

Earthquake Engineering Research Institute  
Technical University of Civil Engineering Bucharest  
**STUDENT CHAPTER**

“Earthquakes are natural phenomenons caused by the release of energy inside Earth due to rock fractures formed due to compression or tension. ”

Types of seismic waves that affect Romania, defined by the National Research Institute for Earth Physics:

13 Surface waves  
low depth, powerful effects over small areas.

1 Body waves  
medium depth (Vrancea, 60-200 km), powerful effects over large areas

### Romania’s major earthquakes

**year 1802**  
date 26th october  
magnitude 7,9-8,2  $M_w$   
time 2m30s



**4 dead**  
**hundreds injured**

**year 1940**  
date 10th november  
magnitude 7,4  $M_w$   
time 45s



**1600 dead**  
**12100 injured**

**year 1977**  
date 4th March  
magnitude 7,2  $M_w$   
time 55s



**1578 dead**  
**11300 injured**

The current situation of Bucharest’s buildings according to official records is:

5000 buildings are found at major seismic risk (first grade risk) - collapse of the entire building, total damage

1400 buildings are found in the second category (second grade risk )- partial collapse

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6400 buildings -> with an occupancy coefficient of 2.5-3 individuals -> 16 000- 20 000 individuals exposed to a high seismic risk

“The goal of Earthquake engineering is to design various types of structures resistant to earthquakes. ”

In order to do that, we need more experts who are intense educated in this field.

Preamble

Contest

Team

Budget

HUB UTCB

Earthquake Engineering Research Institute through the Student Leadership Council organizes between April 5th and 8th 2016 an international earthquake engineering contest called " 2016 Undergraduate Seismic Design Competition ".

Student Association in Civil Engineering Bucharest has integrated this action in HUB UTCB project on second axis " Increasing student's research activity", forming a team of eight students from Technical University of Civil Engineering Bucharest to participate in the competition.



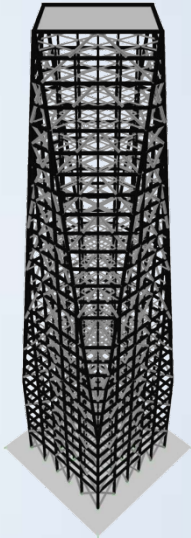
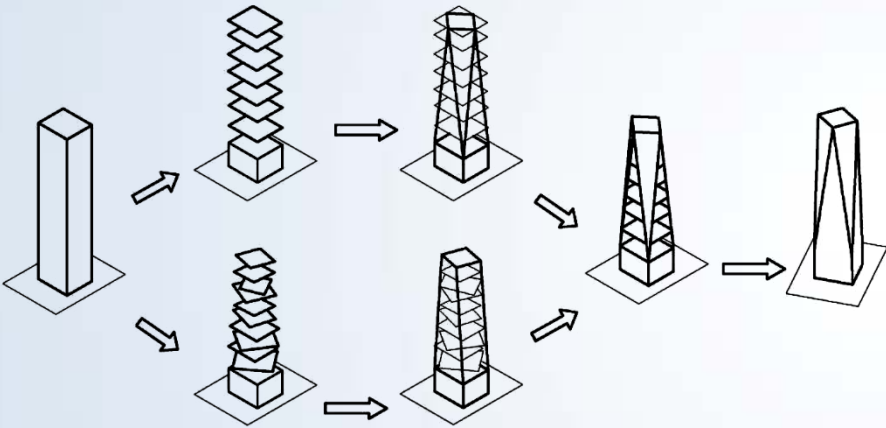
The Earthquake Engineering Research Institute (EERI) is a leading technical society in dissemination of earthquake risk and earthquake engineering research both in the U.S. and globally. EERI members include researchers, geologists, geotechnical engineers, educators, government officials, and building code regulators. Their mission, as stated in their 5-year plan published in 2006, has three points: "Advancing the science and practice of earthquake engineering; Improving understanding of the impact of earthquakes on the physical, social, economic, political, and cultural environment; and Advocating comprehensive and realistic measures for reducing the harmful effects of earthquakes".



- EERI Student Leadership Council organize the Undergraduate Seismic Design Competition and has as objective:
- help students to develop leadership and international skills, while gaining practical experience within the earthquake engineering fields
  - serve as an active student earthquake engineering community for sharing knowledge, exchanging experiences, and promoting education
  - represent home EERI student chapters and have the opportunity to positively impact other EERI student chapters.

The first stage of the competition was to develop a design proposal for a tall building, located in an area (more accurate in San Francisco) characterized by high seismic hazard conditions.

There were only 2 places for new teams outside the USA and Canada, and our team was qualified for next stage.

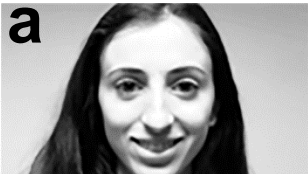


Next, our team will have to build a small scale balsa wood model of the building. Then the model would be transported to San Francisco (USA), where the competition will be held. The balsa structure will be subjected to three strong ground motion recordings on the shaking table.

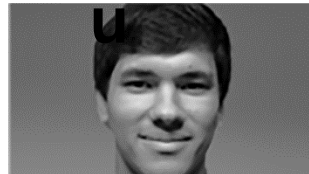
The team that will represent the Technical University of Civil Engineering at the international competition consists of eight students in the 4th year of the Faculty of Civil, Industrial and Agricultural Engineering, four faculty advisors and an industry advisor.

Ionu  
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**Petronel**



**Rad**



**Giorgiana**



**EERI  
UTCB  
STUDENT CHAPTER**



**Andreea**



**Alexandra**



**Catalina**



**Oana**

## Faculty advisor

### **Prof. univ. dr. ing. Radu VĂCĂREANU**

2012-2016

U.T.C.B. Vice-Rector for Research

2002-2008

Director - National Center for Seismic Risk Reduction  
Earthquake Engineering advanced studies at the Buildings  
Research Institute Tsukuba, Japan

### **Ing. Ionuț CRĂCIUN**

PhD student in Earthquake Engineering and Structural  
Reliability

Member of Seismic Risk Assessment Research Center

## Industry advisor

### **Ing. Dragoș MARCU**

General Manager Popp & Asociații

### **Assoc. Prof. Mihail IANCOVICI Ph.D.**

2015 - prezent

Director of Mechanics of Structures Department

2008 - 2009

Director - National Center for Seismic Risk Reduction  
Earthquake Engineering advanced studies at the Buildings  
Research Institute Tsukuba, Japan

### **Assoc. Prof. Viorel POPA Ph.D.**

2015-prezent

Director of Reinforced Concrete Buildings Department

Earthquake Engineering advanced studies at the  
Buildings Research Institute Tsukuba, Japan

“Seismic disaster preparedness in Japan” - Tokyo  
University, Institute of Industrial Science

In order to be represented in this international competition, Romania, and hence engineering school in Romania, we need financial support to cover the costs for the building model, transportation and accommodation of the romanian students in the USA.

<b>Estimated budget</b>	
Balsa model and transportation	2000 €
U.S.A. visa	1500 €
Students transport	10000 €
Students accomodation	5000 €



## Goal

Aims to create an integrated development environment complementing to the academic training to facilitate insertion into the labor market of students.

## Objective

- OP.** Facilitate insertion into the labor market of student
- O1.** Creating an effective system of practices in design and execution
- O2.** Developing entrepreneurial skills of students
- O3.** The active participation of students in the research programs within UTCB
- O4.** Increasing the professional level of students

By establishing HUB UTCB we follow to create the right environment for professional development of students in the construction industry on several axes:

### Axa 1. Professional practice

### Axa 2. Increasing student's research activity

### Axa 3. Developing entrepreneurial skills of students

## Contact

### HUB UTCB

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### EERI UTCB STUDENT CHAPTER

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**Join HUB UTCB - Team!**

**Invest in education, support UTCB team at EERI 2016 Undergraduate Seismic Design Competition**

For more information click below:



2016 Undergraduate Seismic  
Design Competition