UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II SCUOLA
POLITECNICA E DELLE SCIENZE DI BASE

DIPARTIMENTO DI ARCHITETTURA

A SHORT GUIDE FOR INCOMING STUDENTS BACHELOR

DEGREE

Urbanistica Sostenibile (UrbS) / *Sustainable Urbanism*

Classe L-21 - Lauree in scienze della pianificazione territoriale, urbanistica, paesaggistica e ambientale

*If you need help, please remember that your first Spokesperson is your Erasmus Exchange representative.

Year/ semester	Type Activities	Name	Discipline code	Disciplinary area	Credits	Exams
1/I	monodisciplinary	Mathematics and Statistics	STAT-04/A	Mathematics, physics, computer science and statistics disciplines	9	1
1/I	monodisciplinary	History of the City and Landscape	CEAR-11/A	Architectural disciplines	8	1
1/I	monodisciplinary	Representing the Territory	CEAR-10/A	Representation disciplines	6	1
1/I	monodisciplinary	Ennglish (B1)	other activities art.10, c.5, lett.c		4	-
1/II	monodisciplinary	Information Technology	INFO-01/A	Mathematics, physics, computer science and statistics disciplines	5	1
Lab n.1 INTERPRETING THE TERRITORY						
1/II	Lab 1	Territorial Surveys	CEAR-12/B	Urban planning disciplines	10 (6+4)	1
		Interpretation of urban fabric	CEAR-09/A	Architectural disciplines		
Integrated Course - THE ECOLOGICAL STRUCTURE OF SETTLEMENTS						
1/II	Integrated Studio	Ecology	BIOS-05/A	Agricultural, ecological, geographical and geological disciplines	10 (5+5)	1
		Sustainability of Environmental Systems	CEAR-08/C	Architectural disciplines		
1/II	monodisciplinary	Communication and media	Further activities art.10, c.5, lett. d		4	--
1		FREE CHOICE ACTIVITIES	other activities art.10, c.5, lett.a		4	--
					60	**6**
Integrated course TERRITORIAL NETWORKS AND SUSTAINABILITY						
2/II	Integrated course	New Territorial Economies	CEAR-03/C	Disciplines of land use and engineering	10 (5+5)	**1**
		Enterprises, Innovation, and Territory	14/GSPS-08/B	Disciplines of Law, economics and sociology		
2/I	monodisciplinary	Urban Planning, Environment, and Landscape	CEAR-12/B	Urban planning disciplines	6	**1**
2/I	monodisciplinary	Graphical and Cartographic data processing	CEAR-12/B	Urban planning disciplines	4	**1**
2/I	monodisciplinary	Geographic information System	CEAR - 12/A	Urban planning disciplines	6	**1**
Lab n.2 PLANNING FOR SUSTAINABILITY						
2/II	Lab. 2	Planning tools for territorial transformation	CEAR-12/B	Urban planning disciplines	14 (6+4+4)	**1**
		Evaluation for decision-making processes	CEAR-03/C	Disciplines of land use and engineering		
		Architecture of the City and Territory	CEAR-09/A	Architectural disciplines		
Integrated course URBAN AND REGIONAL PLANNING						
2/I	Integrated course	Urban planning and environmental legislation	GIUR-06/A	Disciplines of Law, economics and sociology	12 (6+6)	**1**
		Urban and Regional Planning Techniques	CEAR-12/A	Urban planning disciplines		

Year/ semester	Type Activities	Name	Discipline code	Disciplinary area	Credits	Exams
2		FREE CHOICE ACTIVITIES	other activities art.10, c.5, lett.a		8	1
					60	**7**
Lab n.3.1 SUSTAINABLE DESIGN						
3/I	Laboratory	Environmental Design	CEAR-08/C	Architectural disciplines	10 (6+4)	1
		Energy systems for territory and community	IIND-07/B	Physico-technical and plant engineering disciplines for architecture		
Integrated course DIGITAL CITIES AND COMMUNITIES						
3/I	Integrated course	Digital Society and Territorial Processes	GSPS-08/B	Disciplines of Law, economics and sociology	10 (5+5)	1
		Intelligent systems for data management	INFO-01/A	Mathematics, physics, computer science and statistics disciplines		
3/I	monodisciplinary	Rural Land Analysis	AGRI-04/C	Agricultural, ecological, geographical and geological disciplines	5	1
Lab n.3.2 PLANNING FOR THE URBAN METABOLISM						
3/II	Laboratory	Circular Urbanism	CEAR-12/B	Urban planning disciplines	15 (6+6+3)	1
		Technological Design of Life Cycles	CEAR-08/C	Architectural disciplines		
		Multidimensional Evaluations	CEAR-03/C	Disciplines of land use and engineering		
3/II	monodisciplinary	Urban and Territorial Policies	CEAR-12/A	Urban planning disciplines	6	1
3		FURTHER ACTIVITIES	other activities art.10, c.5, lett.d		3	-
3		Internship	other activities art.10, c.5, lett.e		6	-
3		Final test	other activities art.10, c.5, lett. c		5	-
					60	**5**
					180	**18**

Courses and studios

FIRST YEAR

Course: MATHEMATICS AND STATISTICS	**Teaching Language:** Italian
SSD (Subject Areas): STAT-04/A	**CREDITS:** 9
Course year: 1	**Type of Educational Activity:** Basic (A)
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The SSD includes both the identification and the development of mathematical methods and tools, including calculation and data processing techniques, useful in the construction and analysis of models and problems relating to business management; to the economic and social sciences; to individual, strategic and collective choices; market analysis; to risk management.	
Objectives: The course aims to provide the mathematical and statistical foundations necessary for the study of the technical-scientific disciplines, for a correct analysis and processing of data provided by different sources and for the management of decision-making problems.	
Propaedeuticities: No one **Is a propaedeuticity for:** No one	
Types of examinations and other tests: Written and oral.	

Course: HISTORY OF THE CITY AND LANDSCAPE	**Teaching Language:** Italian
SSD (Subject Areas): CEAR–11/A (ex ICAR/18)	**CREDITS:** 8
Course year: 1	**Type of Educational Activity:** Characterizing (B)
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The scientific-disciplinary contents are focused on the knowledge and interpretation of territorial transformations, the environment and landscape, the city and built heritage, architectural works and their authors and patrons, the history of architectural theories, construction techniques and building sites, the history of design, analyzed in relation to specific political, economic, social, and cultural contexts.	
Objectives: The course aims to provide the basic knowledge necessary to recognize the values of cultural, architectural, urban, and landscape heritage, in both its tangible and intangible aspects, within the constant re-evaluation of meanings that the present attributes to the past, enhancing students' knowledge and critical interest in these topics. Additionally, it seeks to develop students' interpretative abilities regarding sources, using both traditional and innovative research methodologies, including the field of digital humanities. Specifically, through the use of sources, the course aims to outline the processes of formation and transformation of the built environment, with a particular focus on industrialized Western countries and the contemporary era.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral exam and discussion of the paper developed during the lectures, seminars, and site visits.	

Course: REPRESENTING THE TERRITORY	**Teaching Language:** Italian	
SSD (Subject Areas): CEAR-10/A (ex ICAR/17)		**CREDITS:** 6
Course year: 1	**Type of Educational Activity:** Basic (A)	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The scientific-disciplinary content concerns the representation of the territory and its physical-formal features, but also as a complex system of tangible and intangible relationships. The didactic-educational activities are carried out using all kinds of methods and tools related to representation and reproduction in the fields of architecture, engineering, design, landscape, cultural heritage, archaeology, and creative cultural industries. Drawing and Representation are conceived in their broadest definition as a cognitive tool to interpret the formal structure and for the analysis, communication, use, and dissemination of existing values, both tangible and intangible. Within this framework, Representation also deals with information and communication theories and techniques.		
Objectives: The course provides students with the theoretical principles underlying the various representations of the territory; the knowledge and tools for a critical interpretation of the representation methods historically used in the drafting of territorial plannings and projects; the basic principles of the traditional and computerised techniques used for representing the complex relations that characterise the territory as previously described. In this regard, the representation of the territory is intended not only as a documentation of the existing, but also as a tool to promote the particularities of the territory itself.		
Propaedeuticities: None **Is a propaedeuticity for:** None None		
Types of examinations and other tests: Oral discussion and evaluation of the graphics produced.		

Course: INFORMATION TECHNOLOGY	**Teaching Language:** Italian	
SSD (Subject Areas): INFO-01/A (ex INF/01)		**CREDITS:** 5
Course year: 1	**Type of Educational Activity:** Basic (A)	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The scientific disciplinary contents concern computational systems and processes and automatic information processing and the study of their foundational, methodological, technological, social and didactic aspects. They refer to the scientific and training activities related to the design, implementation, management and use of information systems. The skills concern the conceptual bases and applications of computer science, used in the various disciplines for the resolution of problems through the computational approach.		
Objectives: The aim of the course is to provide knowledge of the basic methods and tools for designing and analyzing data and managing and analyzing large geographic data. Particular emphasis is given to the processes of management, acquisition from heterogeneous institutional sources, reconciliation and normalization of data in a relational database, data querying, acquisition and conversion into a single coordinate system of vector and raster spatial data, the use of thematic classification methods for the creation of thematic maps and the use of geoprocessing operators in spatial analysis processes. At the end of the course, students will have acquired the knowledge and skills necessary for managing and analyzing data organized in relational databases and the processes necessary for designing GIS and developing spatial analysis processes, acquiring the aptitude for problem solving with the advanced aid of GIS as decision support tools.		

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests: W
Oral examination

Course: Lab n.1 INTERPRETING THE TERRITORY Module 1 Territorial Surveys Module 2 Interpretation of urban fabric	**Teaching Language:** Italian
SSD (Subject Areas): Module 1 CEAR-12/B (ex ICAR/21) Module 2 CEAR-09/A (ex ICAR/14)	**CREDITS:** 10 Module 1 6 CFU Module 2 4 CFU
Course year: 1	**Type of Educational Activity:** Modulo 1 Characterising (B) Modulo 2 Characterising (B)

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The scientific-disciplinary contents include:
for the Territorial Investigations module
- the conceptual apparatus, theories, methods, techniques and models for the analysis, evaluation, planning and design of cities, territories, landscapes and the environment, at different scales, through transdisciplinary approaches and the use of new digital technologies.
for the Interpretation of urban fabric module
- methodological aspects concerning design theories; analytical-instrumental aspects relating to the study of the distributional, typological, morphological, spatial and linguistic characteristics of architecture and the city; design aspects, concerning the formal and settlement logic of parts in relation to architecture and places, the urban and natural context, infrastructures and the territory.

Objectives:
The main objective of this lab is to introduce students to the complexity of places and urban problems and let them experiment with ways of assembling and dismantling this complexity. This objective is carried out through a survey of an urban context and of the interacting processes, interpreting its urban fabric characteristics and identifying the appropriate languages and tools to represent the outcomes of the survey.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral exam and project discussion

Course: Integrated course THE ECOLOGICAL STRUCTURE OF SETTLEMENTS Module 1 Ecology Module 2 Sustainability of Environmental Systems	**Teaching Language:** Italian
SSD (Subject Areas): Module 1 BIOS-05/A (former BIO/07 Ecology) Module 2 CEAR-08/C (former ICAR/12)	**CREDITS:** Module 1: 5 CFU Module 2: 5 CFU
Course year: 1	**Type of Educational Activity:** Module 1 Basic (A) Module 2 Characterising (B)

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:

The scientific-disciplinary contents consistent with the objectives of the Ecology module cover knowledge about the structure and functioning of an ecosystem, the state and change of natural and anthropised communities and ecosystems and their organisation in landscape systems in response to natural and anthropogenic disturbance, including global and climate change. In addition, conservation and sustainable management of ecosystems, analysis of environmental impacts and bioremediation, biomonitoring and biodiversity maintenance strategies, indicators of ecological quality, environmental impact assessment, ecological methods and strategies for environmental sustainability and environmental and ecosystem accounting, ecological implications of environmental restoration including nature-based solutions to ensure the health and well-being not only of ecosystems but also of humans are deepened.
The scientific-disciplinary contents consistent with the objectives of the Environmental Systems Sustainability module concern knowledge, methods and tools of technological and environmental design for the planning and meta-designing of interventions at different scales. Technology is assumed as an evolutionary factor to achieve ecosystem quality and generate habitats that respond to climate, housing, social, energy and production challenges, in the perspective of ecological and digital transition, according to environment and human-centred visions.

Objectives:
The aim of the integrated course 'The Ecological Structure of Settlements' - consisting of the modules 'Ecology' (5 CFU) and 'Sustainability of Environmental Systems' (5 CFU) - is to provide students with a cultural framework and the definition of appropriate methodologies for reading and interpreting environmental systems, understood as the outcome of the interaction between the anthropic and natural environment and eco-systemic conditions, providing students with the skills they need to address ecological-environmental issues.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
- interactive intermediate learning verification activities
- oral final examination and discussion of papers

SECOND YEAR

Course: Integrated course TERRITORIAL NETWORKS AND SUSTAINABILITY Module 1. New Territorial Economies Module 2. Enterprises, Innovation and Territory	**Teaching Language:** Italian
SSD (Subject Areas): Module 1. 08/CEAR-03 (ex ICAR/22) Module 2. 14/GSPS-08 B (ex SPS/10)	**CREDITS:** 10 Module 1. 5 CFU Module 2. 5 CFU
Course year: 2	**Type of Educational Activity:** Module 1 Characterising (B) Module 2 Related (C)
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The scientific-disciplinary contents concern: for the New Territorial Economies Module: - analysis of new forms of economy, by means of integrated and systemic approaches, also supported by spatial analysis techniques. - environmental and socio-economic assessments of programmes, plans, projects on natural and territorial resources, and historical-architectural and landscape assets, in a sustainable development perspective. for the Enterprises, Innovation and Territory Module - the analysis of the environment-society relationship at a sociological level, both from the point of view of urban and rural social systems and from the point of view of local communities, looking more specifically at the problems of sustainability and technological and social innovations. - from the methodological point of view, the area uses quantitative and qualitative approaches; it also produces and integrates specific skills in the analysis of case studies using geolocation techniques, with statistical data from various sources.	
Objectives: The objectives of integrated teaching are aimed at introducing theoretical notions concerning the development of new enterprises, the analysis of new economic models and the exploitation of opportunities that can be determined in urban and territorial transformation processes. In particular, the 'New Territorial Economies' module aims to provide students with theoretical, methodological and operational references to understand how new forms of economy can contribute to generating economic and non-economic values and to manage flexible and adaptive decision-making processes for developing territorial enterprises. The 'Enterprises, Innovation and Territory' module explores the specificity of contexts and the possibilities provided by new technologies, pursuing sustainable development objectives and providing theoretical and methodological references to understand the role of enterprise cultures and networks in sustainable technological innovation processes.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: Oral examination with discussion of the project elaboration.	

Course: URBAN PLANNING, ENVIRONMENT, AND LANDSCAPE	**Teaching Language:** Italian
SSD (Subject Areas): CEAR-12/B (ICAR/21)	**CREDITS:** 6
Course year: 2	**Type of Educational Activity:** Characterising (B)
Teaching Methods: In-person.	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: An in-depth exploration of principles, rules, methods, tools, implementation mechanisms, and practices within the domains of territorial planning; urban planning and design; landscape and environmental planning; urban projects;	

and the planning, design, and management of configurations and interventions aimed at the physical transformation of urban spaces, cities, territories, environments, and landscapes.

Objectives:
Acquisition of foundational knowledge and essential competencies necessary for the analysis, evaluation, and design of integrated strategies for urban and territorial rebalancing and regeneration, aimed at achieving ecological and landscape quality, risk protection, social equity and inclusion, socioeconomic development, the enhancement of public urban spaces, and the establishment of a new urban welfare system.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral Examination

Course: GRAPHICAL AND CARTOGRAPHIC DATA PROCESSING	**Teaching Language:** Italian
SSD (Subject Areas): CEAR-12/B (ICAR/21)	**CREDITS:** 4
Course year: 2	**Type of Educational Activity:** Characterising (B)

Teaching Methods:
In-person.

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The scientific disciplinary contents concern training to acquire the necessary skills to carry out research and experimentation activities, with significant and innovative outcomes to develop knowledge and interpretation of the current assets of the territory also in relation to the evolutions over time of the principles, rules, methods, tools and practices in the field of: spatial planning, urban, landscape and environmental planning and design; urban design and interventions in the physical transformation of urban space, the city, the territory, the environment and the landscape, for the deployment of integrated and inter-scalar strategies of urban and territorial rebalancing and regeneration.

Objectives:
The student is required to learn the theories, methods, techniques and tools for the graphic and cartographic treatment of data, as an essential prerequisite for the construction of an updated, shared, transmissible and implementable knowledge of contemporary territories. The collection of data, their selection, organization, management, processing and visualization in the GIS environment, are the first action for the construction of analytical-interpretive maps, and other forms of cartographic representation, with the main graphic post-production software, in order to report the complexity of both physical and relational dynamics and processes that characterize the urban space, the city, the territory, the environment and the landscape, in support of urban planning and design processes at all scales of the city and the territory, built also through processes of public participation and collaborative governance with the different actors present in the contexts.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral test and discussion of a work consisting of an analytical-interpretive exercise of a place

Course: Geographic Information Systems	**Teaching Language:** Italian
SSD (Subject Areas): ICAR/20 (CEAR-12/A)	**Credits:** 6
Course Year: 2	**Type of Educational Activity:** Characterizing (B)

Teaching Method:
In-presence

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
Contents concern:
- the analysis of regional, landscape and environmental heritages and settlement contexts; urban development, social and economic processes of transformation.
- inspired by principles and criteria of environmental, social and economic sustainability; openness and inclusiveness of decision-making processes; preservation and enhancement of biodiversity; risk reduction; climate change mitigation and adaptation; soil protection; sustainable mobility; and equitable accessibility to resources.

Teaching Objectives:
By encouraging students to a critical approach to knowledge tools and data processing with statistical and cartographic methods, the course provides theoretical and applied notions for the analysis of urban and spatial contexts, support to decision through spatial analysis tools and techniques developed in a GIS environment. In detail, the course presents sample techniques and procedures for identifying, understanding, and monitoring complex problems related to sustainable resource use, anthropogenic and natural hazards, climate change adaptation, biodiversity protection, and land use reduction. The course also provides methodologies and knowledge for the representation and interpretation of results.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Practical exercise and written test

Course: Lab n.2. PLANNING FOR SUSTAINABILITY Module 1. Planning tools for territorial transformation Module 2. Evaluation for decision-making processes Module 3. Architecture of the City and Territory	**Teaching Language:** Italian
SSD (Subject Areas): Module 1. CEAR-12B (ex ICAR/21) Module 2. CEAR-03/C (ex ICAR/22) Module 3. CEAR-09A (ex ICAR/14)	**CREDITS:** 14 CFU Module 1. 6 Module 2. 4 Module 3. 4
Course year: 2	**Type of Educational Activity:** Module 1: Characterising (B) Module 2: Characterising (B) Module 3: Related (C)

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The scientific disciplinary content concerns:

- Principles, rules, methods, tools, implementation mechanisms, and practices in the fields of: territorial planning, urban planning and design, landscape and environmental planning; urban design, planning, and management of arrangements and interventions related to the physical transformation of urban spaces, cities, territories, environments, and landscapes, with reference to sustainability principles and particular attention to climate change mitigation and adaptation.
- Integrated environmental, economic, and social assessment of the extra-economic impacts of programmes, plans, and projects on natural and territorial resources, historical-architectural and landscape assets, using monetary and multi-criteria quantitative-qualitative approaches, supported by spatial data analysis techniques, within a sustainable development framework.
- Methodological aspects concerning design theory; analytical-instrumental aspects related to the study of the distributional, typological, morphological, spatial, and linguistic characteristics of architecture and cities; compositional-design aspects, regarding the formal and settlement logic of elements and parts in relation to architectural figures and locations, the urban and natural context, infrastructures, and the territory.

Objectives:

The course focuses on the integration between urban planning and environmental issues, with particular reference to the sustainable regeneration of urban neighbourhoods and metropolitan areas. To understand how the planner, the evaluator, and the designer, with their various disciplinary skills, can support spatial/environmental planning processes sensitive to the context, the student deconstructs the perspective of decision-makers and is simultaneously encouraged to listen to and value the needs and demands of the resident communities, outlining tailored projects and policies. Students will be able to spatially represent both qualitative and quantitative data related to the issue of climate change and assess the impacts of possible mitigation and transformation actions.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Practical test with discussion of works and oral examination.

Course: Integrated course URBAN AND REGIONAL PLANNING Module 1 Urban planning and environmental legislation Modulo 2 Urban and Regional Planning Techniques	**Teaching Language:** Italian
SSD (Subject Areas): Module 1 GIUR-06/A (ex IUS/10) Module 2 CEAR-12/A (ex ICAR/20)	**CREDITS:** 12 CFU Module 1 6 Module 2 6
Course year: 2	**Type of Educational Activity:** Module 1 Characterising (B) Module 2 Characterising (B)

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The scientific and disciplinary contents are about:
- studies relating to the principles and general concepts of administrative law, the organization and activity of government and public administrations. It deals with territorial governance, regulation of the environment and landscape, public goods and cultural heritage, including intangible one, and public procurement.
-the analysis and interpretation of spatial structures and processes of transformation and governance for cities and territories, planning theories and conceptual devices for the elaboration of planning techniques, models and methods for the identification, definition and implementation of policies and actions pertaining relationships between space and society.

Objectives:
The main objective of the course is the knowledge of the issues and tools of territorial governance and the principles of urban planning and environmental law on the European, national and regional scale associated with them.
The course aims to provide, also through experiential tools and attention to the solutions presented by concrete cases, the skills necessary to: the interpretation of the sources of urban planning and environmental law; the evidence of the problems and the development of the main territorial governance tools; methods and techniques for the knowledge, evaluation and management of urban and territorial phenomena at all scales in a perspective inspired by principles and criteria of: environmental, social and economic sustainability; openness and inclusiveness of decision-making processes; preservation and enhancement of biodiversity; risk reduction; preservation and enhancement of biodiversity; soil protection; sustainable mobility; equal access to resources.

Propaedeuticities:
None
Is a propaedeuticity for:
Nothing

Types of examinations and other tests:
Written and oral test and discussion of the practical exercise developed during the course

THIRD YEAR

Course: Lab n.3.1 SUSTAINABLE DESIGN Module 1 Environmental design Module 2 Energy systems for territory and community	**Teaching Language:** Italian
SSD (Subject Areas): Module 1 CEAR-08/C (ex ICAR/12) Module 2 IIND-07/B (ex ING IND/11)	**CREDITS:** Module 1: 6 CFU Module 2: 4 CFU
Course year: 3	**Type of Educational Activity:** Module 1: Related (C) Module 2: Related (C)
Teaching Methods: In-person	
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The scientific-disciplinary content in line with the objectives of the Environmental Design module concerns knowledge, methods and tools of technological and environmental design for planning, meta-design, conceptualization, implementation and management of interventions at different scales. The methodologies are based on: design testing and feasibility, measurability, replicability of outcomes; systemic, demand-performance and process approaches; decision-making strategies coherent with objectives of effectiveness and sustainability, in the perspective of ecological and digital transition and according to human and environment-centred visions to respond to climate, housing, social, energy, and production related challenges. The Energy Systems for Land and Community module is related to Technical Environmental Physics (IIND-07/B), an area covering the fundamental and applied aspects of thermodynamics, heat transmission, energetics, and thermofluidic dynamics. More specifically, included in it are skills related to thermodynamic analysis of energy processes and their environmental impacts, principles of sustainable energy conversion and energy utilization, including those based on renewable sources, energy management and energy model monitoring and development techniques, and energy efficiency.	
Objectives: The objective of lab n.3.1 - consisting of the Environmental Design (6CFU) and Energy Systems for Land and Community (4 CFU) Modules - is to provide students with advanced concepts and methodological tools for environmental design and sustainable land-use layouts, considering actions for interventions aimed at both the integration of climate adaptation and mitigation and sustainable development objectives, and the reduction of vulnerabilities and increase of resilience in urban and peri-urban areas. The territory becomes the place in which to adopt a circular approach to sustainability, also with regard to energy systems, and thus to renewable energy use and conversion. The student has to understand the criteria, methods and tools of environmental design and energy systems, with particular reference to renewable sources, in the conditions defined by knowledge models and in the development of the project, as well as the problems related to design and technological choices in relation to the demanding framework, requirements and the sociocultural, technical-productive and environmental context. The student must be able to design and manage interventions within a framework of sustainable development and cognitive and design testing, referring to emerging aspects of environmental, climate, energy and digital culture in the context of eco-sustainable design and redevelopment culture.	
Propaedeuticities: None **Is a propaedeuticity for:** None	
Types of examinations and other tests: - interactive intermediate learning evaluation activities; - final oral examination and discussion of assignments.	

Course: Integrated course DIGITAL CITIES AND COMMUNITIES Module 1 Digital society and territorial processes Module 2 Intelligent systems for data management	**Teaching Language:** Italian

SSD (Subject Areas): Module 1 14/GSPS-08/B (ex SPS 10) Module 2 INFO-01/A (ex INF/01)		**CREDITS:** 10 Module 1 5 CFU Module 2 5 CFU
Course year: 3	**Type of Educational Activity:** Module 1: Characterising (B) Module 2: Basic (A)	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The scientific disciplinary contents concern: - the relationship between society and the issues of the environment and territorial development, the evolution of urban and rural systems and the consequences on the social fabric, as well as the analysis of the dynamics of social life in its space-time dimension and in the relationship with natural and anthropic materiality, both from the point of view of local institutions and from the point of view of communities and organizations at various scales, urban and rural. Therefore, the problems of housing, neighborhoods, urban times and mobility in advanced metropolitan societies, the sociology of migrations, borders and ethnic relations, as well as the environment and sustainability, including the impact of public policies, management of the territory and natural and anthropic risk, mobilizations, participatory processes and daily practices, relationships with the animal and plant world are included. - scientific and training activities related to the design, implementation, management and use of information systems. The skills concern the conceptual bases and applications of computer science, used in the various disciplines for problem solving through the computational approach. They include the following areas: - management and analysis of data and knowledge (databases; information systems; data mining; process mining; information retrieval; recommendation systems); - artificial intelligence (foundational aspects; machine learning; automatic reasoning and knowledge representation; exploration of choice spaces; intelligent agents; artificial vision; natural language processing).		
Objectives: The Digital Society and Territorial Processes module aims to provide students with an understanding of the fundamental aspects of contemporary digital society, its history, its current structure and observable trends. The objective is to provide students with the basic notions to understand the processes of social production in a digital environment and to guide spatial planning and territorial development processes in line with social innovation and the potential provided by ICT. The objective of the Intelligent Data Management Systems module is to provide students with artificial intelligence techniques and approaches for exploring data spread in the digital society, providing tools to support decision-making processes in spatial planning and territorial development.		
Propaedeuticities: Information Technology **Is a propaedeuticity for:** None		
Types of examinations and other tests: W Oral examination		

Course: RURAL LAND ANALYSIS	**Teaching Language:** Italian	
SSD (Subject Areas): AGRI-04/C (ex AGR-10)		**CREDITS:** 5
Course year: 3	**Type of Educational Activity:** Basic (A)	
Teaching Methods: In-person		
Contents extracted from the SSD declaratory consistent with the training objectives of the course: The educational-training activities of the field concern rural construction and agroforestry and, in particular, the aspects of analysis, assessment, regeneration, modelling, planning and design applied to land, environment, landscape, rural and green infrastructure, renewable energy, urban-rural transition spaces, green system, including technical green, nature-based solutions and ecosystem services. Evaluation of plans and interventions covers environment, land and landscape.		
Objectives: The objective of the course is to provide students with tools and methods for the analysis of land and its components atmosphere, soil and hydrosphere. Tools will be provided to operate the analysis of spatial processes and sustainability with a quantitative approach on the basis of models, also in view of climate change		

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Written test and oral interview

Course: Lab n.3.2 PLANNING FOR THE URBAN METABOLISM Module 1 Circular Urbanism Module 2 Technological Design of Life Cycles Module 3 Multidimensional Evaluations	**Teaching Language:** Italian
SSD (Subject Areas): Module 1 CEAR-12/B (ICAR/21) Module 2 CEAR-08/C (ICAR/12) Module 3 CEAR-03/C (ICAR/22)	**CREDITS:** 15 CFU Module 1 6 Module 2 6 Module 3 3
Course year: 3	**Type of Educational Activity:** Characterising (B) Characterising (B) Related (C)

Teaching Methods:
In-person

Contents extracted from the SSD declaratory consistent with the training objectives of the course:
The scientific contents concern:
- conceptual apparatuses, theories, methods, techniques and models for the analysis, evaluation, planning and design of cities, territories, landscapes and environments, at different scales, through transdisciplinary approaches and the use of new digital technologies. The analytical and design devices are oriented towards the protection, enhancement, transformation and regeneration of cities, territories, landscapes and environments.
- the transfer of a systemic, processual and experimental design approach oriented towards the quality of the built environment in relation to anthropic and natural contexts, according to principles of sustainability, circularity, inclusiveness, accessibility, resilience and climate neutrality objectives. Specific contents concern the technological culture of architectural design and environmental design, technological and socio-technical innovation, sustainable use of energy and resources for eco-efficient habitats.
- the development of methodologies for evaluation with integrated and systemic approaches, also supported by spatial analysis techniques, and for environmental and economic-social evaluations of natural and territorial resources, historical-architectural and landscape assets, in a sustainable development perspective.

Objectives:
The laboratory aims to provide students with the basic skills to manage territorial planning in an urban design perspective inspired by the principles of circularity. More in general, the course is part of the debate concerning Urban Metabolism, declining the theoretical aspects through the experimentation of design scenarios referring to a specific case study. The experimentation must include a concept design that manages -through spatial analysis and representation- information flows, actors and evaluation techniques between design alternatives.

Propaedeuticities:
None
Is a propaedeuticity for:
None

Types of examinations and other tests:
Oral with the discussion of an urban design experimentation

Course: URBAN AND TERRITORIAL POLICIES	**Teaching Language:** Italian
SSD (Subject Areas): CEAR-12/A (ex SSD ICAR/20)	**CREDITS:** 6 CFU
Course year: 3	**Type of Educational Activity:** Characterising (B)

Teaching Methods: In-person
Contents extracted from the SSD declaratory consistent with the training objectives of the course: Scientific-disciplinary contents consistent with the educational objectives of the course include: conceptual apparatuses, theories, methods, techniques and models for policy analysis, evaluation and design within transdisciplinary approaches. In this framework, specific objectives referable to Urban Technique and Planning concern the definition and implementation of policies, programs and actions pertaining to the relationships between space and society.
Objectives: The course aims to provide knowledge related to the studies, methodologies and tools specific to urban and territorial policies. Students will have to demonstrate that they have learned the ability to analyze, describe and interpret content, stages and processes of construction and implementation of different types of urban and territorial policies. Students will be expected to develop critical skills useful in deconstructing and reworking public policies with attention to vocabulary, conceptualizations and proposal formulation.
Propaedeuticities: None **Is a propaedeuticity for:** None
Types of examinations and other tests: The verification of learning involves the oral examination on disciplinary literature and case-studies presented during the lectures. The final assessment will integrate that one gained during the semester in relation to active participation in class and the development of the practical exercise.

ANNEX 2.2

Training Activity: under Art. 10, c. 5, letter d	**Training Activity Language:** Italian	
Content of the activities consistent with the training objectives of the course: Further training activities in accordance with Art. 10, c. 5, letter d: - Additional language skills - Other knowledge useful for job placement - IT and telematics skills - Training and orientation periods	**CFU:** 4 (Communication and Media)+ 3 to be activated at the student's choice among the different kind of Further Activities provided.	
Course year: 1, 3		**Type of Training Activity:** F
Teaching Methods: In-person (Communication and Media)		
Objectives: The activities provided for under art. 10, c. 5, letter d contribute in part to the achievement of computer-based training objectives (4 cfu) in part to the achievement of training objectives that fall under the different types of Further Activities provided (linguistic and/or computer-based and/or vocational training objectives for the world of work]		
Propaedeuticities: None **Is a propaedeuticity for:** None		
Types of examinations and other tests: Aptitude		