• ROSE FACULTY

Aiming at a unique diversity of teaching and research training in the field of Earthquake Engineering, the organisation of the ROSE Programme is based on a relatively short permanence of scholars with extremely high qualification. Indeed, all lecturers at the Programme are internationally recognised experts in the field, coming from a number of distinguished institutions.

Director
G.M. Calvi

Emeritus Director
M.J.N. Priestley

Teaching Body

N. Abrahamson
S. Akkar
R. Archuleta
F. Auricchio
J. Berrill
K. Beyer
J.J. Bommer
D.M. Boore
R. Boroschek
F. Brezzi
A. Carr
C. Christopoulos
M. Cocco
M.P. Collins
J. Conte
H. Crowley
M. Cubrinovski
A. Dazio
A. Der Kiureghian
R. DesRoches
A. Elghazouli
A. Elnashai
M. Erdik
E. Faccioli
M.N. Fardis
G.L. Fenves
A. Filiatrault
P. Franchin
P. Gamba
M.C. Griffith
P. Gülkan
R. Herrmann
T.J.R. Hughes
H. Igel
E. Kausel
E. Kavazanjian
K. Kawashima
M.J. Kowalsky
S. Kramer
C.G. Lai
R. Leon
C. Lovadina
R. Madariaga
G. Magenes
E. Miranda
G. Monti
F. Naeim
M. Nakashima
S. Nielsen
S. Otani
M. Pagani
S. Pampanin
R. Paolucci
A.S. Papageorgiou
A. Pavese
A. Pecker
M. Pender
J. Pettinga
R. Pinho
P.E. Pinto
C. Prato
J.H. Prevost
G. Rassati
E. Rathje
A. Reali
J. Restrepo
G. Rix
C. Scholz
D. Slejko
E. Spacone
J. Stanton
J.P. Stewart
H. Sucuoglu
T. Sullivan
J. Swanson
T. Triantafillou
G. Valensise
K. Wilmanski

The IUSS-Pavia is the last step of a long lasting higher education process started on 825 when King Lotharius appointed Pavia, the ancient capital of the Lombard kingdom, as the site for higher education of his kingdom. This process went through the foundation in 1361 by Emperor Charles IV of the Studium Generale later on named University of Pavia. The first Colleges for university students were established in the 15th and 16th centuries. They are now 15 offering, to the almost 2.000 students, a unique opportunity of study and cultural enrichment in a multidisciplinary and multiethnic environment. Through centuries the University of Pavia became one of the leading institutions in Europe.

IUSS fulfils, since 1997, an advanced teaching and research model successfully implemented by other prestigious institutions in Italy, like the Scuola Normale Superiore and the Scuola Sant'Anna in Pisa. Due to the completeness of its education and training fields, which allows a strong interdisciplinary approach, the mission of IUSS is that of contributing to the growth of a small number of selected students by offering them, at any step of their higher education, qualified programs enhancing their capabilities and knowledge. The Institute is also committed to scientific progress by preparing young researchers and developing scientific research programs.

UME School
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Education and Culture

Erasmus Mundus

The European Commission has approved and financed within the Erasmus Mundus II the Masters in Earthquake Engineering and Engineering Seismology (MEEES), coordinated by the UME School and featuring also the participation of the University of Grenoble Joseph Fourier (France), the University of Patras (Greece) and the Middle East Technical University (Turkey), which aims to enhance quality in European higher education and to promote intercultural understanding through co-operation with third countries, a number of scholarships are available for both non-European as well as European students. Interested applicants are invited to visit the MEEES website (**www.meees.org**) for detailed information and instructions on financial conditions and application procedures.

Design Eucentre - **Pavia, Italy**

Università degli Studi di Pavia

CAR - Collegio Cardinal Riboldi

IUSS Sapere Aude
Istituto Universitario di Studi Superiori Pavia

The Twelfth International ROSE Seminar

Collegio Cardinal Riboldi
Pavia, Italy
17-18 May 2012

UME Graduate School
understanding and managing extremes

PAVIA RISK CENTRE

• THE UME SCHOOL

The postgraduate school in Understanding and Managing Extremes (UME) is a new exciting development of the IUSS Pavia (Institute for Advanced Study of Pavia, **www.iusspavia.it**), a higher education institution in Italy that offers international advanced postgraduate programmes (Masters and Doctorate). Innovative, internationally planned, open minded, grown on the traditionally fertile soil of the University of Pavia, and based on a system of Colleges unique in Italy, the IUSS prepares brilliant individuals to take on the most challenging and demanding public and private posts in contemporary Italy, Europe, the Mediterranean area and the rest of the world.

In this framework, the UME School offers graduate programmes geared towards the evaluation of uncertainties, risk mitigation and emergency management. The key objective is to provide a system within which Masters and Doctoral candidates can study, understand and deal with extreme events. The UME programmes currently focus on three main areas:

Disaster risk assessment, focusing mainly on natural hazards such as earthquakes hurricanes, fires, landslides and floods (with possible extensions to the topics of climatology, desertification, human-made and technological risks etc.).

Extreme situation management, which includes topics of statistics and probability, law, economics, resource management, finance, insurance, sociology, ethics, psychology and medicine.

Engineering for risk mitigation, which includes topics on engineering to increase the capacity of buildings and infrastructure to withstand the demands from extreme events.

At the UME School each course is intensively taught in a period of one to four weeks, during which the respective lecturer is able to fully dedicate his/her time and efforts exclusively to the scholastic activities at the school, thus ensuring teaching and research training at the highest possible levels of quality. All of the above endows a truly unique character to the UME School, be it for its fully international nature or for its innovative organisation in education and research training in the fields of evaluation of uncertainties, risk mitigation and emergency management.

Currently the UME School runs Masters and Doctoral Programmes in Earthquake Engineering and Engineering Seismology (ROSE) and Risk and Emergency Management (REM).

• THE ROSE PROGRAMME

The ROSE Programme (formerly ROSE School) provides higher-level education in the field of earthquake engineering, offering a number of courses covering applied mechanics, structural engineering, earthquake engineering, engineering seismology and soil dynamics, with emphasis on both theoretical background and design considerations.

In addition to the PhD Degree, the programme offers Masters Degrees in earthquake engineering and engineering seismology **with** (**www.meees.org**, see the Erasmus Mundus paragraph overleaf) and **without** (**www.roseschool.it**) mobility, the latter being jointly awarded by the IUSS and the University of Pavia.

• INTERNATIONAL ROSE SEMINARS

As a part of the ROSE Programme, an International Seminar is organised every year, to provide the students of the Programme with an opportunity to present and discuss their research work to an audience of international experts.

In addition to standard presentations on research work carried out within the Programme, the annual Seminars feature also the tradition of inviting a prominent scientist to deliver a keynote lecture on a given contemporary and highly relevant topic in the field of Earthquake Engineering. At this year's event, the keynote address entitled "Earthquake design of foundations: recent developments from research to practice" will be delivered by Professor Alain Pecker of École des Ponts ParisTech, France.

It is also foreseen that contributions to the seminar will be published, after a standard review process, in a special issue of the Journal of Earthquake Engineering, which will be distributed to all participants and journal subscribers in early 2013. Copies of the JEE Special Issues containing the proceedings of previous editions of this annual Seminar are available from the UME School Secretariat, on request.

• ATTENDING THE EVENT

In addition to UME faculty and students, a maximum of 50 external participants may also be accepted, for which reason professionals and researchers worldwide are encouraged to take part in the event. A 160€ fee is required from external attendees, to cover for the cost of coffee/lunch breaks, seminar dinner and proceedings. Special financial conditions are, however, in place for University researchers or students, to whom a fee of not more than 120€ is usually requested.

Those who wish to attend the Seminar are kindly invited to compile and submit the registration form to the UME School Secretariat, at the address given overleaf. If you need assistance of any kind (registration form, accommodation, travelling directions, etc.), please do not hesitate in contacting our staff at **secretariat@umeschool.it**. You may also refer to the UME website (**www.umeschool.it**) for further information on all UME School activities.

• VENUE

The UME School is located at the European Centre for Training and Research in Earthquake Engineering (EUCENTRE, **www.eucentre.it**), in Pavia, a historical town in the North of Italy (35 km from Milan), full of University tradition and fame.

The Seminar itself will take place at the Collegio Cardinal Riboldi (CAR College, **www.collegioriboldi.it**), a landmark structure dating back to the second half of the seventeenth century, purposely-refurbished to serve as an international hosting facility for postgraduate students and visiting scholars working in the field of natural risk mitigation. It is located in the centre of Pavia, in Via Luigi Porta 10.

UME Graduate School

Understanding and managing extremes

• PROGRAMME OF THE SEMINAR

Thursday, 17th May

13.00 – 14.30 Welcome lunch and registration

14.30 – 16.00 **Session 1 - Chairman: A. Dazio**

Design of mixed MRF systems allowing for the influence of hysteretic behaviour on seismic response
T. Maley[2], T. Sullivan, S. Pampanin

Evaluation of the shear strength capacity of precast-prestressed hollow core floor slabs
E. Brunesi[1], D. Bolognini, R. Nascimbene

Behaviour of reinforced concrete panels subjected to reversed-cyclic shear loads
D. Ruggiero[1], E. Bentz, M. Collins

16.00 – 16.30 *Coffee break*

16.30 – 18.00 **Session 2 - Chairman: T. Sullivan**

Seismic behaviour assessment of a timber structure: numerical modeling and experimental results
V. Fort[1], S. Peloso, A. Pavese

Analytical assessment of the seismic response of Double Concave Sliding Surface based isolation systems under bi-directional motion
M. Furinghetti[3], A. Pavese, C. Casarotti

Secondary dynamic torsion in structural systems
M. Masoudi[1], P. Gülkan, A. Dazio

19.30 – 23.30 *ROSE Seminar Dinner*

Friday, 18th May

09.00 – 11.00 **Session 3 - Chairman: G. Magenes**

Accounting for progressive damage in SP-BELA method
P.C. Miglietta[3], B. Borzi, P. Ceresa, R. Iaccino

Physical and numerical modeling in slope stabilization with large diameter shafts
A.G. Ozcebe[1], C.G. Lai

Some critical issues on the seismic modelling and analysis of irregular RC buildings
R. Sousa[1], R. Pinho, R. Nascimbene

Developing Direct Displacement-Based Design and assessment procedures for simplified Performance-Based Earthquake Engineering
D. Welch[3], T. Sullivan, G.M. Calvi

11.00 – 11.30 *Coffee Break*

11.30 – 13.15 **Session 4 - Chairman: A. Pavese**

Identification of displacement-based damage levels from nonlinear dynamic analyses of masonry buildings
A. Mouyiannou[1], M. Rota, A. Penna, G. Magenes

Experimental seismic response of unreinforced stone masonry buildings
I. Senaldi[1], G. Magenes, A. Penna, M. Rota, A. Galasco

Force-deformation relationships for masonry spandrels with arches
S. Mangalathu[3], K. Beyer

Numerical modelling of earthen structures: Actual knowledge and needs for research
N. Tarque[2], G. Camata, E. Spacone, H. Varum, M. Blondet

13.15 – 14.30 *Lunch break*

14.30 – 16.30 **Session 5 - Chairman: G.M. Calvi**

Keynote lecture - Earthquake design of foundations: recent developments from research to practice
Alain Pecker

Overview of 2011-2012 Eucentre Activities

ROSE/MEEES Graduation Ceremony

Award of the ROSE Prize 2012

[1] PhD Student, [2] PhD Alumnus, [3] MSc Student