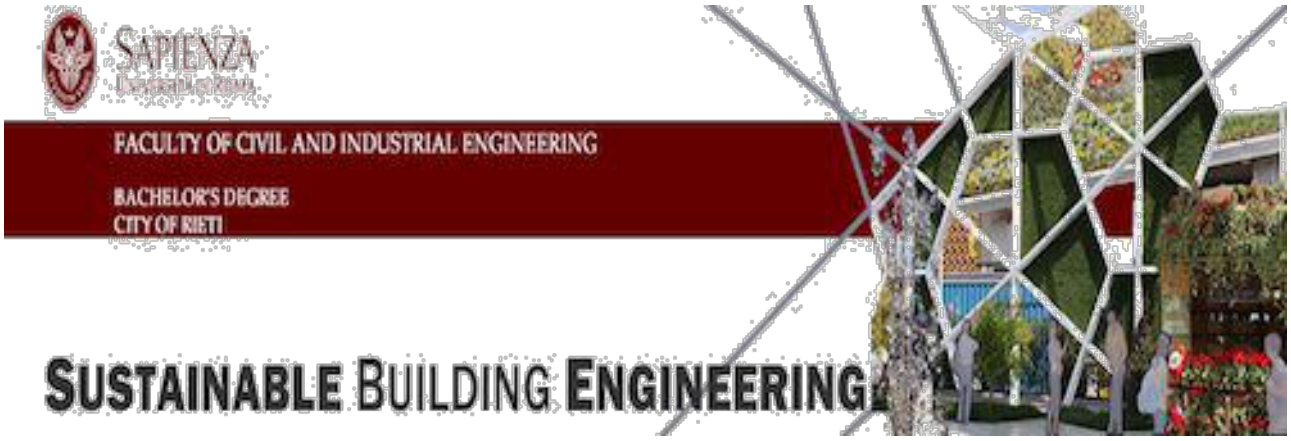

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Sustainable Building Engineering

SUSTAINABLE BUILDING ENGINEERING

Academic year 2019/2020

EDUCATIONAL OBJECTIVES

This degree is especially conceived to train professionals capable of taking on different projects both at a local and international scale. At the design phase, a sustainable building engineer will be ready to develop and control sustainable design strategies in architecture and urban planning. During the construction process, the Sustainable Development Engineer will be able to use sustainable and recycled materials to minimize waste flows and to prevent eventual damage to the urban surroundings or to the natural environment. As a facility manager, he/she knows how to reduce the energy demand, how to alternatively use other natural resources, and propose fitting solutions using a sustainable approach.

This program also provides students with the scientific knowledge needed to obtain an appropriate technical and operational education in the field of Architectural and Environmental Engineering, whose major goal is the organization, protection and modification of the built environment and territory, with least impact on the environment.

Another target of the course is the acquisition of analytical skills to recognise, understand, plan and design in environmental conditions.

By teaching the multiple activities of management, design, development, production at different operational levels, that are at the core of the building industry, this course provides students with the basic knowledge needed to transform a territory in all its physical, economic, social and morphological aspects, from a sustainable point of view.

The curriculum initially covers basic subjects, such as physics, mathematics, engineering geology, and building representation. It then proceeds to more application and intervention specific subjects in multidisciplinary fields of sustainable building engineering such as urban planning, architectural technology, hydraulics, hydrology, environmental engineering, planning, structural mechanics, structural techniques, geotechnics and road construction, taught stressing the specific aspects of sustainable development.

This will be accompanied by the teaching of the principles of environmental health and of materials technology for sustainable construction. Hence, the Sustainable Building Engineer will be able to tackle the many complex issues of building engineering, from design to work management, with a focus on environmental protection and environmental risks prevention.

Among its principal objectives the course in Sustainable Development aims to prepare the student, on completion of the degree, for admittance to the Master's Degree in Environment and Sustainable Building Engineering, which aims to provide a more complete and thorough preparation in the skills required to work in the sphere of intervention in the built environment and upon the territory, both to restore, preserve and to protect it.

COMMUNICATION SKILLS

Graduate students must be able to formulate, in the relevant disciplinary fields and at different levels of application, the study of a given problem and describe clearly the analysis carried out, the information acquired, the elaborations made, the synthesis reached and the solutions foreseen, both

in terms of methodologies and operative parameters used, and in terms of the related technical aspects. They must also be able to do so when planning possible solutions, arrived at on the basis of their competences.

When practising their profession, graduates must know how to interact effectively with various operators such as specialists in the sector and external operators connected to the sector, who intervene on the territory.

To reach this goal, the educational program offers various opportunities, both during normal educational activities and during other activities aimed at developing the students' communication skills such as discussions, exhibitions, workshops, etc. both individually and in groups, providing students with opportunities to meet external representatives of the job market, local authorities, and to participate in conferences, lectures, guided tours, etc.

The final examination, in addition to those held during the entire course of studies to do with the various activities that are carried out during the Degree, is the dissertation, an essential opportunity to display the communication skills learnt in relation to the educational themes addressed.

The educational path aims also at developing the competence necessary to be capable of undertaking basic communication through the English language.

INDEPENDENT JUDGEMENT

The core and professional courses included in the study plan are mainly aimed at developing the students' practical and operative skills through educational paths that involve individual and group exercises and activities.

The goal is to provide students with all the intellectual instruments necessary to create their technical proposal independently and autonomously, without external influence.

The academic programs enable students, through discussions and a problem-solving approach in relation to actual cases, to develop their judgment and selection skills, to process and interpret the data, to identify and develop technical solutions and operational tools that align with the needs of undertaking technical interventions taking into account environmental sustainability.

Thus, carrying out practical activities which are occasion for actual project elaboration, enables them to acquire the capacity to operate independently.

To ensure that all the educational goals have been achieved, various tests will be held during the course of studies.

LEARNING SKILLS

Thanks to an educational course that develops a broad and strong general knowledge of many scientific subjects, and a thorough methodological approach to the development of practical interdisciplinary skills, the student should possess the means to continue to broaden their technical knowledge independently, when dealing with topics which match their expertise, and therefore be eligible for the Master's Degree. The learning abilities which are guaranteed by the knowledge acquired through the core subjects, in the operative methodologies and critical in-depth analysis, guarantee that graduates will continue to learn systematically throughout the whole course of their professional career.

CARREER OPPORTUNITIES

The purpose of the Degree in Sustainable Building Engineering is to train intermediary professional figures, capable of carrying out activities in the different areas of the building sector, starting from the organization, protection and modification of the built environment and territory at different levels, whilst respecting the environmental constraints and ensuring minimum environmental impact.

The objective of this course is also the acquisition of analytical skills for recognizing, understanding, planning and designing in complex environmental conditions.

The graduate will then be able to apply the technological knowledge and skills gained in the world of public and private institutions and bodies, engineering firms, building and environmental industries, construction companies, as well as in a freelance capacity and in consulting services. The Degree Course also prepares students for admittance to various Master's Degrees and, in particular, the Master's Degree in Environmental and Sustainable Building Engineering, which provides more specific and in-depth knowledge to those who wish to expand their expertise in the sustainable building process.

COMPETENCES

The skills of the graduate involve:

Survey on morphological and physical characteristics of the environment, urbanised areas and buildings.
Identification, prefiguration and evaluation of technical interventions upon the territory, produced by modifications for settlement purposes.
Planning and construction processes in their various components: management, financial assessment, technical-administrative supervision of technical interventions, including safety measures; Supervision of industrial production processes for building components and systems, as well as the maintenance of building structures, their integration and provision of services, and related safety.

OUTCOMES

The Degree Course also prepares students for admittance to various Master's Degrees and, in particular, the Master's Degree in Environmental and Sustainable Building Engineering, which provides more specific and in-depth knowledge for technical interventions on the territory, both to change and to protect it.

First year

First semester

Name	Att. Form.	SSD	CFU	huors	Tip. Att.	Language
10589200 - MATERIALS TECHNOLOGY FOR SUSTAINABLE CONSTRUCTION WITH APPLIED CHEMISTRY ELEMENTS	B	ING-IND/22	9	90	AP	ENG
10589707 - ANALYSIS I AND II			0	0		
ANALYSIS II	A	MAT/05	6	60	AP	ITA
ANALYSIS I	A	MAT/05	6	60		
10592807 - DESCRIPTIVE GEOMETRY AND ARCHITECTURE DRAWING WITH ELEMENTS OF ARCHITECTURE HISTORY			0	0		
ELEMENTS OF ARCHITECTURE HISTORY	A	ICAR/18	6	60	AP	ENG
DESCRIPTIVE GEOMETRY AND ARCHITECTURE DRAWING	A	ICAR/17	9	90		

Second semester

Name	Att. Form.	SSD	CFU	huors	Tip. Att.	Language
10589431 - ENVIRONMENT AND HEALTH	C	MED/42	9	90	AP	ENG
10589707 - ANALYSIS I AND II			0	0		
ANALYSIS II	A	MAT/05	6	60	AP	ITA
ANALYSIS I	A	MAT/05	6	60		
10589188 - PHYSICS	A	FIS/01	9	90	AP	ENG
10589211 - GEOMETRY	A	MAT/03	6	60	AP	ENG
AAF1871 - FOREIGN LANGUAGE	E		3	30	I	ENG

Second year

First semester

Name	Att. Form.	SSD	CFU	huors	Tip. Att.	Language
10589233 - GEOMATICS	B	ICAR/06	6	60	AP	ENG
10589238 - HYDRAULICS	B	ICAR/01	9	90	AP	ENG
10592816 - BUILDING DESIGN FOR SUSTAINABLE ARCHITECTURE-ARCHITECTURAL DESIGN			0	0		
ARCHITECTURAL DESIGN	B	ICAR/14	6	60	AP	ENG
BUILDING DESIGN FOR SUSTAINABLE ARCHITECTURE	B	ICAR/10	9	90		

Second semester

Name	Att. Form.	SSD	CFU	huors	Tip. Att.	Language
10592816 - BUILDING DESIGN FOR SUSTAINABLE ARCHITECTURE-ARCHITECTURAL DESIGN ARCHITECTURAL DESIGN BUILDING DESIGN FOR SUSTAINABLE ARCHITECTURE	 B B	 ICAR/14 ICAR/10	0 6 9	0 60 90	AP	ENG
10589296 - STRUCTURAL MECHANICS	B	ICAR/08	9	90	AP	ENG
10589219 - ENGINEERING GEOLOGY FOR SUSTAINABLE BUILDING	A	GEO/05	9	90	AP	ENG
10589273 - ENVIRONMENTAL ENGINEERING PHYSICS	B	ING-IND/11	6	60	AP	ENG
AAF1960 - MORE FOREIGN LANGUAGE KNOWLEDGE	F		3	30	I	ENG
Gruppo opzionale: 6 cfu of your choice in C	C					

Third year

First semester

Name	Att. Form.	SSD	CFU	huors	Tip. Att.	Language
10589178 - PRINCIPLES OF ENVIRONMENTAL ENGINEERING	B	ICAR/03	9	90	AP	ENG
10589197 - SUSTAINABLE COMMUNITY PLANNING	B	ICAR/20	6	60	AP	ENG
10589444 - STRUCTURAL DESIGN	B	ICAR/09	6	60	AP	ENG
Gruppo opzionale: 6 cfu of your choice in C	C					

Second semester

Name	Att. Form.	SSD	CFU	huors	Tip. Att.	Language
10589479 - HYDROLOGY	C	ICAR/02	9	90	AP	ENG
10589291 - GEOTECHNICAL ENGINEERING	B	ICAR/07	9	90	AP	ENG
Gruppo opzionale: 6 cfu of your choice in C	C					
AAF1893 - CHOSEN BY THE STUDENT	D		12	120	I	ENG

AAF1959 - FINAL TEST	E	3	30	I	ENG

Name	Att. Form.	SSD	CFU	Huors	Tip. Att.	Language
Gruppo opzionale: 6 cfu of your choice in C						
10589502 - BIOCLIMATIC BUILDING DESIGN *(primo semestre)*	C	ING-IND/11	6	60	AP	ENG
10589464 - PROJECT EVALUATION *(secondo semestre)*	C	ICAR/22	6	60	AP	ENG
10589498 - COMPARATIVE INTERNATIONAL LEGISLATION FOR PUBLIC WORKS *(secondo semestre)*	C	IUS/09	6	60	AP	ENG
10589420 - ENGINEERING GEOPHYSICS *(secondo semestre)*	C	GEO/11	6	60	AP	ENG
10589468 - BUILDING COMPONENTS DESIGN *(secondo semestre)*	C	ICAR/10	6	60	AP	ENG
10589491 - SUSTAINABLE TECHNIQUES FOR ROAD CONSTRUCTION *(secondo semestre)*	C	ICAR/04	6	60	AP	ENG
10592797 - CONSTRUCTION SITE MANAGEMENT *(secondo semestre)*	C	ICAR/11	6	60	AP	ENG
10592796 - ELABORATION OF DATA *(secondo semestre)*	C	ING-INF/05	6	60	AP	ENG
10592795 - GEOHAZARDS *(primo semestre)*	C	GEO/05	6	60	AP	ENG