STRUCTURAL MODELING

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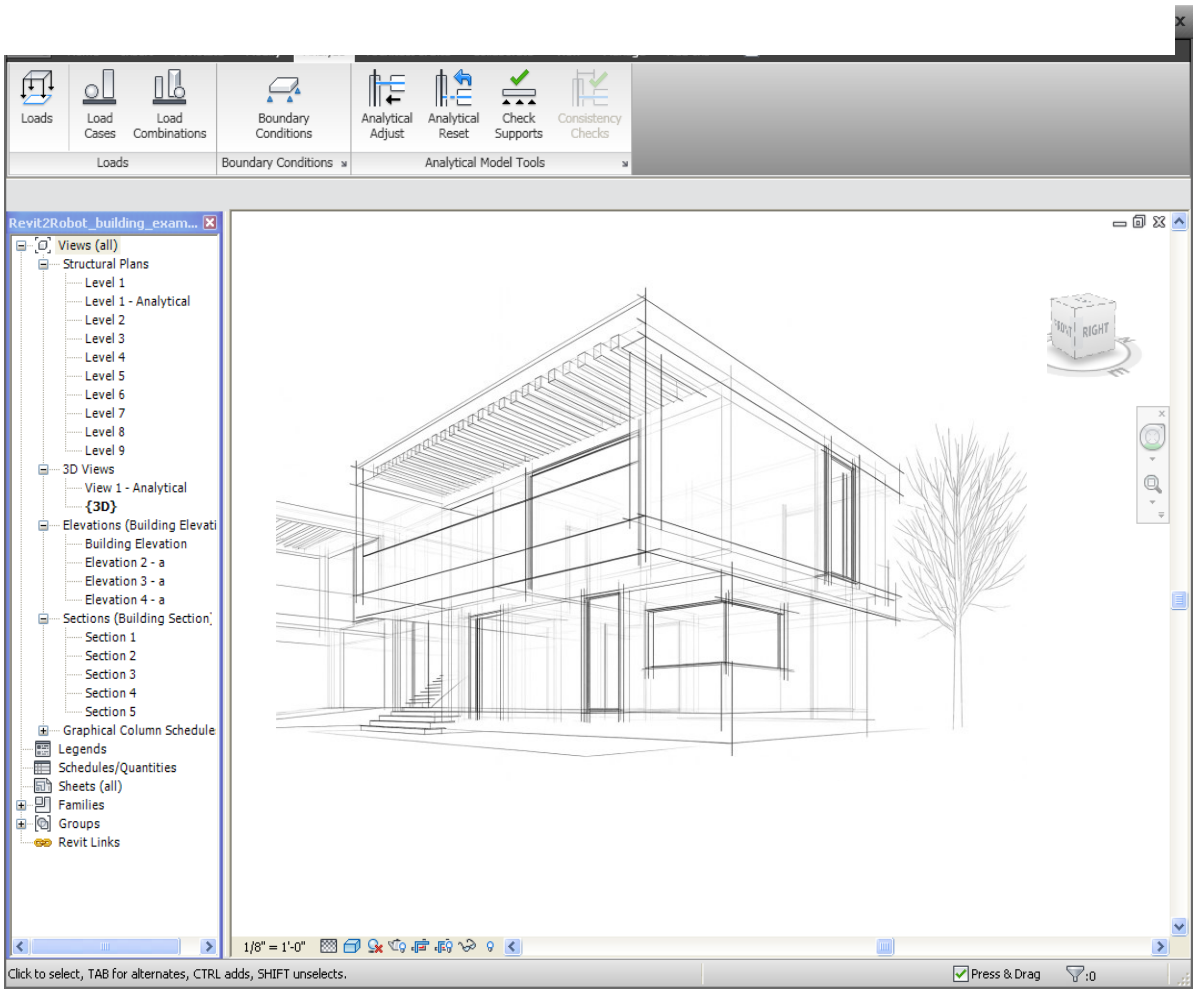

N. Nawari, Ph.D., P.E., F.ASCE

University of Florida
School of Architecture

University of Florida
School of Architecture
Fall-2025

SYLLABUS

1. Course: STRUCTURAL MODELING (3 credits)

2. Class Textbooks and Software

i. Building Information Modeling (BIM): A framework for Structural Design, by **Nawari** & Kuenstle, CRC Press. **(Highly Recommended)**

ii. BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors. By Eastman.(**Recommended**)

Required Software:

i- REVIT 2025 (Free download from Autodesk Student Community website: http://students6.autodesk.com/)
ii- ROBOT STRUCTURAL ANALYSIS PROFESSIONAL 2025 (Free download from Autodesk Student Community website: http://students6.autodesk.com/)
iii- RISA 3D and RISA floor (www.risa.com)

3. Materials and Equipment

1. Laptop Computer.
2. Scientific Calculator.

4. Instructor:

N. Nawari, Ph.D, P.E., F.ASCE
Class Hours: T 1:55 pm.- 4:55 pm.
Office Hours: M TH 2:00 pm – 4:00 pm
Building: CSE E231

5. Prerequisites ARC3492C Integrated Building Technology 2 (IBT2) or its equivalent (Determined by instructor).

6. General Requirements

1- The class is to be handled and conducted in a professional manner. Student attitude and participation are essential for completing the course successfully.
2- The student is required to attend all course lectures. The **s**tudent is responsible for knowing the lecture material, homework assignments, and announcements that are made in class. The student should be aware that there is a strong correlation between student performance and class attendance.
3- The student is required to read the material in the text, which follows the class lectures. See the table for reading assignments.
4- The student is required to complete the homework, quizzes, projects, midterms, and final described below for his/her grade. Exam attendance is mandatory**.** If you have a valid reason for missing a homework assignment, project, or any other assignment, you are responsible for notifying me and scheduling a makeup before the exam is administered or the final project due date. Unexcused absences will be given a zero score.

7. Course Description

This course introduces the fundamentals of STRUCTURAL MODELING. The course also develops the understanding of building information modeling (BIM), digital design, and approximate systems analysis and detailing for architectural structures. Students will learn how to efficiently implement **BIM** to organize, coordinate and communicate information in order to convey data necessary for structural systems. Incorporated are applied projects and field sketches related to building design and detailing.

8. Course abstract and objectives

To provide a fundamental understanding of structural system planning and structural modeling. The coursework and lectures address the fundamental principles of building information modeling and their relation to structural modeling and building design implications. Special emphasis is placed on the practical design process of steel, wood, and concrete buildings.

The main topics addressed include:

A. Introduction to building information modeling (**BIM)** fundamentals
B. Structural Planning
C. Structural **BIM** using Revit Structure
D. Modeling Columns, beams, floor slabs, roof decks, walls, framing, foundations, and rebars.
E. Examples: Concrete Buildings, Steel Buildings, Wood Framed Buildings, Hybrid Buildings.
F. Sheets and construction documents
G. Families creation
H. Model Sharing: internal and external sharing
I. Productivity, Interoperability
J. Visualization and Rendering
K. Structural analysis and design
L. AI and Structural Modeling
M. Integrated practice
N. Architectural case studies to examine conceptual development, structural design, integrated building design process and the production of construction documents.

At the completion of this course, the student should have a sound understanding of these concepts and principles along with the skill gained in utilizing REVIT and related technologies and be able to apply them in designing steel, wood, and concrete buildings.

POLICIES

9. Homework and Assignments

All homework and other assignments are due at the assigned due date. Homework, classwork, and project assignments submitted after the due dates will incur a 20% penalty for each day they are late. No credit will be given for an assignment turned in later than 5 days after the date it is due. The students are responsible for the materials presented and discussed in class, lab period, and in assigned readings. Exams, projects and exercises are written with the assumption that individual students are keeping up with the reading assignments and attending all the lectures and lab sessions.

10. Attendance and Unexcused

Attendance is more than your physical presence during the scheduled class and lab periods. It requires active involvement during class and laboratory periods, including preparing the assigned readings and participating in laboratory discussions.
Students are expected to attend all class meetings (lectures, lab periods, field trips and guest lectures, and discussions). A missed attendance should receive prior authorization from the instructor except under extenuating circumstances. It is the student's responsibility to obtain information pertaining to lecture notes, or handouts distributed during any missed session. Students who miss class without prior approval of their instructor will receive a grade of zero on the missed class assignment.

Additional details regarding attendance and accommodation are as follows. Attendance for all lectures, labs and/or workshops is mandatory and is recorded. Chronic absences and/or tardiness will have a negative impact on your grade. Tardiness of more than 20 minutes to any lab/lecture will be counted as an unexcused absence. Three or more unexcused absences may result in a full letter-grade reduction in the course. Four unexcused absences can result in failure of the course (see grade breakdown above). Materials covered in the lecture will be tested. If you must miss class, it is your responsibility to notify the instructors in a timely manner, as well as getting the assignments and notes from your classmates. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: www.https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

11. University Excused

Authorized absences must be approved by your instructor in advance of the absence unless you have an emergency or illness. Make-up work must be completed outside of normal class hours within ONE WEEK following an excused absence. IT IS YOUR RESPONSIBILITY to see your teacher and make arrangements for make-up work.

12. Class

T 1:55 am.-4:55 pm. Including lectures, lab exercises, and exams, it is required that each student attend and participate in all class and lab sessions. Excused absences must have written confirmation.

13. Student with Disabilities

In accordance with the University policy, if you have a documented disability and require accommodation to obtain equal access in this course, please contact the instructor at the beginning of the semester or when given an assignment for which an accommodation is required. Students with disabilities must verify their eligibility through the Disability Resource center in the Dean of Student office located in 0001 Building 0020 (Reid Hall), Te1. 352-392-8565, fax. 352-392-8570, e-mail at accessuf@dso.ufl.edu. Upon verification, the DRC staff member will present you with "accommodation letters", to give to your instructors.

14. Building Hours

Students are required to comply with the University-established building hours of operation.

15. School Policy

As a reminder, the classrooms, studio, offices, and hallways are non-**smoking** areas. Smokers using the building entrance areas are expected to dispose of their refuse in an appropriate manner**.** The use of cell phones etc, is prohibited during scheduled class meeting times. Students are expected **to turn off in-coming cell phone** ringers so that they do not disturb class proceedings. In summary, students are required to maintain the studio, computer lab and class areas in conformance with fire, safety, and health regulations and codes and to maintain a "professional working environment' Miscellaneous damage from activities such as cutting directly on desk tops will not be tolerated. The use of pressurized spray paint or spray fixative is not allowed in the studio/classroom hall and stair towers.

16. Evaluation

No assignment, interim or final will be accepted without a valid excuse after the date and time due. Incomplete projects must be submitted on the assigned time and dates. Time due is given for each assignment on the Canvas website (unless otherwise stated.) Homework and classwork assignments will be graded periodically during the semester.

Assessment of a student's performance in the homework problems, lab computer problems, and projects, given throughout the semester session including skills and participation in all class activities. There are different requirements and expectations for graduate and undergraduate students for coursework assignments and projects. Project 1 encompasses the design and modeling of a cabana located in Jacksonville, Florida. Project 2 entails the modeling and structural analysis of a steel structure intended for a Wawa gas station.

Students are expected to be present and prepared for all class sessions, group discussions, reviews, and field trips. The School uses the University's standard grading system, a letter grade that is translated into points of course credit as follows:

Grade Values for Conversion May 11, 2009 and After												
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E, I, NG, S-U, WF
Grade Points	4.0	3.67	3.33	3.00	2.67	2.33	2.00	1.67	1.33	1.00	.67	0.00

Please note that The University requires that a graduate student maintain a 3.0 (B) average to remain in good academic standing. Every possible effort is made to counsel students experiencing academic difficulty to determine the cause and possible solution, so that they can continue and complete their studies at the University. The graduate design studio and support courses are in required sequences that must be taken in order.

An incomplete ("I") grade for any graduate or undergraduate architecture design studio prerequisite course must be resolved with a grade change form completed before the first day of class of the following semester in order to enroll in the next course of the studio sequence. Faculty that issue incomplete grades must be available to work with their student and complete the grade change form prior to the first day of classes the following semester. Special circumstances can be addressed through an official appeals process with the SoA Director and the approval of the course instructor.

Note
If you need classroom accommodation for a disability, you must first register with the Dean of Students' Office. The Dean of Students' Office will provide you with documentation to submit to the instructor when requesting accommodations.

17. Grading

Homework/Lab/Classwork	45 %
Project I (Fundamental of modeling)	25 % (Due date:10/21/2025)
Project II (Advanced modeling)	30 % (Due date: 12/08/2025
TOTAL	100 %

18. Grading Scale and Policy

Information on UF's grading policy for assigning grade points can be found at the following location:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Grading Scale

Letter Grade:	Percentage Range:		Grade Points:
A	100 %	to 93.0%	4.0
A-	< 93.0 %	to 90.0%	3.67
B+	< 90.0 %	to 87.0%	3.33
B	< 87.0 %	to 84.0%	3.0
B-	< 84.0 %	to 80.0%	2.67
C+	< 80.0 %	to 77.0%	2.33
C	< 77.0 %	to 74.0%	2.0
C-	< 74.0 %	to 70.0%	1.67
D+	< 70.0 %	to 67.0%	1.33
D	< 67.0 %	to 64.0%	1.0
D-	< 64.0 %	to 61.0%	0.67
F	< 61.0 %	to 0.0%	0

19. Honor Code

All students are expected to follow the honor code- submit only their original work. Students are expected to work individually on their assignments. Students may discuss the assignment, interpretation of the results, procedure to be used, etc… in groups to enhance understanding and analyze alternative approaches.

***All work is to be legible & presented in a professional manner.**

20. Shared Policies

The Office of Accreditation, Assessment, and Curriculum has created a go-link that should be included in the UF syllabi. This link will direct students to a separate webpage that provides all required academic policies, including attendance, grading, DRC, and evaluation verbiage, as well as campus academic, health, and wellness resources. Please see below for the link: https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

20. Tentative Schedule

Class	DATE	TOPICS	ASSIGN. PROBS.	SUPPL. Info.
1 T	8/26/2025	Organization, Introduction, Structural Modeling	In class and Canvas	
2 T	9/02/2025	Introduction Revit Architecture / Revit Structure	In class and Canvas	
3 T	9/09/2025	BIM fundamentals	In class and Canvas	
4 **T**	9/16/2025	REVIT Structure: Modeling Structural Members	In class and Canvas	
5 T	9/23/2025	Modeling Structural Members	In class and Canvas	
6 **T**	9/30/2025	Modeling Structural Members/ AI introduction	In class and Canvas	
7 T	10/07/2025	Linking CAD Files/ Material Takeoff and Collision Detection	In class and Canvas	
8 **T**	10/14/2025	Sheet and Construction Documents	In class and Canvas	
9 T	10/21/2025	AI and Structural Modeling	In class and Canvas	**Project 1 Due date**
10 **T**	10/28/2025	Families Creation	In class and Canvas	
11 **T**	11/04/2025	Revit Structural Analysis	In class and Canvas	
12 **T**	11/11/2025	**Holiday**	In class and Canvas	
13 T	11/18/2025	Revit Structural Analysis	In class and Canvas	
14 **T**	11/25/2025	**Thanksgiving**	In class and Canvas	
15 T	12/02/2025	Integrated Practice	In class and Canvas	
	12/08/2025	**Project II Due Date**		