, shaft openings, and ceilings	**Assignment 0:** Resume Submission
3	**Architectural Modeling in Revit:** Placing and editing windows, doors, roofs, stairs, and ramps	
4	**Architectural Modeling in Revit:** Placing topography and site components Using generic models and massing **Documentation in Revit:** Placing annotations and rooms Creating key plans Creating sheets	
5	**Structural Modeling in Revit:** Linking multiple Revit files and monitoring files Placing and editing foundations, columns, beams, and beam systems	**Assignment 1:** Architectural Model
6	**Structural Modeling in Revit:** Placing and editing trusses Placing and editing reinforcement Placing and editing steel connections Creating drafting views	**Project Distributed**
7	**Mechanical Modeling in Revit:** Overview and setup of system types Placing and editing air terminals, VAVs, and mechanical equipment Placing and editing ductwork, horizontal and vertical connections	**Assignment 2:** Structural Model

Week	Course Topic	Assignment Due (By 5:00 pm)
8	**Plumbing Modeling in Revit:** Plumbing overview and setup of system types Placing plumbing fixtures and mechanical equipment Connecting fixtures with piping	**Project BEP Review** **Assignment 3:** Mechanical Model
9	**Electrical, Fire Protection, and Plumbing Modeling in Revit:** Placing electrical and technology components Drawing fire protection pipes	**Assignment 4:** Plumbing Model
10	**Quantification:** Creating schedules in Revit Creating material takeoff in Revit Quantification in Navisworks Quantification in Assemble Systems	**Project: Architecture Review**
11	**Animations and 4D Simulations** Creating 4D simulations in Navisworks Creating 4D simulations in Synchro Creating animations in Navisworks Creating animations in Lumion	**Assignment 5:** Quantification
12	**Clash Detection** File setup in Navisworks Creating clash tests and analyzing results Coordination meetings, in-class exercise	**Assignment 6:** Animations **Project: Structure Review**
13	**Reality Computing:** Introduction to laser scanning Registering scans in Recap Using point clouds in Revit Introduction to Unmanned Aerial Systems Introduction to photogrammetry	**Assignment 7:** Coordination
14	**Other VDC Technologies:** Autodesk Point Layout Virtual and augmented reality **Review:** Final project review Cumulative test review Autodesk certification review	**Project: Mechanical Review**
15	Group projects due at 11:59 pm	
	Group project presentations during class time	
	Cumulative Test from 9:00 am till 12:00 pm (tentative)	

This schedule is tentative and will be adjusted as necessary based on student progress in grasping the subjects covered.