FIU | Moss School of Construction, Infrastructure and Sustainability

BCN 5406 U01C. PRINCIPLES OF BUILDING STRUCTURES
COURSE SYLLABUS
Fall Term 2021

Class Schedule: Wednesday 6:45 to 9:45 PM, at EC Room 2420, Engineering Campus
Section U01C, Class No. 5406
Graduate Course; BCN 5406
Fall Term, August 23 to December 11, 2021

Instructor: Alfredo J. Ravinet, Ph. D., G.C.

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COURSE OBJECTIVES

This Course will address, describe and quantify building structures and we will study the technologies and explain their physical reality and analyses the design of the infrastructure with the most appropriate and cost effective solutions.

Also, analyze and make the anatomy of the collapses of the New Your Twin Towers and the Miami Beach Champlain Building.

Construction Management, Civil Engineering and Architecture Graduates will learn the best and most advance structures for residential, commercial, government and industrial buildings.

Also, the Course will discuss the relevant federal, state and county organizations and regulation applicable to regulate and apply the correct and most appropriate structural technologies with the most effective support from Construction Managers, Engineers and Architects.

COURSE OBJECTIVES:

- At the completion of the course, students are able to:
  1. Identify forces that are considered in design and construction of buildings and structural principals
  2. Develop an understanding of Structural Domes, Tension and Compression Structures and Membranes
  3. Develop an understanding of Building Loads and Codes
  4. Evaluate the stress and strain forces applied to structural members and structural requirements
  5. Describe the design of beams, joists, rafters and columns
  6. Define the properties of structural materials including timber and wood products
  7. Develop an understanding of Structural Aesthetics and Failures

PREREQUISITES: Construction Management, Civil Engineering, Architecture or others with BS degrees.

REQUIRED TEXTBOOKS AND REFERENCES:

"Structure in Architectures, the Building of Buildings" 4t Edition
By Salvadori, Heller, Oakley. Pearson Publishers

- Classroom handouts (many!) mostly through Canvas

ATTENDANCE POLICY

You are advised to attend all classes, exams and presentation sessions.

STUDENT CONDUCT

We believe that a good level of communication is basic for your learning process and your participation in class is welcome and also active communication through Blackboard and e-mail. For a face to face conversation you are required to call for appointments to set a time of mutual convenience and provide the opportunity to talk about your questions, doubts and discussion of relevant topics and grades. All, these activities will be rewarded with an additional grade.

Acts of academic misconduct, impolite class interruptions, cheating, plagiarism, misrepresentation, will not be tolerated. If a student is found to be engaging in such a behavior will be referred to the University's Student Academic Board. Misconduct procedures contained in the FIU Handbook will be applied and the consequences are spelled in their handbook.

The use of your cell-phone, i-pad, etc. during class sessions is not allowed except when student expect a justified emergency call.

EXAMINATIONS

There will be several Quizzes/home works, one Mid-term examination, one Final Examination, Oral Group Presentation and one Term Project Paper. All of these work assignments are required for successful completion of the Course. If you need to be absent of one class due to an event of a verifiable illness or emergency, please, get my approval ahead of time.

Your examinations, presentations and Term Papers will be scheduled on the Course outline and will include all the material covered as of the last examination. Quizzes/Home works will be due as announced through our communication media.

HOLIDAYS AND DISABLED STUDENTS ACCOMODATIONS

The College of Engineering abides to the University's policy concerning religious holidays as stated in the University catalogue. Students may request to be excused from a class to observe a religious holiday for their particular faith.

Students with any kind of disabilities who may need special accommodations should register with the FIU Office of Disabilities Services (ODS), telephone (305) 348-3532 and I will accommodate them accordingly for their needs in a fair and equitable way**.**

GRADING POLICY.

The final grade for the course will be based on your understanding of the course material as evidenced of your performance on the examinations, class participation, topic's discussion, term project paper and presentation in consonance with the following:

The percentages show the relative weight placed in the activity during the course:

Class participation and Quizzes/HW		35%
Mid-term Examination (open book)	June 23	15%

Student Presentations (in team groups)	December 1st	20%
Term Project Paper (by team groups) due	December 1st	15%
Final Examination (open book)	December 8	15%

Course Syllabus and Dates

Date	Activity
August 25	New York Twin Towers and Miami Champlain Building, Anatomy of their collapse.
September 1st	Chapter 1. Structures in Architecture
September 8	Ch. 2. Physics: building loads and Building Codes
September 15	Ch. 3. Structural Materials
September 22	Ch.4. Structural requirements for sound and safe buildings
September 29	Ch. 5. Basics for different states of stress
October 6	Ch. 6. Tension and Compressions in typical structures
Oct. 13	Ch.7. Beams
Oct. 20	Ch. 8. Frames and Arches
Oct. 27	Ch.9. Fine points for structural behavior
November 3	Part III. Chapter 10. Grids, plates, folded plates and space frames
Nov. 10	Ch. 11. Structural membranes
Nov. 17	Ch. 12. Thin structural shells and reticulated domes.

Nov. 24	Ch. 13. Structural failures
December 1st	Chapters 14 and 15. Structural aesthetic and understanding the structural principles. Students presentations
Dec. 8	**Final Exam**