UNIVERSITY OF FLORIDA

M.E. RINKER, SR. SCHOOL OF CONSTRUCTION MANAGEMENT

BCN 3255 – GRAPHIC COMMUNICATION IN CONSTRUCTION (3 credits)

Spring 2024

INSTRUCTOR:	Dr. R. Raymond Issa Room 325 Rinker Hall, Phone: 352-273-1152, Email: raymond-issa@ufl.edu **Available by appointment**
TEACHING ASSISTANTS:	Jiun-Yao Cheng Yuan Sun Ajit Devkota Parth Bhadaniya **TAs' Room: RNK 340 & Virtual Zoom Office**
CLASS TIME/ROOM:	Section 30314: **Tue & Thu** 08:30am-10:25am @ RNK 240 Section 11164: **Tue & Thu** 10:40am-12:35pm @ RNK 240

OFFICE HOURS:	TAs will be available during office hours at their
	Virtual Zoom Offices are accessible through the following links
	
	Tue. 04:05 - 04:55 pm
	    Zoom: https://ufl.zoom.us/my/parthbhadaniya
	Wed. 04:05 - 04:55 pm
	    Zoom: https://ufl.zoom.us/my/yuansun
	Thu. 04:05 - 04:55 pm
	    Zoom: https://ufl.zoom.us/my/parthbhadaniya
	And any other time by appointment

COURSE WEBSITE:	CANVAS https://lss.at.ufl.edu/
EMAIL:	Mail tool in CANVAS
PREREQUISITES:	BCN 1251 - Construction Drawing (Successful completion of Construction Drawing automatically ensures that the student has the prerequisite for this course as it is now designed.)

COURSE DESCRIPTION

This course introduces students to various construction communication tools, including building information modeling (BIM), the use of computer-aided drafting (applications of 4-D modeling in construction), piece-based simulations, and blueprint reading. The goal of the course is to help students understand how to apply these communication tools to successfully manage the construction process.

COURSE METHOD

- The class meets twice weekly for two hours. The class will have an **integrated lecture-lab format** where lectures and labs happen back-to-back throughout class time.
- Students are expected to **stay in the class** until they satisfactorily complete and turn in their assignments. A student is allowed to complete an assignment at home only if the student has remained for the full class period and needs additional time to complete the assignment.

COURSE OBJECTIVES

To teach the student to read, understand and use construction documents and use building information modeling (BIM) technology. The goal of the course is to help students understand how to apply these communication tools to successfully manage the construction process.

COURSE LEARNING OUTCOMES

Upon completion of the course, students will demonstrate their ability to:

❶ Read, understand and use construction documents (construction drawings and project specifications) (SACS 5, ACCE SLO 7)

❷ Use building information modeling (BIM) technology for preconstruction modeling (SACS 5, ACCE SLO 10)

❸ Visualize a building and construction process by creating a building information model of a selected building (SACS 5, ACCE SLO 7, 10)

❹ Recognize the possibility for using BIM for estimating, scheduling, facility management, and energy analysis (SACS 5, ACCE SLO 5, ACCE SLO 10)

SACS = Southern Association of Colleges and Schools
ACCE = American Council for Construction Education
SLO = Student Learning Outcome

SACS 5: Communicate technical and financial data effectively in speech and in writing to all stakeholders in the construction process.
ACCE SLO 5: Create construction project schedules.
ACCE SLO 7: Analyze construction documents for planning and management of construction processes.
ACCE SLO 10: Apply electronic-based technology to manage the construction process.

TEXTBOOK

Commercial Design Using Autodesk Revit 2024, Daniel John Stine, SDC Publications, ISBN: 978-1-63057-581-6

RECOMMENDED TUTORIALS

- Revit Architecture 2024: *https://www.linkedin.com/learning/revit-2024-essential-training-for-architecture*
- Revit Structural 2022: *https://www.linkedin.com/learning/revit-2022-essential-training-for-structure-imperial*
- Navisworks 2023: *https://www.linkedin.com/learning/navisworks-essential-training-2023*

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware Requirements:
- **Mouse**
  - A **mouse** with a **scroll wheel** is **required** for this class.
- **Webcam and Microphone**

- A **webcam** and **microphone** are required to attend some of the sessions, office hours, and also to take some of the quizzes and tests online. Many laptops come with built-in cameras and microphones; if not, you will be required to have them separately.
- **Laptop**
  - A **laptop** computer is **required** for all the students in the Rinker School. Therefore, in this class, you will be allowed to work only on your own laptop. If anything goes wrong with your laptop, notify the instructor as soon as the problem occurs. In that case, you will be allowed to use only the computers in the Rinker School computer lab. If you use anyone else's computer (besides your own or a computer in the Rinker School computer lab), it will be considered a violation of the Rinker School policy and, thus, will be dealt with accordingly.
  - For more information about **BCN's computer requirements,** visit the website: https://dcp.ufl.edu/rinker/academics/computer-requirements/

Software Requirements:
- **Course-related Software:**
  - Autodesk **Revit 2024**
    - Download Link: https://www.autodesk.com/education/free-software/revit
    - You need to create an Autodesk account using your UFL email address
    - The student version is available for free through your Autodesk account
  - Autodesk **Navisworks Manage**
    - Access through UFApps
  - Microsoft **Project Pro**
    - Access through UFApps
- **UFApps:**
  - We will use UFApps to access these software packages.
  - How to Access UFApps
    1. Go to https://login.apps.ufl.edu/ OR click on the UFApps direct link we provided on the BCN3255 CANVAS page (left bar)
    2. Login using your GatorLink credentials
    3. Install the Citrix Receiver or opt to use the Light Version
    4. Launch your desired application by clicking on the icon/name
- **Best Practice: Using UFApps with CANVAS**
  - Accessing CANVAS files within UFApps will greatly reduce the steps necessary to get the files you need, complete your work, and then upload them back to CANVAS.
    1. Once you're logged into UFApps, launch the **E-Learning** application
    2. Login to **E-Learning** using your GatorLink credentials
       - *Now any files you need will be downloaded to your workspace in UFApps*

Exam/Quiz/…-related Software:
- **Honorlock**
  - Some of the exams, quizzes, and in-class projects might be proctored online using **Honorlock**
  - How to use Honorlock (CANVAS Student Guide): https://www.youtube.com/watch?v=xLSRgrBMz6c&feature=youtu.be
  - Honorlock Student Guide: https://drive.google.com/file/d/1kzVSvd_wlGm0Edaw38PE6KjKhobCQxVt/view

GRADING CRITERIA

Grades are viewed as a means to communicate evaluation of your work and progress. Specific evaluation criteria will be provided with each exam/project/class activity. Work will be evaluated through in-class feedback and/or written commentary. Projects, exams, and individual assignments during the semester will

be numerical grades. Each of them will be evaluated and those evaluations will be provided to students <u>based on their request</u>. The breakdown of grades will depend on the following items:

#	Item	Points	
1	Quiz #1 (Intro to Computers and BIM)	30.00	
2	Quiz #2 (Revit Parts 1-3)	35.00	
3	Quiz #3 (Revit Parts 4-6)	35.00	
4	Quiz #4 (Revit Parts 7-10, 12, 14)	35.00	
5	Quiz #5 (Navisworks Parts 1-3)	50.00	185.00
6	3D Modeling Exam Project	200.00	
7	Semester-long Commercial Building Project	200.00	
8	Reflection #1 (VDC)	20.00	
9	Reflection #2 (Bim in the Cloud)	30.00	50.00
10	Computer Spec	10.00	
11	Plan Reading Assigement	28.00	
12	Roof Design Assignment	20.00	
13	4D Simulation Assignment A	30.00	
14	4D Simulation Assignment B	30.00	118.00
15	Final Project	200.00	
	Total:	953.00	

Activities and assessments may be modified where necessary as determined by the instructor; proper notification will be given
** Undergraduate and graduate section requirements would be different for this item.

<u>Grades will not be curved,</u> but you will have various opportunities throughout the semester to achieve <u>extra</u> points for exhibiting more engagement and learning. Your "Total Points" will be divided by 915 and then your grades will be computed according to the following scale:
[Link to the university grades and grading policies](#).

A	93.00-100	**B+**	87.00-89.99	**C+**	77.00-79.99	**D+**	67.00-69.99	**E**	less than 60.00
A-	90.00-92.99	**B**	83.00-86.99	**C**	73.00-76.99	**D**	63.00-66.99		
		B-	80.00-82.99	**C-**	70.00-72.99	**D-**	60.00-62.99		

ASSESSMENT METHODS AND TARGETS

Assessment	CLO 1	CLO 2	CLO 3	CLO 4	Target
Quizzes	X	X		X	At least 80% receive a C- or better
Midterm Exam	X	X			At least 80% receive a C- or better
Semester-long Commercial Building Project			X		At least 80% receive a B- or better
BIM-based Technology Reflections/Reports				X	At least 80% receive a B- or better
Navisworks Assignments				X	At least 80% receive a B- or better
Final Project		X	X	X	At least 80% receive a C- or better

CLASS ATTENDANCE

- **Attendance is strongly encouraged.** In-class assignments/activities/quizzes might be given each lab-lecture period. You need to work on the assigned lecture exercises/lab assignments/quiz during the class. However, if you are not there or you do not work on the assigned exercise/quiz during the class, you cannot get credit for participation and assignments. Additionally, extra credit points are occasionally awarded for attendance and participation in the lecture.
- There are **no make-ups** for missed classes unless you discuss your absence with the instructor **before** the classes you miss and provide appropriate **documentation within one week** to support your absences. The **make-up for excused absences** could be done only **for one week after the absence date**.
- If you miss a class, please make arrangements to discuss the missed session with a classmate. You should also get notes from other students.

- If you miss a class, you must complete and **submit your assignment in advance**, i.e., **before** the class you miss.

ASSIGNMENTS/FINAL PROJECT

- **Late assignments and a late final project will not be accepted, regardless of the circumstances.** For late assignments and late final project, the student will receive a zero on the assignment/final project.
- All work turned in for this course should have professional quality in content and presentation.
- Assignments may be graded by detailed checking or based on the overall attempt. The instructor may choose not to grade some homework.
- All the assignments and final project have to be **submitted exclusively in CANVAS.**
- It is **your responsibility** to verify the successful submission of the assignments/final project in CANVAS. Submission by **email** or **digital media** (such as a USB drive) **will not be accepted**.
- If you have technical difficulties with CANVAS, please contact the UF Help Desk at learning-support@ufl.edu, or (352) 392-4357 - select option 2, or go to the Ground floor of the Hub. If your technical difficulties cause you to miss a due date, you MUST report the problem to UF Help Desk **before the due date/time**. Include the ticket number that you are given in an email to the instructor to explain the late assignment due to a problem with CANVAS.
  - Types of questions that should be directed to the Help Desk:
    - I cannot log into CANVAS
    - I have clicked on the "submit" button for my assignment and nothing is happening
    - I cannot upload an assignment
    - CANVAS has given me an error message and I cannot submit my assignment.
  - Poor internet connections cannot be accommodated with a ticket from the UF Helpdesk.
  - The instructor reserves the right to accept or decline tickets from the UF Helpdesk based on individual circumstances.
- An introduction and support for the E-Learning in CANVAS system can be found at: https://lss.at.ufl.edu/help/Student_Faq
- Due to the nature of the class and the Revit/Navisworks software, any consultation regarding assignments/final project and the use of the software will be conducted exclusively **in person** and consultations **via email will not be conducted**.

EXAMS AND PROJECTS

- **Exam(s) are mandatory** and scheduled in advance, so plan to attend them at the scheduled time.
- There is no make-up for the missed quizzes and the midterm exam.
- The progress you make on the "Semester-long commercial building project" as well as the "final project" will be reviewed frequently during the progress check sessions. If you do not show proper progress or miss more than one progress check session, your project grade will automatically be zero!
- All the exams, quizzes, and in-class projects will be proctored online using **Honorlock.** It would be the students' responsibility to make sure that they have the required hardware and software to properly run Honorlock during their in-session exams/quizzes/projects/…
  - See the Hardware and Software Requirements section of the syllabus

STUDENT EVALUATIONS

- Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their CANVAS course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

COMMUNICATION WITH THE INSTRUCTOR AND TEACHING ASSISTANTS

- Use the **CANVAS** environment to send an **email** to me and the teaching assistant(s). **Do not email me and the teaching assistant outside of the CANVAS system because emails received outside of CANVAS will not receive a response.**
- Please try to communicate with me and the teaching assistant(s) **during office hours**.
- Please **CC me and all TAs** within all the communications that you have with us.
- Please allow 24 hours for a response to your email through CANVAS. The teaching assistant(s) and I reserve the right not to respond to course inquiries on the weekend as well as on the weekdays after 5 p.m.
- Any communication regarding **grades** will be conducted only **in person,** as communication about grades via email or phone is not considered a safe practice. **Any inquiry about the grades must be made within one week after the grade release date.**

HONOR CODE

- 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. Click here to read the Honor Code. 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.
- **Duplication of an assignment and quiz/exam/project/activity** both manually or by computer will be considered an act of academic dishonesty and dealt with accordingly. Any violation of the Honor code will not be tolerated. A student that is found guilty of Academic Dishonesty will be given a **failing grade** for the course.
- Do not allow others to access your files, as that will also be considered a violation of the Honor Code.

DISABLED STUDENTS

- Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. Click here to get started 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.

CLASS DEMEANOR

- All **cell phones** should be **turned off** and **No text messaging** during class.
- **Arriving late** to the class or **leaving before** the end of the class will **not be accepted**. If you are attending the class, you need to be there from the beginning until the end of the class.
- **Exam(s):** You may leave the exam at any time for any reason, but there will be no re-entry into the exam room. You need to submit your exam before you leave the room. If you need to leave the room for medical or psychological reasons, be sure to provide me with documentation from the Office for Students with Disabilities.

CLASS SCHEDULE*

Week #	Class #	Day	Date	Topics	Content/Details	Software Requirements	Quiz/Assignment/Dues
1	1	Tue	9-Jan	Introduction to BCN3255	Syllabus Course Overview. And Revit Installation	–	
	2	Thu	11-Jan	Introduction to Computers	Computers Basics: Terms & Functions Windows User Interface. And Revit Installation		
2	3	Tue	16-Jan	Introduction to BIM	Challenges of descriptive geometry/2D drawings; concept of BIM; BIM main features; 3D, 4D, 5D, …, nD BIM; interoperability issue;	Revit	
	4	Thu	18-Jan	Introduction to Plan Reading	Introduction to Plan Reading		
3	5	Tue	23-Jan	Revit (Part 1): Book & Getting Started with Autodesk Revit	Revit Book; Overview of Revit user interface; Open, save, and close existing project; Creating a new project; Using zoom and pan to view your drawings	Revit	Quiz #1 (Intro to Computers & BIM)
	6	Thu	25-Jan	Revit (Part 2): Small Office Quick Start	Walls, grids and dimensions; Doors; Windows; Roof; Annotation, Room tags & schedule		
4	7	Tue	30-Jan	Revit (Part 3-a): Floor Plan (First Floor)	Project overview; Exterior walls; Interior Walls	Revit	
	8	Thu	1-Feb	J1 Field Trip	No Class		
5	9	Tue	6-Feb	Revit (Part 3-b): Floor Plan (First Floor)	Elevator; Doors & Windows	Revit	Progress Check I: (Revit Parts 1-3)
	10	Thu	8-Feb	Revit (Part 4 & 5): Floor Plans (2nd & 3rd Floors) & Vertical Circulation	Copy common walls from first floor; additional interior walls; Setting the floor-to-floor height & Stairs		Quiz #2 (Revit Parts 1-3)
6	11	Tue	13-Feb	Revit (Part 6): Roof	Roofs; Skylights	Revit	
	12	Thu	15-Feb	Revit (Part 7): Floor Systems and Reflected Ceiling Plans	Floor systems; Ceiling systems (Susp. ACT & Gypsum board); Placing fixtures (lights & diffusers); Annotation		
7	13	Tue	20-Feb	Career Fair	No Class	Revit	
	14	Thu	22-Feb	BIM-based CommTech in Construction: BIM in the Cloud + Reflection	Progress Check II: (Revit Parts 4-7)		
8	15	Tue	27-Feb	Revit (Part 8): Interior & Exterior Elevations	Creating & viewing exterior elevations; Modifying the project model (exterior elevations); Creating & viewing interior elevations; Modifying the project model (interior elevations); Adding mullions to a curtainwall	Revit	Quiz #3 (Revit Parts 4-7)
	16	Thu	29-Feb	Revit (Part 10): Sections & Details	Texts, Dimensions, Sections		
9	17	Tue	5-Mar	Revit (Part 12): Schedules	Room & door tags; generate a door schedule; generate room finish schedule	Revit	
	18	Thu	7-Mar	Revit (Part 14): Construction Document Set	Setting up a sheet; Sheet index; Printing a set of drawings Exam Review		
10	19	Tue	12-Mar	Spring Break	No Class	Revit	
	20	Thu	14-Mar	Spring Break	No Class		
11	21	Tue	19-Mar	Miderm Exam-Project A Revit-based Project	–	Revit	
	22	Thu	21-Mar	BIM-based CommTech in Construction: BIM in the Cloud + Reflection			
12	23	Tue	26-Mar	Revit (Extra Part): Structures and Linking Model	Creating a foundation and footing in Revit Structure and linking it with Revit Architecture	Revit	
	24	Thu	28-Mar	Progress Check III: (Revit Parts 8-14)			
13	25	Tue	2-Apr	Navisworks (Part 1): Getting started with Navisworks	Basic features; Benefits of using Navisworks; User interface; Configuring settings in Navisworks; File types in Navisworks; Exploring the Navigation tools in Navisworks	Navisworks, MS Project, Revit	Semester-long Commercial Building Project
	26	Thu	4-Apr	Navisworks (Part 2): Intro to scheduling using MSProject	Project start date; define & insert tasks; task duration and project calendar; sequence of tasks and task relationships; Manual & automatic scheduling		
14	27	Tue	9-Apr	Navisworks (Part 3-a): 4D Scheduling with Navisworks	Timeliner; Tasks; Data source; Simulate; Exporting animation from Timeliner	Navisworks, MS Project, Revit	
	28	Thu	11-Apr	Navisworks (Part 3-b): 4D Scheduling with Navisworks	No sets/schedule has been defined; Define sets based on your tasks at schedule; Navisowrks final review		
15	29	Tue	16-Apr	Final Project: Workday	Introduction to Final Project	Navisworks, MS Project, Revit	Quiz #5 (Navisworks Parts 1-3)
	30	Thu	18-Apr	Final Project: Workday + Progress Check I			
16	31	Tue	23-Apr	Final Project: Workday + Progress Check II		Navisworks, MS Project, Revit	
	1-Feb	–	25-Apr	Reading Days	No Class		
			27-Apr - 3-May	Final Examinations	This course doesn't have a final exam		
			8-May	Final Grades Available			

* The syllabus represents our current plans and objectives. As we move forward throughout the semester, those plans might need to be changed to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

COURSE ROADMAP

Intro to Computers, BIM & Plan Reading

Course content/schedule/roadmap

Computer basics: terms & functions & hardware/software requirements; Windows user interface;

File Management

Descriptive geometry/2d drawing

3D/4D/5D/.../nD BIM

Intro to plan reading

Quiz #1 (Intro to Computers & BIM)

Revit (Parts 1 & 2)

Getting Started with Revit

Overview of Revit user interface;

Open, save, and close existing project;

Creating a new project;

Quick Start: Small Office

Learn how to use the Book

Better understand the Revit User Interface

Revit (Parts 3, 4, & 5)

Project overview;

Exterior walls;

Interior Walls;

Elevator;

Doors & Windows

Quiz #2 (Parts 1-3)

Copy common walls from first floor; additional interior walls;

Setting the floor-to-floor height;

Stairs

Revit (Parts 6 & 7)

Roofs;

Skylights

Floor systems;

Ceiling systems (Susp. ACT & Gypsum board);

Placing fixtures (lights & diffusers);

Texts and Annotation

Quiz #3 (Parts 4-7)

Revit (Part 8 & 10)

Creating & viewing exterior elevations;

Modifying the project model (exterior elevations);

Creating , viewing, & modifying interior elevations;

Adding mullions to a curtainwall

Specifying section cutting plane in plan view

Building section

Wall section

Revit (Parts 12 & 14)

Room tags;

Generate room finish schedule

Door tags

Generate a door schedule;

Setting up a sheet;

Sheet index;

Printing a set of drawings

Quiz #4 (Parts 8, 10, 12, 14)

3D Modeling EXAM

Navisworks (Part 1)

3D + Time = 4D Scheduling

Basic features;

Benefits of using Navisworks;

User interface; Configuring settings in Navisworks;

File types in Navisworks;

Exploring the Navigation tools in Navisworks

Navisworks (Part 2)

3D + Time = 4D Scheduling

Project start date;

Define & insert tasks;

Task duration;

Project calendar;

Sequence of tasks and task relationships;

Manual & automatic scheduling

Navisworks (Part 3)

3D + Time = 4D Scheduling

Timeliner and Simulation;

Exporting animation from Timeliner

What if no sets/schedule has been defined;

Defining sets based on your tasks at schedule

Quiz #5 (Navisworks Parts 1-3)

FINAL PROJECT

BIM-based Communication Technology in Construction

BIM & VDC

BIM in the Cloud