

PhD Programme Table - 38th cycle
NRRP “National Recovery and Resilience Plan” Call for Applications



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European Union**
NextGenerationEU



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Section “Available Positions and Scholarships” integrated on 13/07/2022

Section “Available Positions and Scholarships” integrated on 18/07/2022

Section “Available Positions and Scholarships” integrated on 27/07/2022

PROGRAMME’S NAME	CIVIL, CHEMICAL, ENVIRONMENTAL AND MATERIALS ENGINEERING
DURATION	3 years
PROGRAMME START DATE	01/11/2022 (DD/MM/YYYY)
LANGUAGES	Italian, English
COORDINATOR	Prof. Alessandro Tugnoli (a.tugnoli@unibo.it)
CURRICULA	1. Engineering of Infrastructure, Resources and Territory 2. Structural and Geotechnical Engineering 3. Chemical and Process Engineering 4. Materials Engineering and Industrial Biotechnology
RESEARCH TOPICS	Detailed list at the bottom of the present document
PhD POSITIONS	19
ADMISSION PROCEDURE	Qualifications and research proposal evaluation Oral examination

Available Positions and Scholarships

Pos. n.	Financial Support	Description	Positions linked to a specific research topic
1	PhD Scholarship Ex M.D. 351/2022 - NRRP Research	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 1, Investment 4.1 (MD 351/2022) – NRRP Research	One research topic of your choice among the following list: <ul style="list-style-type: none"> - Curriculum 1: Green Revolution and Ecological Transition in Engineering of Infrastructure, Resources and Territory - Curriculum 2: Green Revolution and Ecological Transition in Structural and Geotechnical Engineering - Curriculum 3: Green Revolution and Ecological Transition in Chemical and Process Engineering - Curriculum 4: Green Revolution and Ecological Transition in Materials Engineering and Industrial Biotechnology

2	PhD Scholarship Ex M.D. 351/2022 - NRRP Research	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 1, Investment 4.1 (MD 351/2022) – NRRP Research	One research topic of your choice among the following list: <ul style="list-style-type: none"> - Curriculum 1: Green Revolution and Ecological Transition in Engineering of Infrastructure, Resources and Territory - Curriculum 2: Green Revolution and Ecological Transition in Structural and Geotechnical Engineering - Curriculum 3: Green Revolution and Ecological Transition in Chemical and Process Engineering - Curriculum 4: Green Revolution and Ecological Transition in Materials Engineering and Industrial Biotechnology
3	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by Fondazione ITL	Methods and models for the analysis of innovative, sustainable and resilient freight transport systems
4	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by GECOSistema srl	Innovative sub-grid DEM-based inundation modelling for flood hazard and risk intelligence and mapping in urban and peri-urban areas
5	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by ONDAPLAST S.p.A.	Study of new formulations based on biopolymers, to replace traditional polymers, for application in packaging and in strategic sectors Sustainable polymers: study of formulations for applications in packaging and strategic sectors
6	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by Sismo Solution	Study and development of new mechanical dissipative devices for the reduction of the seismic risk for structural and non-structural elements
7	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by IMA spa	Evaluation of the overall environmental sustainability of products and processes in the automatic machine industry
8	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by ENI SPA	Road paving without fossil resources - the future of bitumen
9	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by ENI SPA	Identification of methods, procedures, experimental equipment to validate or calibrate thermodynamic models for mixtures containing oxygenated compounds of non-fossil origin
10	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP)	Innovative Porous Materials and Devices for blood filtration

		Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by GVS SPA	
11	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by Cooperativa Edile Appennino SC	Study of multi-material bituminous surface applications, in multilayer or mixture, for thin and ultra-thin functional layers
12	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by SACMI IMOLA	Development of analytical procedures for the characterization of the surface properties of innovative materials for packaging made by enhancing renewable resources
13	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by Rothoblaas	Multi-function connection systems for safe, resilient and sustainable timber buildings
14	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by SADEPAN	Studies for the optimization of circular economy applied to the production of wood based panels
15	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by KERAKOLL	State of the art on the use of 3D printing technology in the construction sector, characterization of Kerakoll products for these purposes and development of new dedicated products
16	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by KERAKOLL	Application of natural fibers as an innovative material for FRCM structural strengthening of masonry
17	PhD Scholarship Ex M.D. 352/2022	Funded by the EU - NextGenerationEU with funds made available by the National Recovery and Resilience Plan (NRRP) Mission 4, Component 2, Investment 3.3 (MD 352/2022) and by KERAKOLL	Innovation, sustainability and durability in ceramic tiles installation. Use of recycled aggregates and alternative raw materials for cement based adhesives and durability tests for large format ceramic tiles installation
18	PhD Scholarship	Funded by ENEA - Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile	Scenario analysis and sustainability assessment for the decommissioning of energy plants exploiting renewable sources
19	PhD Scholarship	Funded by ENEA - Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile	Application of principles of circular economy, sustainable resource management, and ecological transition in the blue economy sector

Applicants awarded with Ex M.D. 351/2022 or Ex M.D. 352/2022 PhD scholarships shall have specific obligations (i.e. mandatory research periods abroad and/or in a firm) during their PhD programme. For detailed information, refer to the Call for Applications, articles 1.2 and 1.3, and to the text of the law.

For any other eventual PhD positions, a 6-month research period abroad is mandatory.

Admission Exams

The admission exams detailed schedule shall be published **starting from July 12th, 2022:**

- on the [University website](#), selecting the relevant PhD Programme > “More information”, at the bottom of the page in the section “Notices”;
- on [Studenti Online](#) (select “summary of the requests in progress” > “see detail” and open the .pdf file at the bottom of the page). **No personal written communication will be sent to applicants.**

Required and Supporting Documents to be attached to the application

All the documents listed below **shall be drawn up in English or in Italian**. In case of documents originally issued in any other language (e.g. identity document, qualifications), an official translation is required.

Only qualifications obtained **during the last 5 calendar years** shall be taken into consideration, except for the University Degree. The Admission Board will assess the relevance of the supporting documents to the PhD Programme.

REQUIRED DOCUMENTS	
Identity document	Valid identity document with photo (i.e. identity card, passport)
Curriculum Vitae	No specific CV format is required. Applicants are required to the CV Summary, as first page of the CV (see form at the bottom of the present document).
Degrees	Documents attesting the awarding of the first and second cycle degrees, the exams taken and the marks obtained (see Art. 3 of the Call for Applications)
Research proposal	<p>Multi-annual research proposal, with special emphasis on the activities to be completed during the first-year course. The proposal must meet the following requirements:</p> <ul style="list-style-type: none"> - it must mention on the cover page the Curriculum (1,2,3 or 4) the applicant is interested to and the proposal is about; - it cannot exceed 20,000 characters, including spaces and formula possibly used. This figure does not include: the title of proposal, the outline, references and images (such as graphs, diagrams, tables, etc. - if present); - it must include: the state of the art; description of the proposal; expected results; outline of the proposed findings assessment criteria; references. <p>The research proposal that successful applicants shall carry out during their PhD career may possibly differ from the one proposed at the application stage. This shall be defined together with the supervisor and approved by the Academic Board.</p>
SUPPORTING DOCUMENTS	
Thesis abstract	Abstract of the second cycle degree thesis . Graduands applicants may submit the draft of the thesis. Abstracts cannot exceed 5,000 characters, including spaces and formula possibly used. The above figure does not include: the title of the thesis, the outline, references, and images such as graphs, diagrams, tables etc.
Personal Statement	The statement shall include the reasons prompting the applicant to attend the PhD Programme and those relevant experiences and research interests , that make the applicant suitable for the specific PhD Programme (3000 characters maximum, including spaces).
Publications	Lists of publications (i.e. monographs, articles on scientific journals), minor publications (conference papers, etc.), abstracts and posters presented during national and international conferences, etc.
Other documents	<ul style="list-style-type: none"> - Postgraduate vocational training programmes relevant to the PhD Programme main research topics - Teaching activities carried out at academic level - Research activity of any kind - whether basic, applied, translational, etc. - carried out in any capacity, including when covered by research grants, and as a staff member of research projects - Work activity - Curricular or non-curricular professional internships - Documents attesting the applicant’s foreign languages proficiency - Study periods completed by applicants outside their countries of origin (e.g. Erasmus programme or other similar mobility programmes) - Other qualifications attesting the suitability of the applicants (scholarships, prizes, etc.)

Evaluation criteria*

Scores will be expressed in points out of 100, as follows.

1. Qualifications and research proposal evaluation

Minimum score for admission to the oral examination: 30 points, Maximum score: 50 points

Qualifications evaluation	University degree final mark and Weighted Average Mark (WAM). Graduands shall be evaluated according to the Weighted Average Mark (WAM)	20 points max
	Publications	3 points max
	Other evaluable documents	2 points max
Research proposal evaluation	Scientific value and ground-breaking nature of the proposal	12 points max
	Structure of the proposal	8 points max
	Proposal feasibility	5 points max

2. Oral examination

Minimum score for eligibility: 30 points, Maximum score 50 points

English language proficiency	5 points max
Research proposal presentation	25 points max
General knowledge of issues encompassed by the PhD Programme	20 points max

Oral examination aims to assess the suitability of the applicant for scientific research as well as the general knowledge of issues encompassed by the PhD Programme (see the list of [research topics](#) at the bottom of the present document).

During the oral examination, the applicant's English language proficiency shall be assessed.

The oral examination is carried out in Italian or in English.

* Possible further evaluation criteria will be available on the [University website](#), selecting the relevant PhD Programme > "More information".

Research Topics

Curriculum 1: Engineering of infrastructure, resources and territory

- Hydraulics and Hydraulic works
- Sanitary engineering
- Roads and Transport Systems
- Topography and Cartography
- Geoengineering and Georesources
- Applied Geology

Curriculum 2: Structural and Geotechnical Engineering

- Continuum Mechanics
- Structures
- Geotechnics

Curriculum 3: Chemical and process engineering

- Principles of Chemical Engineering
- Chemical Plants
- Fundamental of Chemical Process Development
- Industrial and Technological Chemistry

Curriculum 4: Materials engineering and industrial biotechnology

- Fundamental Chemistry of Technologies
- Materials Science and Technology
- Industrial, Food and Environmental Biotechnologies

CV SUMMARY OF THE CANDIDATE (to be attached to the CV)

Surname _____
First name _____
Place and date of birth _____

Curriculum of interest for the Doctorate in Civil, Chemical, Environmental and Materials Engineering (select one):

- 1. Engineering of infrastructure, resources and territory
- 2. Structural and geotechnical engineering
- 3. Chemical and process engineering
- 4. Materials engineering and industrial biotechnology

TRAINING

Bachelor's degree (if more than one, repeat this section as needed)

Degree in: _____
Year of graduation: _____
University: _____
Country: _____
Formal duration of the course: _____ (years or fractions)

Weighted average of the marks obtained in the exams (GPA): _____
Minimum mark for sufficiency _____
Maximum possible mark _____
Average mark achieved by students¹: _____; reference set considered (e.g. degree course / subject area / university): _____

If the course provides for an overall final grade / verbal judgment (exams + final test) other than the GPA of the exams and the final test only:

Evaluation / mark achieved: _____
Grading scale adopted / minimum and maximum achievable mark: _____

Master's degree or single-cycle master's degree (if more than one, repeat this section as needed) Master in:

Year of graduation: _____
University: _____
Country: _____
Formal duration of the course: _____ (years or fractions)

Weighted average of the marks obtained in the exams (GPA): _____
Minimum mark for sufficiency _____
Maximum possible rating _____
Average mark achieved by students¹: _____; reference set (e.g. degree course / subject area / university): _____

If the course provides for an overall final grade / verbal judgment (exams + final test) other than the GPA of the exams and the final test only:

Evaluation / mark achieved: _____
Grading scale adopted / minimum and maximum achievable mark: _____

NOTES

¹ If the information is available. The average mark or the mark of 50% percentile (median) can be reported [specify which one].