BCN6785: Construction Information Systems

Course Instructor: Dr. R. Raymond Issa
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Office Hours: By appointment
Lecture Time: Tuesdays 5:10 PM- 8:00 PM (Periods 10-E1) **Room:** RNK 206
Pre-Requisites: BCN3255- computer graphic communications or previous experience with BIM or 3D modeling in another related discipline.

Recommended Texts:

Autodesk Revit Architecture, Structure, and MEP 2012, Navisworks Manage training manuals, user guides, and datasets to supplement lab tutorials.

Eastman, C. et al. (2008). *BIM Handbook: a guide to building information modeling for owners, managers, designers, engineers, and contractors,* Wiley, New Jersey.

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

II. **Course Method:** Teaching methodology will consist of weekly hands-on tutorials in the computer lab which will present the basic practice of using a variety of BIM software tools including: Revit Architecture, Structure, and MEP; Autodesk QTO; and Autodesk Navisworks Manage.

III. **Objectives:**

1. To be able read and interpret construction documentation and create an accurate and functional 3D model.
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 BIMs to solve construction problems.

IV. **Grading Criteria**:

- 6 Lab Assignments 30% (300 points/ 50 points each)
- Group Project 40% (400 points)
- Final Exam 30% (300 points)

The 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

V. **Attendance**

As this is a graduate level course, attendance is not mandatory. However, all students are expected to be responsible for the material taught during the lab period. 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.

VI. **Assignments**:

There will be a total of six assignments to be completed throughout the course. Each is worth 5% of your final grade. These assignments are designed to reinforce the basic modeling and analysis principles learned in the previous lab period and are a chance for you to apply modeling skills to a small project of simple scope. All assignments must be completed INDIVIDUALLY and submitted on the course website before the class begins.

VII. **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 BIM of a recently constructed building on campus using available as-built documentation and specifications. A comprehensive list of project criteria will be submitted to you at a later date.

VIII. **Final Exam**:

There will be no make-up exams. Failure to be present for a final exam may result in a failing grade.

IX. **Honors Policy**:

You are expected to follow the University Honors Policy when working on assignments, homework, projects, and exams. Please read and agree to this statement.

"I understand that the University of Florida expects its students to be honest in all of their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action, up to and including expulsion from the University."

Lab Schedule

Wk	Course Topics	Assignment DUE	Suggested reading
1	***Review Syllabus/Schedule and IT lecture # 1*** **Introduction to Revit Architecture Interface**		
2	**Review of Revit Architecture: Modeling Basics** Grids, levels, walls, doors, windows, floors, ceilings	**SOFTWARE INSTALLED**	Online Tutorials 1-8
3	***IT Lecture #2*** **Review of Revit Architecture: advanced components** editing wall, floor and roof composition, curtain walls, stairs, shaft openings, review the modify commands		Online Tutorials 9-17
4	***IT Lecture #3*** **Revit Architecture: Views, Sheets & the value of a database** Advanced wall editing (reveals, sweeps, stacked walls), generic models, views, sheets, construction documentation		Online Tutorials 18-27
5	***Energy Modeling Guest lecture*:** **Comparison of DOE2, EQuest and Green Building Studio/Ecotect**	**Homework # 1: CACIM arch model**	
6	***Group Project Requirements Assigned*** **Revit Structure:** Working with linked models, columns, foundations, beams, beam systems, trusses		
7	***Schedules and Quantities Guest lecture: Rui Liu*** **Estimating with BIM** **Review rendering/walkthroughs and materials if time	**Homework # 2: CACIM Struct model**	Online Tutorials 28-33
8	**Introduction to Revit MEP: Mechanical** Supply air, Return air, Exhaust air, equipment and systems design	**Homework # 3: CACIM Estimating Exercise**	
9	**NO CLASS SPRING BREAK**		
10	**Advanced modeling in Revit MEP: Mechanical** Hydronics and family editing: Rinker Hall Case Study	**Homework # 4: CACIM Mech. model**	
11	***Present Projects at 50% completion*** **Revit MEP: Brief overview of Electrical and Plumbing** fixtures, outlets, switches, circuits, conduit and Sanitary systems	**MIDPOINT PROJ. CHECKS**	
12	**Introduction to NavisWorks Manage:** Animations, navigation and clash detection		
13	***Guest Lecture on construction sequencing: Le Xhang*** **NavisWorks Manage: Scheduling applications for BIM**	**Homework # 5: CACIM flythrough, clash and search sets**	
14	***3D coordination and gaming exercise in BIM lab***	**Homework # 6: CACIM construction sequence animation**	
16	**Lab time for final project questions**		
17	**Last Day of Class: Model Presentations**	**FINAL PROJ. DUE**	
18	**Final exam week: Exam Time TBD**		