

Pioneering Works in Earthquake Engineering in Egypt

By

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Overview of Presentation

- Introduction
- Earthquake Engineering Education
- Earthquake Engineering Research
- Establishment of ESEE

Introduction

- **Until late seventies, the general belief among Egyptian University Staff Members, Engineers, Citizens and Decision Makers was that Egypt is a Free–Earthquake Hazard Country**
- **The first effort to introduce the concept of Earthquake Engineering in Egypt was done in 1978 by Sobaih at the Faculty of Engineering, Cairo University.**

- **This effort has been continued for the next thirty years, (1978-2008). This has resulted into a tremendous impact on the state of practice of Earthquake Engineering in Egypt.**
- **One can easily notice such an impact in the following fields:**
 - 1- Earthquake Engineering Education**
 - 2-Earthquake Engineering Research**
 - 3-Establishment of the Egyptian Society for Earthquake Engineering (ESEE)**

Objective:

This presentation is concerned with giving more details on these three items and shows the positive changes they have had on the status of Earthquake Engineering Practice in Egypt.

Earthquake Engineering Education

- in 1982 Sobih has suggested to establish a Graduate Diploma in Earthquake Engineering at the Department of Structural Engineering at Cairo University. This move was denied on the department level.
- Alternatively, it was agreed upon in 1984 to introduce some graduate courses in the curriculum of the M.Sc. Degree in Structural Engineering.
These courses are:

- 1- Earthquake Engineering**
- 2-Structural Dynamics**
- 3-Soil and Foundation Dynamics**

- **In the year 2000 the Graduate Curriculum has been completely modified. It included graduate EE- Related courses in different levels.**

M.Sc. Degree:

- 1- Engineering Seismology**
- 2-Seismic Structural Analysis**
- 3-Seismic Design of Buildings**
- 4-Geotechnical Earthquake Engineering**
- 5-Selecte Topics in Earthquake Engineering**

Ph.D. Degree

- Soil and Foundation Dynamics**

Higher Diploma In Earthquake Engineering
(Second year)

- 1-Introduction to Earthquake Engg**
- 2- Structural Design of Masonry**
- 3-Seismic Design Regulations**
- 4- Seismic Risk Assessment**
- 5- Field Investigation of Earthquakes**
- 6- Earthquake Disaster Management**
- 7- Project**

- In 2007 a special Diploma in Earthquake Engineering (Mitigation of Earthquake Disasters) has started as an agreement between the Faculty of Engineering, Cairo University and the Egyptian Society for Earthquake Engineering.

First Year Courses:

- 1- Introduction to Earthquake Engineering
- 2-Regulations of Earthquake –Resistant Design.
- 3-Earthquake Field Studies.
- 4-Computer Applications.
- 5-Methods of Research and Report Preparation

Second Year Courses:

- 1- Advanced Structural Analysis
- 2- Structural Dynamics
- 3- Design of Structural Engineering Software
- 4- Seismic Risk Assessment
- 5- Management of Earthquake Disasters
- 6- Project

On the Undergraduate Level

1996 Curriculum (Optional Courses)

- Earthquake Engineering
- Structural Dynamics

2003 Curriculum (Optional Courses):

- Introduction to Earthquake Engineering
- Structural Dynamics

Graduation Projects

Year	No. of Student	Subject
1992	7	Seismic Analysis
1994	6	Risk Assessment of Buildings & Urban Areas
1995	5	Seismic Vulnerability & Risk Evaluation
1996	3	Seismic Design of Buildings
1997	8	Vibration Measurements in Buildings

Impact

- **Almost all Egyptian Universities have introduced Earthquake Engineering Courses in their undergraduate and graduate curricula .**

Earthquake Engineering Research

Cairo University Theses

- 1984, First M. Sc. Thesis in EE
 - 1988, First Ph. D. Thesis in EE
- Supervised by Sobaih

No.	University	No. of Theses
1	Cairo	141
2	Ain Shams	38
3	Alexandria	13
4	Assiut	10
5	Mansoura	10
6	Zagazig	14
7	Helwan	9

No.	University	No. of Theses
8	Suez Canal	2
9	Tanta	6
10	Minia	-
11	Minoufia	2
12	Banha	9
13	Al-Azhar	5
Total		259

Published Papers by Egyptian Researchers

No.	University	No. of Journal Papers	No. of Conference Papers
1	Cairo	43	47
2	Ain Shams	73	94
3	Alexandria	17	50
4	Assiut	22	3
5	Mansoura	5	13
6	Zagazig	-	-
7	Helwan	47	14
8	Suze Canal	9	3

(Cont.) Published Papers by Egyptian Researchers

No.	University	No. of Journal Papers.	No. of Conference Papers
9	Tanta	-	-
10	Minia	-	3
11	Minoufia	3	4
12	Banha	-	-
13	Al-Azhar	62	60
	Total	281	291
Total		572	

(Cont.) Published Papers by Egyptian Researchers

Other institutions	No. Conference Papers.
Military Tech. College	25
ESEE	78
Other Conferences	18

Total No. of published papers = 693

Note :

- 1980 : First published paper by Sobaih

Egyptian Society for Earthquake Engineering

- **Established in 1983 by Sobaih and his colleagues at Cairo University.**
- **In 1988 : prepared Regulations for Earthquake Resistant Design of Buildings in Egypt .**
- **1990 : Official design codes have introduced, for the first time, the effect of Earthquake loads.**

ESEE Conferences

No.	Date	Conference title
1	Dec.,1993	First Egyptian Conference on EE(EGYQUAKE 1)
2	Dec.,1994	First Cairo EE Symposium(Seismic Risk Assessment)
3	Dec.,1995	Second Cairo EE Symposium(Seismic Design Codes)
4	Nov.,1997	Second Egyptian Conference on EE(EGYQUAKE 2)
5	Dec.,1997	19 TH European Regional EE Seminar
6	Nov.2000	Third Cairo EE Symposium (Earthg. Preparedness & Response & Design Codes.
7	Dec.,2004	Third Egyptian Conference on EE(EGYQUAKE 3)

AFPS WORKSHOP

Acropolis, Nice – Friday 13 June 2008

Other Activities by ESSEE

- 15 Training courses
- Many seminars addressing researchers & public
- 2005-2007 :Associate Member in the (HEEPF) project entitled:
 - “Enhancing Earthquake Engineering Education”
- Performed Earthquake Field Investigations :
 - Cairo Earthquake , Oct. 12, 1992
 - Dahab Earthquake, Nov. , 1995.

Impact of ESEE Activities

- **Seismic Zoning Maps for Egypt , Syria & Sudan**
- **Development of official design codes**
- **Enhancing Public and Engineers perception of Earthquake Resistant Design and Rehabilitation of existing buildings**

Conclusions

- **Pioneering and Sustained Efforts during the last 30 years have resulted in introducing and enhancing the field of Earthquake Engineering in Egypt.**
- **More efforts are still needed to keep this momentum in order to make sure that engineers understand and apply recent trends in earthquake engineering.**



Thank You