



SETOF Soil Erosion and TOrrential Flood
Prevention: Curriculum Development at the
Universities of Western Balkan Countries

Analysis and elaboration of bachelor and master curricula in field of soil and torrent control in Italy

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(National Research Council – ISAFOM)**



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Bachelor and master degrees with disciplines in soil erosion and torrent control in Italy

FOREST SCIENCES

**Hydraulics, Surface hydrology, Torrent control (check-dams),
Soil erosion, Naturalistic engineering**

CIVIL ENGINEERING

**Hydraulics, Hydrology, Hydraulic constructions
(dams, check-dams, levees, bridges, etc.)**

GEOLOGICAL SCIENCES

Geomorphology, Hydrogeology, Sedimentology





UNIVERSITIES with courses on Forest Sciences (or similar)

Milano

Torino

Firenze

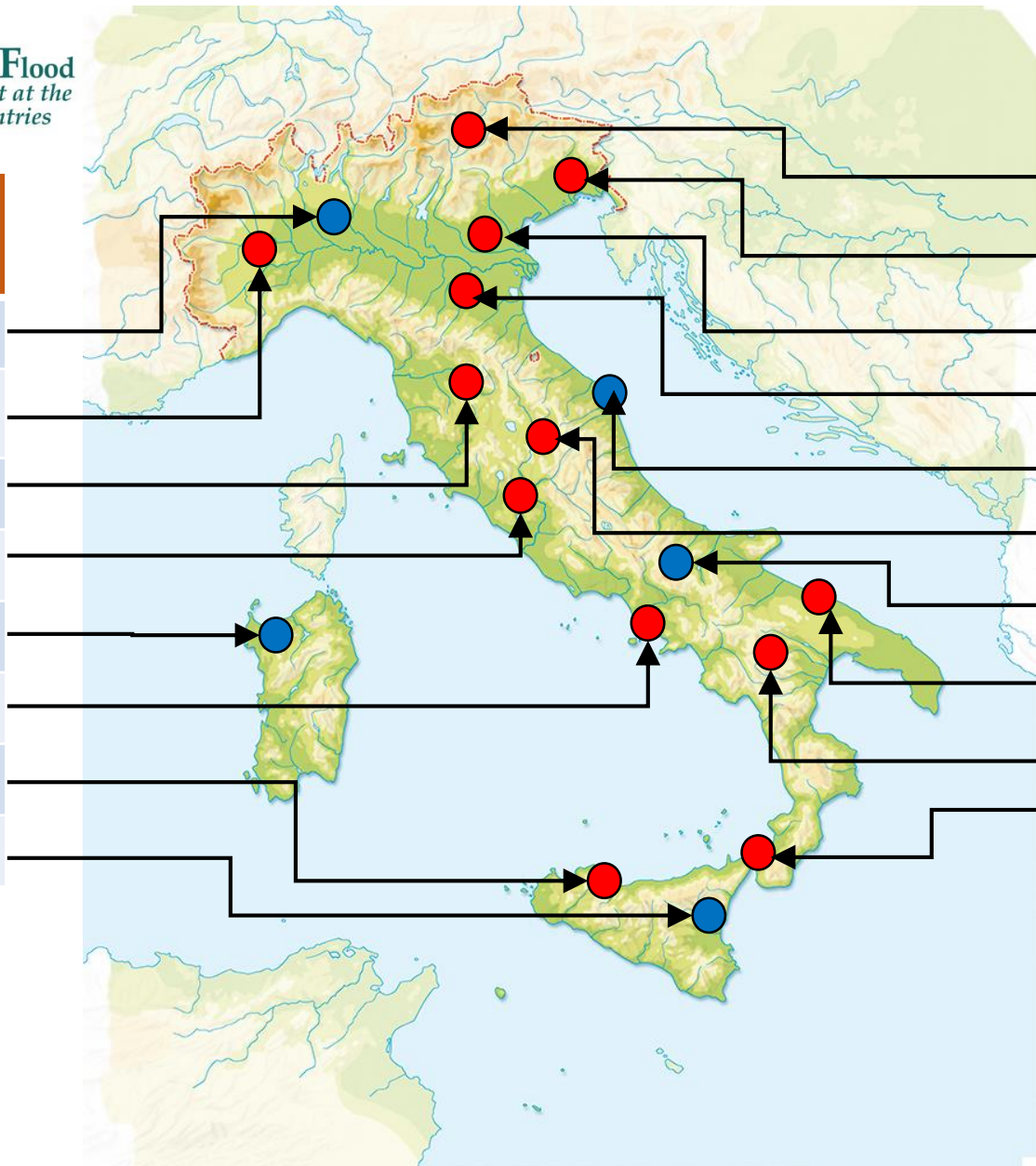
Viterbo

Sassari

Napoli

Palermo

Catania



UNIVERSITIES with courses on Forest Sciences (or similar)

Bolzano

Udine

Padova

Bologna

Ancona

Perugia

Campobasso

Bari

Potenza

Reggio Calabria





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The University Mediterranea of Reggio Calabria

The Department of Agriculture



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Agricultural Sciences and Technologies

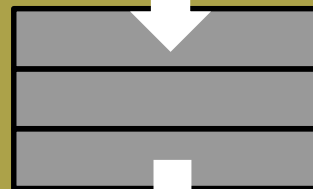
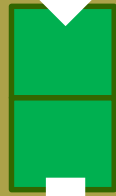
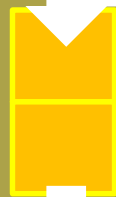
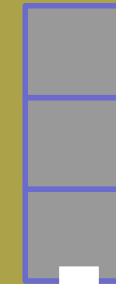
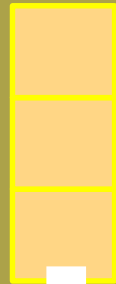
Environmental and Forest Sciences

Food Sciences and technologies

Bachelor Degree
3 Years
180 CFU

Master Degree
2 Years
120 CFU

PHD
3 Years





Environmental and Forest Sciences – BACHELOR DEGREE

First year

COURSE	ECTS	SSD	SEMESTER
ELEMENTS OF MATHEMATICS	6	MAT/05	First semester
CHEMISTRY	8	CHIM/03	First semester
ENGLISH			First semester
- ENGLISH	3		First semester
- ENGLISH	3		First semester
GENETICA	6	AGR/07	Second semester
PLANT BIOLOGY	8	BIO/03	Second semester
ELEMENTI DI FISICA	6	FIS/01	Second semester
Forest Botany	6	BIO/03	Second semester

Second year

COURSE	ECTS	SSD	SEMESTER
FOREST ENTOMOLOGY	6	AGR/11	First semester
Mountain Agronomy and Zootechnics			First semester
- MOUNTAIN AGRONOMY	6	AGR/02	First semester
- PRINCIPI DI NUTRIZIONE ED ALIMENTAZIONE ANIMALE IN AMBIENTE MONTANO	6	AGR/18	First semester
FORESTAL ECONOMICS AND POLICY			First semester
- ELEMENTS OF FORESTAL ECONOMICS	6	AGR/01	First semester
Forest Chemistry			Second semester
- PLANT MOLECULAR PHYSIOLOGY	6	AGR/13	Second semester
- Chemistry of the Forest Floor	6	AGR/13	Second semester
Forest Plant Pathology	6	AGR/12	Second semester
FORESTAL ECONOMICS AND POLICY			Second semester
- FORESTAL ECONOMICS AND POLICY	6	AGR/01	Second semester
- FORESTAL AND ENVIROMENTAL LAW	6	IUS/03	Second semester

Third year

COURSE	ECTS	SSD	SEMESTER
General Microbiology	6	AGR/16	First semester
Dendrometry and Principles of Forest Arrangement	6	AGR/05	First semester
FOREST ECOLOGY, SILVICULTURE AND MANAGEMENT OF PROTECTED AREAS			First semester
- FOREST ECOLOGY AND GENERAL SILVICULTURE	6	AGR/05	First semester
- MANAGEMENT OF PROTECTED AREAS	3	AGR/05	First semester
Forest Appraisal	6	AGR/01	First semester
Logging Mechanization	6	AGR/09	First semester
CAD LABORATORY	3		First semester
MATERIE A SCELTA	12		First semester
APPRENTICESHIP TRAINING AND GUIDANCE	2		First semester
STAGE AND ESTERNAL TRAINING	2		First semester
FINAL TEST	4		First semester
FORESTRY BUILDINGS AND LANDSCAPE			Second semester
- COSTRUZIONI FORESTALI E PAESAGGIO	6	AGR/10	Second semester
- LAND SURVEYING AND REPRESENTATION	6	AGR/10	Second semester
IDRAULICA, IDROLOGIA E SISTEMAZIONI IDRAULICO FORESTALI			Second semester
- IDRAULICA E IDROLOGIA FORESTALE	6	AGR/08	Second semester
- SISTEMAZIONI IDRAULICO FORESTALI	6	AGR/08	Second semester





Module: IDRAULICA E IDROLOGIA FORESTALE

Professor	<u>SANTO MARCELLO ZIMBONE</u>
Objectives	<p>Within the professional education in Environmental and Forest Sciences, the course provides a basic and specific knowledge on:</p> <ul style="list-style-type: none">- hydrostatics, hydraulics of pressured pipelines and open channels, outflow and supply from groundwater;- rainfall measurements and data processing, measure and estimation of fundamental hydrological processes, analysis of rainfall-runoff modeling and peak discharge estimation. <p>Acquisition of knowledge on:</p> <ul style="list-style-type: none">- basic tools as well as theoretical and practical methods for analysis of hydrological processes and design of river control works- solution of the most relevant problems concerning control and mitigation of hydrogeological risks in agro-forest areas.

Module: SISTEMAZIONI IDRAULICO FORESTALI

Professor	<u>PAOLO PORTO</u>
Objectives	<p>Within the professional education in Environmental and Forest Sciences, the course provides a basic and specific knowledge on:</p> <ul style="list-style-type: none">- methods for watershed and hydrographic network characterization, estimation and measurement of sediment transport, analysis of criteria for bedslope stabilization and torrent control works design (with particular reference to the equilibrium bedslope evaluation in mountain torrents);- study of grade-control structures (types of check-dams and sills) and criteria for their hydraulic and structural sizing. <p>Acquisition of knowledge on:</p> <ul style="list-style-type: none">- basic tools as well as theoretical and practical methods for analysis of hydrological processes and design of river control works- solution of the most relevant problems concerning control and mitigation of hydrogeological risks in agro-forest areas.





First year

COURSE	ECTS	SSD	SEMESTER
Environmental Chemistry of Urban and Forest Ecosystems	6	AGR/13	First semester
Soil Protection and Conservation and Watersheds Planning			First semester
- Watersheds Planning and Management	3	AGR/08	First semester
- Soil Protection and Conservation and Hydraulic Rehabilitation	6	AGR/08	First semester
Plant diseases and phytosanitary protection			First semester
- MALATTIE DEL VERDE E DELLE PIANTE ORNAMENTALI	6	AGR/12	First semester
FOREST GEOBOTANY	6	BIO/03	First semester
Laboratory of GIS	5		First semester
Plant diseases and phytosanitary protection			Second semester
- Integrate Protection of the Forest Systems	3	AGR/11	Second semester
SOIL ECOLOGY	6	AGR/13	Second semester
Natural and Cultivated Mountain Systems	6	AGR/02	Second semester
Management of Forest Systems and Safety in Forestry Operations			Second semester
- Silviculture and arboriculture for timber production	9	AGR/05	Second semester
- Wood Harvesting and Safety in Forestry Operations	3	AGR/09	Second semester

Environmental and Forest Sciences – MASTER DEGREE

Second year

COURSE	ECTS	SSD	SEMESTER
Forest Fire Protection	6	AGR/05	First semester
ECONOMICS AND ENVIRONMENT APPRAISAL	6	AGR/01	First semester
Ethology and wildlife management	6	AGR/19	First semester
Landscape planning and infrastructures in agro-forestry areas	6	AGR/10	First semester
MATERIE A SCELTA	12		First semester
APPRENTICESHIP TRAINING AND GUIDANCE	3		Second semester
STAGE AND ESTERNAL TRAINING	9		Second semester
Final project	13		Second semester





Module: Soil Protection and Conservation and Hydraulic Rehabilitation

Professor	<u>PAOLO PORTO</u>
Objectives	<p>Within the professional education in Environmental and Forest Sciences, the course provides a basic and specific knowledge on:</p> <ul style="list-style-type: none">- basic methodologies and technologies to individuate the main agents and atmospheric phenomena causing water erosion;- basic methodologies aimed at planning and managing watersheds using an integrated approach. <p>Acquisition of knowledge on:</p> <ul style="list-style-type: none">- theoretical and practical methods for analysis of hydrological processes responsible for soil loss and hydrogeological disasters in mountain areas- solution of the most relevant problems concerning control and mitigation of hydrogeological risks in mountain areas.

Soil Protection and Conservation and Watersheds Planning

Professor	<u>GIUSEPPE BOMBINO</u>
Objectives	<p>The course aims to provide the basic knowledge to analyze the different management planning practices of within a watershed area. It pays attention to the physiographic unit "watershed", to the cause-effect relationships that govern the physical phenomena taking place in it. The effects of the anthropic activities on water resources are discussed. The principles and aims of planning activity to be applied within the agri-forest area, for achieving a rational water resource management, are dealt. Therefore, in view of the law framework, the possible measures to be applied in the semi-arid Mediterranean context are also examined, in order to achieve effective river basin planning, including to the possible effects of hydraulic systems on the ecosystem .</p>





Environmental and Forest Sciences – BACHELOR DEGREE

Third year

COURSE	ECTS	SSD	SEMESTER
General Microbiology	6	AGR/16	First semester
Dendrometry and Principles of Forest Arrangement	6	AGR/05	First semester
FOREST ECOLOGY, SILVICULTURE AND MANAGEMENT OF PROTECTED AREAS			First semester
- FOREST ECOLOGY AND GENERAL SILVICULTURE	6	AGR/05	First semester
- MANAGEMENT OF PROTECTED AREAS	3	AGR/05	First semester
Forest Appraisal	6	AGR/01	First semester
Logging Mechanization	6	AGR/09	First semester
CAD LABORATORY	3		First semester
MATERIE A SCELTA	12		First semester
APPRENTICESHIP TRAINING AND GUIDANCE	2		First semester
STAGE AND ESTERNAL TRAINING	2		First semester
FINAL TEST	4		First semester
FORESTRY BUILDINGS AND LANDSCAPE			Second semester
- COSTRUZIONI FORESTALI E PAESAGGIO	6	AGR/10	Second semester
- LAND SURVEYING AND REPRESENTATION	6	AGR/10	Second semester
IDRAULICA, IDROLOGIA E SISTEMAZIONI IDRAULICO FORESTALI			Second semester
- IDRAULICA E IDROLOGIA FORESTALE	6	AGR/08	Second semester
- SISTEMAZIONI IDRAULICO FORESTALI	6	AGR/08	Second semester

Environmental and Forest Sciences – MASTER DEGREE

Second year

COURSE	ECTS	SSD	SEMESTER
Forest Fire Protection	6	AGR/05	First semester
ECONOMICS AND ENVIRONMENT APPRAISAL	6	AGR/01	First semester
Ethology and wildlife management	6	AGR/19	First semester
Landscape planning and infrastructures in agro-forestry areas	6	AGR/10	First semester
MATERIE A SCELTA	12		First semester
APPRENTICESHIP TRAINING AND GUIDANCE	3		Second semester
STAGE AND ESTERNAL TRAINING	9		Second semester
Final project	13		Second semester

STAGE AND EXTERNAL TRAINING





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Environmental and Forest Sciences

STAGE AND EXTERNAL TRAINING

Examples at the University of Florence



Examples at the University of Reggio Calabria



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Examples at the University of Reggio Calabria



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Examples at the University of Reggio Calabria



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A special case of master curriculum with disciplines in soil erosion and torrent control in Italy



Free University of Bozen-Bolzano

Sustainable Management of Geo-hydrological Risk in Mountain Environments

ECTS: 60

Duration: 1 year (from September 2018 to July 2019)

Language: Italian

Places available: 15-30

Campus: Bolzano

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The Master is organized with the co-operation of Maccaferri Innovation Center (MIC)

The master is open to post-grad students in agricultural and forest sciences, engineering, environmental sciences, geology.

6 INTEGRATED COURSES ARE CONSIDERED

1. Evaluation of geo-hydrologic risk;
2. Evaluation of mitigation strategies;
3. Designing of intervention for mitigation;
4. Building and management of hydraulic structures;
5. Non-structural intervention for mitigation;
6. Economical evaluation of strategy for mitigation.





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Questions? Suggestions?



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