

Master Programme in Sustainable Building Engineering

LM 24 Class – Building Systems Engineering

Studies Program 2020-2021

Specific learning targets

The Master's Programme (second cycle – 120 ECTS) *Sustainable Building Engineering*, given in Rieti, is aimed to educate a Master Engineer, aware of the goals of the Agenda for Sustainable Development released by United Nations, with a specific relationship to building engineering.

These goals can be summarized as in the followings.

- To develop quality, reliable, sustainable and resilient buildings and environment, including regional and transborder infrastructures, to support economic development and human wellbeing, with a focus on affordable and equitable access for all.
- To upgrade buildings and environment and retrofit industries to make them sustainable, with increased resource use efficiency and greater adoption of clean and environmentally sound.
- To facilitate sustainable and resilient city and territory development through enhanced financial, technological and technical support to (e.g.) developed countries, developing countries and small island developing States. To ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums. To provide access to safe, affordable and sustainable transport. To enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.
- To strengthen efforts to protect and safeguard the world's cultural and natural heritage.
- To significantly reduce the number of deaths and the number of people affected and to significantly decrease the direct economic losses relative to global gross domestic product caused by disasters, including water related disasters, water resources lack and their protection, and seismic related ones, with a focus on protecting the poor people in vulnerable situations, due to, also, groundwater resources supply scarcity.
- To reduce the adverse pro capita environmental impact of cities, also by paying special attention to air quality and "municipal and other" water, wastewater and solid wastes management.
- To contribute to the education of building and environment designers, able to operate in the constitution of a sustainable and resilient city and territory.
- To significantly support the increasing number of cities and human settlements which adopt and implement integrated policies and plans towards inclusion, wellbeing, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels.

With the aim of reaching these targets, the Master's Programme in Sustainable Building Engineering will provide a multidisciplinary approach. E.g. subjects like Remote sensing, Geographic Information System (GIS) and Digital Modeling for Architecture will be included, as the right representation of territories and buildings is the first step for designing new building and restoring the existing ones.

Building design for architectural renovation and regeneration, Structural Dynamics, Seismic Design, Foundation Design, Building Health, Bioclimatic Design, will be addressed to improve the skills of the future building sustainable engineer.

The "building object" is the component of a more wide network of environment and infrastructure, then Hydraulics, Hydraulic Infrastructures, Wastewater Treatment Plants Design, Solid Waste and Groundwater Management, Engineering Geophysics, Sustainable Techniques for Road Construction will be all given to make the student aware and skilled about the educational targets of the Master's Programme in Sustainable Building Engineering.

Admission requirements (DM 270/04, Article 6, paragraphs 1 and 2)

Curricula requirements

To access the Sustainable Building Engineering Master's Programme, headquartered in Rieti, students should be in possession of a bachelor's degree or a three-year university degree, i.e. foreign qualifications, recognized as equivalent.

Certified B2 level in English skills is mandatory as spoken and written.

Before registering, the possession of curricular requirements and the appropriateness of personal preparation will be verified according to the following arrangements.

Personal preparation may be adjusted through the overcoming of tests designated for the purpose by the Faculty Council, without this step resulting in the acquisition of credits valid for Master's Programme achievement.

The compliance with the curricular requirements must be fully completed before the acquisition of any training credit included in the study plan defined upon registration.

The assignment of credits is planned to follow the recognition of knowledge and professional skills individually certified in accordance with current legislation, as well as of knowledge and expertise gained in post-secondary level training activities whose designing and realization the university has contributed, as long as they are not already recognized for the purpose of assignments of credits within the origin's Degree Course.

The assignment of credits is also expected for knowledge acquired after the overcoming of tests taken in university degree courses, in case not resulting in the acquisition of credits used for the degree achievement.

Total number of academic credits recognized is set at 12.

Admission to the degree course requires the achievement of at least 120 academic credits in the degree course or university degree or other course of study officially recognised in scientific discipline areas, listed in the Ban.

Description of the training course

The Master's Programme curriculum addresses the graduates equipped with a solid preparation in Maths, Chemistry and Physics basic disciplines, as well as background knowledge in building and environmental engineering. The curriculum provides from the first year a level of knowledge and operating methods typical of modern engineering techniques, on which to base the needed skills and specific training in the sustainable building fields. During the second year, students will further deepen the disciplines covered through the learning of professionalizing fields, and will complete their study programme with an individual work of Master's Programme thesis on a complex interdisciplinary topic.

To complete the study programme, each student has available supplementary disciplines, related to the mandatory ones, which enable him to improve knowledge useful for professional training and necessary for designing and coordinating operational actions in sustainable building engineering fields.

Final Test characteristics

(DM 270/04, art 11, comma 3-d)

The final test is made of the degree thesis discussion and involves the acquisition of 17 academic credits.

This thesis, of interdisciplinary nature and including an original content, represents a fundamental step to verify the acquisition of knowledge by students and their ability to deepen those skills, apply autonomously and in an original way to issues and specific aspects of modification of the territory for settlement purpose, protection and enhancement of its environmental aspects.

Employment opportunities expected for graduates

(Classes Decree, Art. 3, comma 7)

Sustainable Building Engineering Master's Programme addresses specific demands of the labour market, with high levels of educational quality appropriate to current socio-economic development trend prospects.

Graduates in Sustainable Building Engineering, by applying their problem solving skills, can carry out duties of high responsibility within institutions and public and private companies, engineering companies, industries in the building and environmental sector, construction companies and land management services, as well as in the research field, in private practice and in consultancy work.

Manifesto

The Master's Programme allows to deepen topics concerning construction engineering, declined in accordance with the needs of environmental protection and sustainability, which correspond to operational areas traditionally characterizing construction and civil-environmental Engineering. The aim is to provide graduates with a deeper awareness of the close interdependence and complexity of territory modification actions and of the particular emphasize that the environmental compatibility points to the design and set-up of construction works.

The part of overall time commitment available to students for independent study or other individual training activities is fixed at 60% at least (15 hours for each academic credit).

I Year (45 ECTS - MANDATORIES)

Subject	SSD	ECTS	Exam	Semester	Year	Activity
Digital modelling for architecture	ICAR/17	9	E	1	1	B
Remote sensing and GIS	ICAR/06	6+3	E	1	1	B
Building design and H-BIM for architectural renovation	ICAR/10	6+3	E	2	1	B
Foundation and earth retaining structures	ICAR/07	9	E	2	1	B
Water and solid waste treatment plants	ICAR/03	9	E	2	1	B

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II Year (18 ECTS - MANDATORIES)

Subject	SSD	ECTS	Exam	Semester	Year	Activity
Structural dynamics	ICAR/08	9	E	3	2	B
Seismic design	ICAR/09	9	E	4	2	B

9 ECTS FROM THE FOLLOWING OPTIONAL SUBJECTS

Subject	SSD	ECTS	Exam	Semester	Year	Activity
Hydraulic infrastructures	ICAR/02	9	E	2	1	C
Urban health	MED/42 ICAR/05	6+3	E	2	1	C
Architectural engineering for sustainable buildings and environment	ICAR/10	9	E	3	2	C
Bioclimatic design	INGIND/11	9	E	3	2	C
Groundwater management	GEO/05	9	E	4	2	C

12 ECTS FROM THE FOLLOWING OPTIONAL SUBJECTS

Subject	SSD	ECTS	Exam	Semester	Year	Activity
Construction site organization	ICAR/11	6	E	3	2	C
Sustainable techniques for road construction	ICAR/04	6	E	3	2	C
Project evaluation	ICAR/22	6	E	3	2	C
Urban design	ICAR/20	6	E	3	2	C
Project financing	ING-IND/35	6	E	3	2	C
Advanced design for sustainable building components	ICAR/10	6	E	4	2	C
Advanced processes and technologies for water sustainability	ICAR/03	6	E	4	2	C
Architectural Design	ICAR/14	6	E	4	2	
Engineering geophysics	GEO/11	6	E	4	2	C
Environmental Hydraulics	ICAR/01	6	E	4	2	C
Sustainable materials technologies	ING-IND/22	6	E	4	2	

36 ECTS FROM OTHER ACTIVITIES

Activity	ECTS	Exam	Semester	Year
Chosen by the student	15	E	1/2	1/2
Final test	18			
Other educational activities to facilitate entry to the labour market	3	I	1/2	1/2

Teaching methods adopted, even at distance, and assessment procedures

Each teaching class will be arranged into lectures, practical exercises, workshops, group work and any other activity that the professor considers useful.

For each teaching class, learning level evaluation will take place through an exam (E) consisting of spoken or written tests in accordance with the arrangements set out by the professor and made public along with the class programme (or published on the website www.uniroma1.it, Faculty of Civil and Industrial Engineering).

Some activities will be not required for the aim of the exam, but will be considered necessary to the professor for the release of the judgement of qualification (V). Procedures to follow will be by the professor also in this case.

Attendance for part-time students

Students about to register and students of the course committed also in other activities, may require choosing the part-time institution and achieve a lower number of annual academic credits in place of the 60 credits expected as a rule.

Conditions related to the part-time institution are set out within the University Rules. For rights and duties of part-time students, it can be referred to the established general requirements.

The Programme Course will appoint a tutor to support part-time students in the training course.

Rules on transition to the next years and pre-requisites

In order to enroll to the second year of the Master's Programme, the student, must have attained at least 21 credits.

Students enrolled to previous ordinances

Students from the Second Level Degree in Civil Construction Engineering 4s class (D.M. 509/99) held in Rieti, and from the Second Level Degrees (D.M. 509/99) 8s class, of Sapienza University of Rome, can, on request, obtain the transition to the Sustainable Building Engineering Master's Programme, LM24 class (D.M. 270/04), provided that the Degree Council of the training activities recognizes the academic credits previously attained.

Assessment of study periods abroad

Courses attended in European or foreign Universities, which have existing agreements, projects and/or conventions with the Civil and Industrial Engineering Faculty, can be approved in accordance with the arrangements laid down.

Students can carry out a period of study abroad within the project LLP Erasmus, subject to the approval by the Degree Council.

In accordance with the University Learning Regulations, in case of studies, exams and academic titles gained abroad the Degree Course considers from time to time the study programme for credits awarding in the corresponding scientific areas.

General info

Information regarding the Master's Programme are provided in the Sapienza University of Rome educational offer website, and can be found in the MIUR official website.

Detailed information regarding study programmes and teaching materials are available on the website www.uniroma1.it, Faculty of Civil and Industrial Engineering or sbe@uniroma1.it

E-mail address of the Master's Programme is: segreteria@uniroma1.it

In addition, as regards tutoring services, the Master's Programme makes use of tutoring services offered by the Faculty. The Teaching Staff of the course carries out tutoring activities to support students. Schedule times for meetings with the students can be found for each teacher on the Degree Course website. Students interested in internships, must contact the university tutor and the company tutor. In addition to the regular academic tutoring service, the Degree Course offers additional tutors especially for core and design disciplines.

Quality assessment

The Degree Course, in cooperation with the Faculty, carries out the detection of student's opinion for each teaching course. The survey system is integrated within a quality path whose responsibility is entrusted to a self-evaluation group, teachers, students and the study course staff. The results of surveys and self-evaluation group analysis are used to perform improvement actions of the training activities.

The Coordinator of the Master's Programme
Prof. Giuseppe Sappa