ANNEX 25-DICA-M2-564

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Art. 1 - Type

The University of Pavia has activated a **second level Post-Master Vocational Program** in **Earthquake Engineering** at the **DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE** in partnership with **Istituto Universitario di Studi Superiori (IUSS)** of Pavia, for the 2025/26 academic year.

The operation and organizational and administrative-accounting management of the Vocational Program will be provided by the **"European Centre for Training and Research in Earthquake Engineering (EUCENTRE)"** Foundation.

Edition: 1

Disciplinary area: SCIENTIFIC AND TECHNOLOGICAL AREA

Art. 2 - Training objectives, job opportunities and course appeal

The Vocational Program in Earthquake Engineering **aims to train profiles with strong scientific and professional skills, having developed awareness of the cultural, technical and managerial contents of Earthquake Engineering**. The main areas of study include aspects relating to:

- geotechnical
- seismology
- behaviour of materials and structures
- structural analysis
- design of new structures
- retrofitting of existing structures.

In addition, special emphasis will be placed on the (i) study of data acquisition methods and investigation methods for materials, technologies and structures, (ii) study of hazards and vulnerabilities to calculate risk, including for insurance and financial purposes, (iii) techniques for safeguarding elements and structures, and (iv) aspects related to sustainability and expected losses.
The professional profile trained as part of the Vocational Program in Earthquake Engineering can find employment in the following sectors:

- international structural design companies;
- international construction companies;
- companies producing building components and technological elements (isolators, dissipators, composite materials, monitoring instruments)
- national and regional civil protection bodies
- public authorities
- local authorities and non-governmental organisations
- universities and research institutions in Italy and abroad
- large insurance, reinsurance and brokerage companies
- banking institutions and property management companies.

Art. 3 - Program's curriculum

The **one-year** Vocational Program comprises a total of 1,500 hours, broken down according to the table below.

The set of planned training activities is designed to enable course participants to acquire **60 university credits** (CFU).

The teaching modules are organized as follows and will be **taught in English**:

Module	SSD	Lenguage	L(h)	STD(h)	OL(h)	EX(h)	Tot(h)	CFU
1) Probability and Statistics for Engineering Applications	CEAR-07/A | Structural Analysis and Design	English	12	45	0	18	**75**	**3**
	Contents: This course will attempt to cover some fundamental aspects of probability and statistics, focusing on practical issues and concepts rather than mathematical demonstrations. During the first part of the course, the concepts and definitions of random variables, along with their various associated functions, will be introduced. Next, the course will focus on the most commonly used probability distribution functions in civil engineering. The final part of the course will cover topics in statistics and sampling, including goodness-of-fit tests, regression analysis, estimation of distribution parameters based on statistical data, and hypothesis tests and their interpretation. Finally, the basic concepts of Monte Carlo simulation and an overview of variance reduction techniques will be discussed.							
2) Seismic Hazard and Engineering Seismology	GEOS-04/A | Solid Earth Geophysics	English	24	90	0	36	**150**	**6**
	Contents: The course aims to provide students with the essential knowledge and skills to tackle the most common problems of seismology in engineering and applied geophysical practice. The course consists of two main modules. The first module will cover topics of engineering interest, including intensity measurements, ground motion prediction equations, earthquake recurrence analysis, seismotectonics and seismic hazard assessment (deterministic and probabilistic). In the second module, concepts of theoretical seismology will be introduced, with a focus on wave propagation and seismic source representation.							
3) Dynamic Analysis of Structures	CEAR-07/A | Structural Analysis and Design	English	12	45	0	18	**75**	**3**
	Contents: The course aims to allow the participants to gain further insights into structure dynamics by studying the vibration characteristics and dynamic response of structural systems to dynamic excitations generated by earthquakes, wind, impacts and explosions. At the end of the course, the students will have a basic understanding of the following topics: • discrete one-DOF (degree-of-freedom), multi-DOF and continuous vibration systems • free and forced vibration response of discrete and continuous systems • applications in structural design.							
4) Fundamentals of Seismic Response and Design	CEAR-07/A | Structural Analysis and Design	English	24	90	0	36	**150**	**6**
	Contents: The course will provide an overview of the key aspects of the dynamic behaviour of linear and nonlinear one-DOF (degree-of-freedom) systems, forming the basis for an understanding of seismic design. Subsequently, the concepts of seismic design of structures will be covered. The core of the course will be a discussion of force-based (widely adopted) and displacement-based (under development) seismic design philosophies, with a focus on the tools and steps required for their application and verification. The principles of capacity design, which are fundamental to ensuring a predetermined hierarchy of ductile plastic deformations, will be explained. Special attention will be paid to the design and construction details of reinforced concrete structures in accordance with Eurocode 8 and other regulations and guidelines. Further attention will be devoted to the characterisation of the force-strain behaviour of reinforced concrete structural elements, as well as to the modelling and analysis of reinforced concrete structures using non-linear finite element approaches.							
5) Nonlinear Response Analysis	CEAR-07/A | Structural Analysis and Design	English	24	90	0	36	**150**	**6**
	Contents: The course will focus on gaining an advanced understanding of the nonlinear behaviour of structures under static and dynamic loads, with special emphasis on seismic loading. The lectures will cover advanced theoretical concepts of linear and nonlinear structural analysis, with a focus on constitutive material formulations, transformations for second-order geometric analysis and alternative elements for nonlinear analysis, including beam-column and link elements. State-of-the-art modelling techniques, particularly for steel and reinforced concrete structures, will be presented and applied through examples and exercises.							
6) Seismic Design of Steel Structures	CEAR-07/A | Structural Analysis and Design	English	12	45	0	18	**75**	**3**
	Contents: This course will cover the fundamentals of seismic design of steel structures, starting with the mechanical properties of materials, with a focus on ductility. Next, the behaviour of structural elements, including stability, will be presented. Bolted and welded connections will be analysed, and limit analysis will be introduced. In the final part of the course, strength and ductility aspects in seismic design will be dealt with, covering the design with dissipative elements of MRF structures, with concentric and eccentric bracing.							

7) Seismic Assessment of Masonry Structures	CEAR-07/A | Structural Analysis and Design	English	12	45	0	18	**75**	**3**
	Contents: The aim of this course is to provide an introduction to materials, construction practices, structural behaviour, analysis methods and the main regulatory requirements for the seismic design of masonry buildings, as well as for the seismic assessment and adaptation/improvement of existing buildings.							
8) Risk Assessment and Loss Estimation	CEAR-07/A | Structural Analysis and Design	English	24	90	0	36	**150**	**6**
	Contents: The first part of the course will aim to introduce the basic concepts of risk assessment and loss estimation for assets exposed to natural events such as earthquakes and tropical cyclones. In addition, the fundamentals of seismic hazard analysis will be covered, with both probabilistic and deterministic approaches. The course will then focus on the theory of catastrophic risk modelling for a range of structures, with special emphasis on earthquakes. However, tropical cyclones will also be touched upon. The applications discussed will mainly pertain to the insurance and reinsurance sectors. Next, seismic risk concepts for individual structures will be presented and compared with the approach taken for a portfolio of assets. The second part of the course will involve applying the theory of seismic risk assessment to real case studies. During this stage, reliance will be made on models that have already been developed, with a view to learning how to calculate and interpret the results. Finally, the third and last part of the course will explore in detail the more advanced approach for seismic risk assessment of individual buildings, both in terms of collapse and loss estimation. The techniques learnt will be applicable to both the design of new buildings and the assessment of existing buildings.							
9) Retrofit Strategies for RC Buildings	CEAR-07/A | Structural Analysis and Design	English	12	45	0	18	**75**	**3**
	Contents: This course aims to provide students with basic knowledge of seismic assessment procedures, retrofitting strategies and techniques applicable to reinforced concrete buildings. By the end of this short course, students will have become familiar with: • the concepts and general principles underlying seismic assessment and retrofitting strategies, according to a performance-based approach • existing national and international literature on seismic assessment and retrofitting, based on experimental, numerical and analytical studies and observations/reports from post-earthquake reconnaissance missions • the general potential and limitations of different structural retrofitting solutions, both based on traditional techniques and more recent methodologies.							
10) Bridge Structures	CEAR-07/A | Structural Analysis and Design	English	24	90	0	36	**150**	**6**
	Contents: This course aims to provide students with an in-depth knowledge of the bridge design process, starting from conceptual design through to the detailed design of individual components. The course is also designed to help students understand the transmission mechanism of applied loads, such as heavy traffic loads, impacts, horizontal braking/centrifugal forces, wind and seismic loads on bridges.							
11) Geotechnical Earthquake Engineering	CEAR-05/A | Geotechnical Engineering	English	12	45	0	18	**75**	**3**
	Contents: This course aims to introduce students to the fundamental theories and methods of seismic geotechnical engineering and soil dynamics. In particular, the following topics will be covered: propagation of mechanical waves in geomaterials, seismic soil response analysis, soil liquefaction, seismic instability of slopes, superficial fault rupture, dynamic soil-structure interaction and seismic analysis of foundations and soil retaining systems.							
12) GEM Models, OpenQuake Engine and Tools Training	CEAR-07/A | Structural Analysis and Design	English	12	45	0	18	**75**	**3**
	Contents: Students will learn the fundamental concepts of seismic risk assessment, together with the basic features of the calculation engine of the OpenQuake open-source software. Classes will be broken down into sections, each covering a different type of calculation using OpenQuake-engine. Each section will involve a technical and practical approach, including theoretical introductions to the problem, guiding examples, and insights into the OpenQuake tools. The study sections refer to the introduction of OpenQuake, single earthquake scenarios with associated losses and damage, probabilistic seismic hazard assessment, risk analysis with calculation of annual losses per building portfolio.							
		PARTIAL	**204**	**765**	**0**	**306**	**1275**	**51**

Internship/Stage		English		**150**	**6**
Final exam		English		**75**	**3**
			TOTAL	**1500**	**60**
L ***Lectures;*** **STD** ***Study;*** **OL** ***Online lessons;*** **EX** ***Exercises, practical activities.***					

Internship/Stage

Training will be carried out at research or professional institutions affiliated with the Vocational Program. Training will be led by a tutor from the teaching staff and a tutor from the host institution. The activities to be carried out by the students will be agreed upon by the tutors.

Students will attend the **Nigel Priestley Seminar** free of charge.

The training period may not be suspended.

Transfers to similar Vocational Programs at other universities are not allowed.

Art. 4 - Progressive knowledge checks

Learning will be assessed by having students complete individual or group work and take a written test at the end of each teaching module.

Art. 5 - Final degree examination and achievement of qualification

The final examination involves preparing a **final report** on the conducted internship, performed under the guidance of a Vocational Program's lecturer. The candidate will then present the contents of this report in a special session before a panel of examiners. No mark or merit grade will be awarded for this examination.

At the end of the Vocational Program, participants who have completed all the activities and fulfilled all the requirements will be awarded the **second-level Post-Master Vocational Program's Diploma** in "**Earthquake Engineering**".

Art. 6 - Faculty

Teaching will be held by faculty from the University of Pavia, and from other universities e as well as by highly-qualified professional experts.

Art. 7 - Admission requirements

The Vocational Program is intended for students who have obtained a **Master's Degree**, in accordance with the Ministerial Decree No. 270/04, **in one of the following classes**:

- (LM-4) Master's Degrees in Architecture and building engineering
- (LM-4 c.u.) Master's Degrees in Architecture and building engineering (five-year course)
- (LM-23) Master's Degrees in Civil engineering
- (LM-24) Master's Degrees in Building systems engineering
- (LM-26) Master's Degrees in Safety engineering
- (LM-35) Master's Degrees in Environmental and land use engineering

The Vocational Program is intended for students who have obtained a **Master's Degree**, in accordance with the Ministerial Decree No. 509/99, **in one of the following classes**:

- (4/S) Master's Degrees in Architecture and building engineering
- (28/S) Master's Degrees in Civil engineering
- (38/S) Master's Degrees in Environmental and land use engineering

Diplomas **awarded under the previous system** that are **equivalent to the above-mentioned degrees** are also accepted.

Candidates holding a **degree obtained abroad deemed equivalent to the degree classes stated above** may also be admitted.

The maximum number of places available is **30**.

The minimum number of participants to activate the course is **7**.

The Academic Board will also be able to assess whether the conditions for expanding the maximum number of participants are met.

If the number of applicants exceeds the expected maximum, a selection committee comprising the Coordinator and two Faculty members will be formed to select applicants and create a merit list, expressed in **hundredths**. This list will be determined on the basis of the following evaluation criteria:

1) Up to a maximum of 50 points for qualifications submitted, broken down as follows:

- curriculum vitae et studiorum > max **30 punti**
- lettere di referenza (fino a un massimo di tre) > max **10 punti**
- ogni altro titolo o documento che possa qualificare l'esperienza accademica e/o professionale > max **5 punti**
- eventuali pubblicazioni scientifiche (con relativo elenco) > max **5 punti**.
- curriculum vitae et studiorum > max **30 points**
- reference letters (up to 3) > max **10 points**
- any other qualification or document qualifying the academic and/or professional experience > max **5 points**
- any scientific publications (with relevant list) > max **5 points**.

Only students who achieve a score of **at least 30 out of 50 points** will be eligible for the individual English interview.

2) Up to a maximum of 50 points for an individual interview in English aimed at assessing the candidate's skills, abilities and motivation in relation to the contents and specific objectives of the Master's course. Special emphasis will be placed on any professional experience in the field, curriculum vitae et studiorum and references from referees, if any. The interview may also be conducted using suitable IT tools that ensure the candidate's identification. For an interview to be considered successful, a score of **at least 35 out of 50 points** is required.

In case of equal merits, young age will prevail in the ranking. In case of withdrawal of one or more candidates, the vacant place/places will be made available to the next candidate in the ranking, up to the coverage of all available places.

AUDITING CLASSES

Admission to auditing classes is subject to the following criteria:

applicants are required to hold a **Bachelor's Degree**, pursuant to Ministerial Decree No. 270/2004 and under prior university systems, in any class/discipline. In addition, admission to the individual teaching module will be assessed by the Academic Board members on the basis of the auditor's professional profile and curriculum vitae.
Auditors may apply for admission to any module of the training course, for **a maximum of 12 credits and a minimum of 3 credits**.

The enrollment fee is **€ 125.00 per individual credit**, plus € 32.00 (two stamp duties) and € 200.00 (administrative expenses); participation does not include internship activities and the conduct of any examinations/final tests.

Auditors will receive a specific **certificate of attendance** related to the modules attended, without any credits being awarded.

Art. 8 - Deadline for the online application process

Applicants must submit their application for admission in accordance with the procedures, set out in the Call for Admission, from **31/07/2025** and by the deadline of **15/10/2025**.

All the requirements set out in the Call for Admission and this Annex must be met within the application deadline.

Art. 9 - Annexes for the online application process

Applicants must attach, during the online application, the scan of the following documentation:

1) **application form** (the form at the end of this Annex)
2) (front-rear) **personal identification document** inserted during registration
3) **reference letters** (up to a maximum of 3)
4) **CV** listing also professional experiences in working environments pertaining the above course, if any
5) **scientific publications** pertaining to the above course, if any

ONLY FOR APPLICANTS WITH AN ITALIAN ACADEMIC TITLE:
6) **self-declaration of the passed exams** during the academic career reading relevant marks

ONLY FOR APPLICANTS WITH A FOREIGN ACADEMIC TITLE:
6) **Academic qualification required for admission** issued in English/Spanish/French or officially translated in Italian
7) **Transcript of records** (list of and relevant marks) issued in English/Spanish/French or officially translated in Italian

And also, if already available:

- ***Declaration of Value (DoV)*** *issued by the Italian embassy/consulate*
- *or* ***CIMEA Statement of Comparability***
- *or* ***Diploma Supplement*** *(if the foreign qualification is issued by an european university)*
- ***Statement of Correspondence*** *which can be downloaded from the* ***Automatic Recognition Database (ARDI).***

The aforementioned documents must be uploaded within the period referred to in art. 8.

Please note that, as indicated in art. 3 of the Call for Admission to the Vocational Programs, **applicants holding a qualification obtained abroad must**, **by the enrollment deadline** according to the calendar published by the Organizational Secretary of the Vocational Program, **deliver the following documentation in original**:

1. Academic qualification required for admission issued in English/Spanish/French or officially translated in Italian

- **LEGALISED** by **the Italian embassy/consulate in your country** (legalisation is NOT required for Belgium, Denmark, the United Kingdom of Great Britain and Ireland, France, Ireland and Germany OR for documents with an electronic/digital means of ascertaining its authenticity as QR code/string code)
  PLEASE NOTE: legalisation must refer to the document not the translation
- or **APOSTILLED** (the apostille is **only available** for the signatory countries to the **Hague Convention**)
- or **ACCOMPANIED** by **CIMEA Statement of Verification**.

2. Transcript of records (list of and relevant marks) issued in English/Spanish/French or officially translated in Italian

3a. IF your title HAS NOT been obtained in one of the Countries that are signatories to the **Lisbon Recognition Convention**

- **Declaration of Value (DoV)** issued by the Italian embassy/consulate
- or **CIMEA Statement of Comparability**
- or **Diploma Supplement** (*if the foreign qualification is issued by an european university*).

3b. IF your title HAS been obtained in one of the Countries that are signatories to the **Lisbon Recognition Convention**

- **Statement of Correspondence** which can be downloaded from the **Automatic Recognition Database (ARDI).**

Enrollment to the Vocational Program will be finalized ONLY upon delivery of this documentation.

Art. 10 - Tuition and fees

Enrollment

Students enrolling in the Vocational Program, for the 2025/2026 academic year, must pay the amount of **€ 7.500**, including: € 16.00 (stamp duty) and € 200.00 (administrative fees).

This amount must be paid in **3 instalments:**

- 1° instalment of € **3,500**, to be paid **upon enrollment**
- 2° instalment of € **2,000**, to be paid by **30** of **May 2026**.

- 3° instalment of € **2,000**, to be paid by **30 September 2026**

External national or international organisations or bodies may contribute to the conduct of the master's course by providing scholarships for enrolment/internship attendance. Should such agreements be finalised, they will be posted on the Vocational Program's website, along with the award criteria.

Final exam

In order to be admitted to the final exam, candidates must submit a specific application form along with the payment of 116,00 as a fee for the issuance of the Vocational Program's Diploma (including n° 2 stamp duty tax of 16,00 paid virtually: one for the parchment and one for the application). The cost of the parchment could be updated by resolution of the Board of Directors after the publication of this notice.

Exemptions or scolarships

The following institutions will provide support to the Vocational Program through the provision of scholarships:

- "European Centre for Training and Research in Earthquake Engineering (EUCENTRE)" Foundation
- "Global Earthquake Model (GEM)" Foundation.

Art. 11 - Website and Organizational Secretary contacts

Any communication and important information regarding candidates and students will be published on the following website:

https://rose-school.it

For information regarding the course organization:

Organizational Secretary

The Organizational Secretary will be based at:

Fondazione "European Centre for Training and Research in Earthquake Engineering" (EUCENTRE)
Via Adolfo Ferrata, 1 - 27100 Pavia (PV)
E: info@eucentre.it
T: +39 0382.5169811

The contact person is Saverio Bisoni.

UNIVERSITÀ DI PAVIA

Servizio Medicina
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APPLICATION FORM

to the II level POST-MASTER VOCATIONAL PROGRAM

EARTHQUAKE ENGINEERING

(this form, duly filled in, must be uploaded in the on-line procedure of admission to the Post-Master Vocational Program as per issue n°9 of the annex to the relevant call for admissions)

The undersigned (FORENAME, SURNAME) .....

Date of birth ..... City ..... State .....

State of residence ..... Permanent address .....

E-mail .....

APPLIES

for admission to the aforementioned Post-Master Vocational Program

and **UPLOAD**

the scan of the following documents **to be submitted mandatorily for the application evaluation**

1) front-rear of the **personal ID document/passport** uploaded during the on-line registration procedure

2) **reference letter**

3) **CV** listing also professional experiences in working environments pertaining the above course, if any

4) scientific publications pertaining to the above course, if any

ONLY FOR APPLICANTS WITH AN ITALIAN ACADEMIC TITLE

5) **self-declaration of the passed exams** during the academic career reading relevant marks

ONLY FOR APPLICANTS WITH A FOREIGN ACADEMIC TITLE

5) **academic qualification required for admission** issued in English/Spanish/French or officially translated in Italian

- **LEGALIZED** by the Italian embassy/consulate in your country (legalisation is not required for Belgium, Denmark, the United Kingdom of Great Britain and Ireland, France, Ireland and Germany OR for documents with an electronic/digital means of ascertaining its authenticity as QR code/string code)
  PLEASE NOTE legalization must refer to the document's contents not to the translation
- OR **APOSTILLED** (the apostille is only available for the signatory countries to the Hague Convention)
- OR **ACCOMPANIED by CIMEA Statement of Verification**

PLEASE NOTE it is not mandatory to have the Legalization/Apostille/Statement of Verificatio, if not available yet, during the online application, but it will be necessary to produce it in original and deliver it by the enrollment deadline.

6) **transcript of records** (list of and relevant marks) issued in English/Spanish/French or officially translated in Italian

7) **IF your title HAS NOT been obtained** in one of the Countries that are signatories to the Lisbon Recognition Convention

- **Declaration of Value (DoV)** issued by the Italian embassy/consulate
- OR **CIMEA Statement of Comparability**
- OR **Diploma Supplement** (if the foreign qualification is issued by an european university).

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IF your title HAS been obtained in one of the Countries that are signatories to the Lisbon Recognition Convention

- **Statement of Correspondence** which can be downloaded from the Automatic Recognition Database (ARDI)

PLEASE NOTE it is not mandatory to have the DoV/Statement of Comparability/Diploma Supplement/Statement of Correspondance if not available yet, during the online application, but it will be necessary to produce it in original and deliver it by the enrollment deadline.

Date .....

Signature .....