SASPARM

Support Action for Strengthening
Palestinian-administrated Areas
capabilities for seismic Risk Mitigation

SEVENTH FRAMEWORK PROGRAMME

www.sasparm.ps

Call ID FP7-INCO.2011-6.2

CSS

compact seismic simulator

SASPARM

Support Action for Strengthening
Palestinian-administrated Areas
capabilities for seismic Risk Mitigation

The SASPARM Project

The project aims to reinforce the cooperation with Europe's neighbours in the context of the European Research Area. The An-Najah National University (NNU) in the Palestinian-administered Areas (PS) is coordinating the project with the support of the European Centre for Training and Research in Earthquake Engineering (EUCENTRE) and the Institute for Advanced Study of Pavia (IUSS) in Italy.

The project activities are identified with the goal to create a research infrastructure and to develop and enhance international cooperation with PS in the field of scientific technology and capacity building, i.e. human resources, research policy, networks of researchers and research institutes. In an international framework the proposed activities will lead NNU to a fruitful cooperation with European Union (EU).

At national level an enhancement of capability will ensure PS to gain a centre prepared to respond to earthquake engineering and engineering seismology needs of the local community. The latter target will be pursued by enhancing the capability of NNU for training activity in the field of earthquake engineering. Furthermore, a higher visibility of NNU will encourage researchers to compete internationally in terms of scientific excellence (e.g., acquiring and participating in EU Framework projects related to seismic risk reductions) and increase their incentives to continue their research activities in PS.

Course Objectives

The course modules aim at increasing the role of NNU in the field of seismic risk mitigation in the national, regional and international panorama. Training modules and exchange of knowledge for NNU personnel, young students and practitioners will be fundamental ingredients for increasing the project visibility and improving the competitiveness of all partners. In addition, the reinforced research capacities of NNU will allow the organisation of effective training in local community on disaster risk reduction and emergency preparedness.

The SASPARM training modules have been organised taking direct advantage of the long experience of IUSS and EUCENTRE running international level Doctoral and Master Programmes in Earthquake Engineering and Engineering Seismology, with (Erasmus Mundus – MEEES Programme, www.meees.org) and without (Understanding and Managing Extremes, UME School, www.umeschool.it) mobility.

Who can benefit from the courses?

There are two types of courses: i) courses for practitioners and ii) courses for young researchers and students. The courses scheduled for young researchers and students are also open to practitioners.

Project coordinator

Dr. Jalal Al Dabbeek
An-Najah National University (NNU)

Lecturers

Dr. Jalal Al Dabbeek
An-Najah National University (NNU)

Dr. Barbara Borzi
European Centre for Training and Research in Earthquake Engineering (EUCENTRE)

Prof. Carlo G. Lai
European Centre for Training and Research in Earthquake Engineering (EUCENTRE)
University of Pavia, Department of Civil and Architectural Engineering

Dr. Simone Peloso
European Centre for Training and Research in Earthquake Engineering (EUCENTRE)

Dr. Paola Ceresa
UME School, Institute for Advanced Study of Pavia (IUSS)

Dr. Alessandro Dazio
UME School, Institute for Advanced Study of Pavia (IUSS)

Dr. Maria-Daphne Mangriotis
European Centre for Training and Research in Earthquake Engineering (EUCENTRE)
Heriot-Watt University

Visit

www.sasparm.ps
www.najah.edu
www.eucentre.it
www.iusspavia.it

Course
Modules for Practitioners

MODULE 1 **Fundamentals of seismic analysis and seismic design**
Lecturer **Dr. Barbara Borzi**

Day 1

09.00-10.30 Fundamentals of seismology
10.30-11.00 *Coffee break*
11.00-12.30 Seismic hazard in Palestine
12.30-14.30 *Lunch break*
14.30-16.00 Single Degree of Freedom System (SDOF)
16.00-16.30 *Coffee break*
16.30-18.00 Elastic Response Spectrum – Site effects EC8

Day 2

09.00-10.30 Fundamentals of ductility and Inelastic Response Spectra
10.30-11.00 *Coffee break*
11.00-12.30 Conceptual seismic design
12.30-14.30 *Lunch break*
14.30-16.00 Seismic Analysis
16.00-16.30 *Coffee break*
16.30-18.00 Capacity Design of Buildings

Day 3

09.00-10.30 Assignment 1
10.30-11.00 *Coffee break*
11.00-13.00 Assignment 2

MODULE 2 **Seismic design according to codes used in Palestine (UBC 97, Jordanian Seismic Building Code)**
Lecturer **Dr. Jalal Al-Dabbeek**

Day 1

09.00-10.30	Seismic hazard according to code regulations
10.30-11.00	*Coffee break*
11.00-12.30	Seismic site effect according to code regulations
12.30-14.30	*Lunch break*
14.30-16.00	Seismic forces and building codes. Equivalent lateral force method according to code regulations
16.00-16.30	*Coffee break*
16.30-18.00	General note about geotechnical and foundation, seismic design considerations

Day 2

09.00-10.30	The influence of architectural and structural configuration on seismic performance of buildings
10.30-11.00	*Coffee break*
11.00-12.30	Application on the seismic vulnerability of Palestinian common buildings
12.30-14.30	*Lunch break*
14.30-16.00	Assignment 1
16.00-16.30	*Coffee break*
16.30-18.00	Assignment 2

Day 3

09.00-10.30	Assignment 3
10.30-11.00	*Coffee break*
11.00-12.30	Assignment 4
12.30-14.30	*Lunch break*
14.30-16.00	Structural details
16.00-16.30	*Coffee break*
16.30-18.00	Special topics on earthquake engineering (seismic retrofit and upgrading fundamentals,..etc)

Course
Modules for young researchers and students

MODULE 1 **Fundamentals of seismic vulnerability and seismic risk**
Lecturers **Dr. Jalal Al-Dabbeek, Dr. Barbara Borzi, Dr. Paola Ceresa**

Day 1

09.00-10.30	Concepts of vulnerability
10.30-11.30	Mathematical definitions of vulnerability and risk
11.30-14.30	Application 1, Application 2, Application 3, Application 4, and Application 5

MODULE 2 Fundamentals of structural dynamics
Lecturer **Dr. Alessandro Dazio**

Day 1

09.00-10.30 Introduction. SDoF systems: Equation of motion and modelling
10.30-11.00 *Coffee break*
11.00-12.30 Free vibrations
12.30-14.30 *Lunch break*
14.30-16.00 Assignment 1
16.00-16.30 *Coffee break*
16.30-18.00 Assignment 1

Day 2

09.00-10.30 Harmonic excitation
10.30-11.00 *Coffee break*
11.00-12.30 Transfer functions
12.30-14.30 *Lunch break*
14.30-16.00 Forced vibrations
16.00-16.30 *Coffee break*
16.30-18.00 Forced vibrations

Day 3

09.00-10.30 Seismic excitation (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Seismic excitation (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Assignment 2
16.00-16.30 *Coffee break*
16.30-18.00 Assignment 2

Day 4

09.00-10.30 MDoF systems: Equation of motion
10.30-11.00 *Coffee break*
11.00-12.30 Free vibrations
12.30-14.30 *Lunch break*
14.30-16.00 Damping
16.00-16.30 *Coffee break*
16.30-18.00 Forced vibrations

Day 5

09.00-10.30 Seismic excitation (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Seismic excitation (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Assignment 3
16.00-16.30 *Coffee break*
16.30-18.00 Assignment 3

Module 2
Module 2

MODULE 3 Ground response analyses and near-surface site characterization

Lecturers **Prof. Carlo G. Lai and Dr. Maria-Daphne Mangriotis**

Day 1

09.00-10.30 Fundamentals of wave propagation (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Fundamentals of wave propagation (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Ground response analyses (Part 1)
16.00-16.30 *Coffee break*
16.30-18.30 Case study and exercising

Day 2

09.00-10.30 Ground response analyses (Part 2)
10.30-11.00 *Coffee break*
11.00-12.30 Near-surface site characterization using seismic methods (invasive techniques)
12.30-14.30 *Lunch break*
14.30-16.00 Near-surface site characterization using seismic methods (non-invasive techniques)
16.00-16.30 *Coffee break*
16.30-18.30 Review of Fourier analysis and discrete inverse theory

Day 3

09.00-10.30 Seismic prospecting using active SASW/MASW techniques (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Seismic prospecting using active SASW/MASW techniques (Part 2)
12.30-14.30 *Lunch break*
14.30-15.30 Seismic prospecting using passive MASW, ReMi and H/V techniques
15.30-16.45 Case study using real and synthetic geophysical seismic data

MODULE 4 Basic of signal processing, design of a specimens, system acquisition

Lecturer **Dr. Simone Peloso**

Day 1

09.00-10.30 Basic of Sensor and Transducers (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Basic of Sensor and Transducers (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Description of Actuation Systems (Part 1)
16.00-16.30 *Coffee break*
16.30-18.00 Description of Actuation Systems (Part 2)

Day 2

09.00-10.30 Description of Actuation Systems (Part 3)
10.30-11.00 *Coffee break*
11.00-12.30 Analysis of Signal (Part 1)
12.30-14.30 *Lunch break*
14.30-16.00 Analysis of Signal (Part 2)
16.00-16.30 *Coffee break*
16.30-18.00 Analysis of Signal (Part 3)

Day 3

09.00-10.30 Scaling Strategy (Part 1)
10.30-11.00 *Coffee break*
11.00-12.30 Scaling Strategy (Part 2)
12.30-14.30 *Lunch break*
14.30-16.00 Testing Strategy (Part 1)
16.00-16.30 *Coffee break*
16.30-18.00 Testing Strategy (Part 2)

The researchers of NNU with the support of Eucentre and IUSS will train students, also with the support of the new laboratory equipment, to understand the dynamic of structures. A comparison of experimental response of a specimen prepared by NNU personnel will be compared with the analytical responses computed, for example, with Matlab.