

**BCN 5589 U01C. HAZARDS MITIGATION AND PREPAREDNESS  
COURSE SYLLABUS  
Spring Semester 2024**

Class Schedule: Monday 6:25 to 9:05 PM, at EC Room 1114 (in person), Engineering Campus  
Section U01C, Class No. 14749  
Graduate Course; BCN 5589 U01  
Spring Semester, January 9 to April 23, 2024

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

Office: EC 2954 at Florida  
International University  
Fax: (305) 220-3198

**Phone:** (305) 206-2581

**E-mail:** [ravineta@fiu.edu](mailto:ravineta@fiu.edu), [ravineta@gmail.com](mailto:ravineta@gmail.com)

### **COURSE OBJECTIVES**

Engineering and construction technology does not inflate as a balloon, expanding human power over Nature evenly in all directions and at all scales. It grows like a sea urchin; their long spines of ability radiate out toward specific needs and desires.

When a hazardous event break as happened in the Caribbean Islands and in South Florida, or on board of the Deepwater Horizon oil rig in the Gulf of Mexico, or at the Fukushima Dai-ichi nuclear plant in Japan, or the collapse of the Twin Towers in New York, or the collapse of the Champlain Tower in Miami Beach there is no ameliorative engineering technique on a par to contain the forces of Nature or the failure of human technology.

This Course will address, describe and quantify in time and space the physical phenomena of hazards and all kind of disasters and we will study the challenging technologies to forecast the different hazards. Meteorology, hydrology and geology will explain their physical reality and assess the occurrence in view of designing and preparing the infrastructure with the most appropriate, prompt and cost effective reaction and response.

Construction Management, Civil Engineering and Architecture Graduates will learn the best management practices (BMP) in order to sustain and protect the human life and health of the population, infrastructures and residential, commercial, government and industrial buildings and properties.

Also, the Course will discuss the relevant federal, state and county organizations and regulations applicable to regulate and apply the correct and most appropriate actions conducive to prepare and mitigate building construction consequences and impact of the natural and man-made produced hazards, implemented with the most effective professional support from Construction Managers, Engineers and Architects.

Our target is that after you have successfully completed this Course students will know how to:

- Define and use the terminology and concepts applicable to the practice of hazard preparedness and mitigation
- Know and understand the various laws, statues and regulations that provide the regulatory framework for the practice of hazard mitigation in the United States and also other countries
- Understand and apply methodology to assess the effectiveness, including, the cost-benefit of different proposed hazard mitigation options in the process of choosing among them for a specific occurrences
- Incorporate this concepts and methodologies in the daily practice of your work as engineers, construction managers and architects.

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

**REQUIRED TEXTBOOKS AND REFERENCES:**

- Wind and Earthquake Resistant Reinforced Concrete Buildings
- Somnath Ghosh; Arundeb Gupta
- Classroom handouts (many!) mostly through Canvas

### ATTENDANCE POLICY

You are advised to attend all classes, exams and presentation sessions. **Beyond 2 classes absence the student must consider dropping the Course.**

### 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 CANVAS 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 the 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, an 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 CANVAS.

### 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 to evaluate that the students have achieved the 4 Course Objectives, will be based on their 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 based on the activity during the course:

Class participation and Quizzes/ HW's		30%
Mid-term Examination (open book)	March 5	15%
Student Presentations (in team groups)	April 16	20%
Term Project Paper (by team groups) due	April 16	15%
Final Examinations (open book)	April 23	20%

<b>JANUARY 10</b>	Course introduction, objectives and duties. structural hazards. major man-made hazards. wind forces, Hurricanes. (1 and 2a.)
<b>16</b>	Continuation on Hurricanes. Building main loads and wind loads. (2a and 2c.)
<b>23</b>	Winds vs. Storm Surges. Hurricane Andrew, Katrina, Sandy, Irma, etc.
<b>30</b>	ASCE and their Standard 7-16: Load Calculations: velocity vs. pressure. 10 main factors of the loads. Directional procedures.
<b>FEBRUARY 6</b>	Changes to the ASCE Standards. Testing and Inspections.
<b>13</b>	Examples
<b>20</b>	Roof top equations and roof items. Floods Introduction
<b>27</b>	No class, Spring Break.
<b>MARCH 5</b>	ASCE 7-16 Floods Mid-Term Exam.
<b>12</b>	ASCE 24-14 for Floods. Field visit to the Wall-Of-Wind (5:30 PM)
<b>19</b>	Materials and Construction.
<b>26</b>	Man Made Hazards (4) Tsunamis (3b)
<b>APRIL 2</b>	Earthquakes (3a), Fire Hazards. Champlain Tower Collapse. Sunny Isle, Florida. 2022
<b>9</b>	Nuclear Plants Construction (4c), Fukushima-Daichi and Chernobyl Explosions. Sanmen construction. Government Actions and Regulations
<b>16</b>	Students Papers Submittals and Group Presentations. Final Exam Review.
<b>23</b>	Final Exam.