



University of Padova

**School of Agricultural Sciences  
and Veterinary Medicine**

**CATALOGUE  
OF COURSE  
UNITS HELD  
IN ENGLISH**

**FOR ERASMUS, FOREIGN AND ITALIAN STUDENTS**

**academic year 2014 > 2015**

---

## SECOND-CYCLE DEGREES WITH ALL THE COURSE UNITS HELD IN ENGLISH

FOREST SCIENCES

---

## FIRST-CYCLE DEGREES WITH SOME COURSE UNITS HELD IN ENGLISH

SCIENCE AND CULTURE OF GASTRONOMY AND CATERING

---

## 5 YEARS SINGLE-CYCLE DEGREES WITH SOME COURSE UNITS HELD IN ENGLISH

VETERINARY MEDICINE

---

## SECOND-CYCLE DEGREES WITH SOME COURSE UNITS HELD IN ENGLISH

AGRICULTURAL SCIENCE AND TECHNOLOGY

ANIMAL SCIENCE AND TECHNOLOGY

FORESTRY AND ENVIRONMENTAL SCIENCE

LAND AND ENVIRONMENTAL SCIENCE AND TECHNOLOGY

### FOR COURSES BASED ON A SEMESTER ORGANIZATION

**First semester:** October 1st, 2014 to January 24th, 2015

Winter exams session: January 26th, 2015 to February 28th, 2015

**Second semester:** March 2nd, 2015 to June 12th, 2015

Summer exams session: June 15th, 2015 to July 25th, 2015

Extra exams session: August 24th, 2015 to September 23th 2015

### FOR COURSES BASED ON A TRIMESTER ORGANIZATION

**First trimester:** October 1st, 2014 to December 6th, 2014

Winter exams session: December 9th, 2014 to January 10th, 2015

**Second trimester:** January 12th, 2015 to March 14th, 2015

Spring exams session: March 16th, 2015 to April 11th, 2015

**Third trimester:** April 13th, 2015 to June 20th, 2015

Summer exams session: June 22th, 2015 to July 25th, 2015

Extra exams session: August 24th, 2015 to September 23th 2015


---

# INDEX

---

ANIMAL HUSBANDRY (CLINICAL MEDICINE)

---

ANTHROPOLOGY OF FOOD

---

APPLIED GEOPHYSICS

---

BIODIVERSITY AND ECOSYSTEM SERVICES  
IN FOREST

---

BIOMASS AND BIOENERGY

---

BUSINESS PLAN

---

CLIMATE CHANGE AND TROPICAL  
FORESTRY: MONITORING AND POLICIES

---

CLINICS IN REPRODUCTION (CLINICAL  
MEDICINE)

---

ECONOMICS OF FOREST RESOURCES

---

ENVIRONMENTAL MINERALOGY

---

FOREST PATHOLOGY AND WOOD  
ALTERATIONS

---

FOREST POLICIES AND GOVERNANCE:  
MANAGING CONFLICTS

---

FOREST POLICY

---

GLOBAL HISTORY OF FOOD

---

HUMAN RESOURCES MANAGEMENT

---

INSECT ECOLOGY AND MANAGEMENT

---

INTEGRATED WATERSHED MANAGEMENT

---

INTRODUCTION TO GIS

---

ITALIAN FOOD, CUISINE AND DIETS

---

LIVESTOCK BIODIVERSITY AND ANIMAL  
FOOD SAFETY

---

MANAGEMENT AND TREATMENT IN  
MOUNTAIN AND MEDITERRANEAN FORESTS

---

MANAGEMENT OF MOUNTAIN FORESTS AND  
LOGGING SYSTEMS

---

MARKETING

---

MEAT SCIENCE AND TECHNOLOGY

---

MOUNTAIN FLUVIAL MORPHOLOGY AND  
STREAM RESTORATION

---

RESEARCH PLANNING

---

SILVICULTURAL SYSTEMS

---

SILVICULTURE IN MEDITERRANEAN  
MOUNTAIN FORESTS

---

SOCIAL RESPONSABILITY BY PUBLIC AND  
PRIVATE ORGANIZATIONS

---

SOCIETAL MARKETING: FOREST  
CERTIFICATION AND OTHER TOOLS

---

SOIL AND WATER RESOURCES  
MANAGEMENT

---

---

VALUATION AND ASSESSMENT OF FOREST  
AND ENVIRONMENTAL GOODS AND  
SERVICES

---

VEGETATION-ATMOSPHERE INTERACTIONS

---

VETERINARY GENERAL PATHOLOGY

---

WILDFIRE AND NATURAL DISTURBANCE  
ECOLOGY AND MANAGEMENT

---

WILDLIFE CONSERVATION AND  
MANAGEMENT

---

WOOD HARVESTING AND TRANSPORTATION  
SYSTEMS

---

## ANIMAL HUSBANDRY (CLINICAL MEDICINE)

5 years single-cycle degree in Veterinary Medicine

Language: English

Teaching period: second semester

Lecturer: Paolo Berzaghi

Credits: 5 CFU/ECTS

Note: this is a module of Zootecnica speciale (13 CFU/ECTS). Only this module is held in English and can not be registered alone.

Campus: Legnaro (PD)

1

### Prerequisites

The student must have acquired knowledge on anatomy and physiology of the digestive tract and the mammary gland of farm animals (cattle, pigs, sheep and goats) and on anatomy and physiology of the digestive tract and reproductive apparatus of poultry and rabbit species. The student must be able to identify different feeds, and to know their chemical composition and nutritional value. Propedeutic course: Animal feeding and nutrition (Food safety); Veterinary physiology and ethology 2.

### Programme

Dairy Cows. Milk market in Italy and Europe and future production perspective. Feeding management: ration balancing and feeding techniques. Efficiency parameters for production and reproduction. Weaning and heifer management. Parturition preparation with the objective of preventing metabolic disorders. Milk quality. Dry period.  
Beef cattle: the meat market in Italy and Europe and future production perspective. Production techniques in relation of the stocker type. Production goals. Feeding of fattening beef and meat quality.  
Swine: Pork market in Italy and Europe and future production perspective. Pork quality in relation to the production of cured ham. Managing sows for maximum productive and

reproductive performances. Raising young sows. Pregnancy and parturition. Managing piglets. Lactation and dry period. Weaning and fattening.

Goats: Managing dairy goats.

### Examination

Written exam.

ANIMAL WELFARE AND QUALITY OF PRODUCTION - written exam at the end of the course

MANAGEMENT AND BREEDING OF COMPANION ANIMALS - written exam at the end of the course

### More information

<http://en.didattica.unipd.it/didattica/2014/MV0991/2011/000ZZ/AVP3051627/N0>

## ANTHROPOLOGY OF FOOD

First-cycle degree in Science and Culture of Gastronomy and Catering

Language: English

Teaching period: first semester

Lecturer: Michela Zago

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

2

### Prerequisites

None.

### Programme

According to the historico-religious and anthropological perspective, the course focuses on food behaviours from antiquity to the contemporary world, with special attention to: the taxonomies, interdictions and choices of food in relation to cultural and religious models; the relationship between human and divine food and between food and social body; food as a constitutive element of the creation and reproduction of local, regional and national identities; the notions of taste and distaste.

### Examination

Oral examination.

### More information

<http://en.didattica.unipd.it/didattica/2014/IF0365/2008/000ZZ/AVP3050145/N0>

## APPLIED GEOPHYSICS

Second-cycle degree in Land and Environment Science and Technology

Language: English

Teaching period: first semester

Lecturer: Giorgio Cassiani

Credits: 8 CFU/ECTS

Campus: Padova

3

### Prerequisites

Essential prerequisites include: basics of mathematics and physics.

### Programme

The course will be composed of two parts: Part 1: introduction to exploration geophysics, will introduce the general concepts of Geophysics applied with particular regard to:

- physical principles of the main electrical, electromagnetic, seismic, magnetic and gravimetric methods
- concepts of resolution and penetration
- general definition of geophysical inversion
- basic concepts about data acquisition of the main methodologies

Part 2: exploration methods for environmental purposes. The methods that will be discussed are:

- traditional and tomographic geo-electrics, particularly with special regard to hydrological and hydrogeological applications
- spectral induced polarization with applications to identify contaminants in the subsurface
- low frequency electromagnetic methods for contaminated site exploration and identification of structures in the first meters of the subsoil
- GPR and its potential applications to stratigraphy, engineering, hydrology, with a particular focus on processing and interpretation
- advanced high-resolution seismic for structural and stratigraphic definition of the top tens to hundreds of metres
- seismic refraction and surface waves seismic engineering and their geotechnical applications
- seismic, radar and geoelectrical cross-hole geophysical methods

- well logs and their environmental and hydrological applications.  
For all methods special attention will be given to their applications, with examples from literature and from the experience of the lecturer. Demonstration will be given of the main methods, followed by processing, inversion and interpretation of laboratory data.

#### **Examination**

Oral examination including also the discussion of a scientific paper to be chosen among the ones previously distributed to students.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/IF0321/2008/000ZZ/AVP3054118/N0>

## **BIODIVERSITY AND ECOSYSTEM SERVICES IN FOREST**

Second-cycle degree in Forest Science

Language: English

Teaching period: first semester

Lecturer: Lorenzo Marini

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

4

#### **Prerequisites**

None.

#### **Programme**

The course will provide the students with knowledge of the origin and distribution of biodiversity, methodologies to sample, measure and analyze biodiversity data, and the consequences of biodiversity loss on ecosystem functioning and society. 1. The course is divided in five units: Biodiversity: definitions, sampling and analysis 2. Spatial distribution of biodiversity 3. Natural and anthropogenic drivers of biodiversity 4. Biodiversity, ecosystem functioning, and ecosystem services 5. Conservation and mitigation measures.

#### **Examination**

Written examination and oral presentation of an individual project of conservation biology.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/003LE/AVP4060699/N0>

## BIOMASS AND BIOENERGY

Second-cycle degree in Agricultural Science and Technology

Language: English

Teaching period: first semester

Lecturer: Mario Malagoli

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

5

### Prerequisites

English language B2 level.

### Programme

1- Biomass definition. Energy potential contribution of biomass. Energy. Solar Energy. Useful solar radiation. Photosynthetic efficiency. Net primary production Carbon cycle.

2- Global energy demand. Renewable energy: amount and role. Energy from biomass. Current use and future scenarios. Conversion processes of biomass

3- Thermochemical conversion. Combustion. Pyrolysis. Gasification. Physico-chemical conversion. Esterification. Biodiesel.

4- Biological conversion. Fermentation.

Anaerobic digestion. Biofuels. Composting

5- Excursions: Field chipping systems, Biodiesel production factory, Biogas production

6- Excursions: Biomass heating power plant, Composting process.

### Examination

Students will have to give a brief presentation on the articles they studied.

Final grade will be based on the presentation and a written test.

### More information

<http://en.didattica.unipd.it/didattica/2014/AG0063/2008/000ZZ/AGO2044581/N0>

## BUSINESS PLAN

First-cycle degree in Science and culture of Gastronomy and Catering

Language: English

Teaching period: second semester

Lecturer: Andrea Menini

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

6

### Prerequisites

Specific knowledge:

- industry analysis

- strategy

- accounting

- cost accounting

Generic competences:

- work with others

- work with information

- work with technology (word-excel-powerpoint or similar)

- learning to learn

### Programme

Market analysis Demand analysis Pricing The operational plan Economic analysis Financial analysis

Demand analysis

Pricing

The operational plan

Economic analysis

Financial analysis

### Examination

Develop a business plan and presenting it.

### More information

<http://en.didattica.unipd.it/didattica/2014/IF0365/2008/000ZZ/AVP3050095/N0>



## CLIMATE CHANGE AND TROPICAL FORESTRY: MONITORING AND POLICIES

Second-cycle degree in Forestry and Environmental Science  
Language: English  
Teaching period: first semester  
Lecturer: Laura Secco  
Credits: 6 CFU/ECTS  
Campus: Legnaro (PD)

7

### Prerequisites

A basic forest background (both about forest management and forest policy at international level) is strongly advisable.

### Programme

Deforestation is a major contributor to human-induced greenhouse gas emissions. This course introduces participants to the role of forests in regulating the climate, the impacts of deforestation and forest degradation on global atmospheric carbon, the rapidly changing framework of policy and tools for managing forest carbon, and implications for conservation and forest-dependent peoples.

### Examination

The evaluation is based on two components:

1. Completion of compulsory e-Modules (see evaluation criteria for details), on the basis of an active participation to discussion for a on-line, by respecting deadlines, and on the basis of quality of posts;
2. Satisfactory and timely completion of the final examination, based on a written report that students have to prepare and post on Moodle according to pre-defined timetable.

### More information

<http://en.didattica.unipd.it/didattica/2014/AG0062/2008/002LE/AGN1030937/NO>

## CLINICS IN REPRODUCTION (CLINICAL MEDICINE)

5 years single-cycle degree in Veterinary Medicine  
Language: English  
Teaching period: first semester  
Lecturer: Stefano Romagnoli  
Credits: 9 CFU/ECTS  
Campus: Legnaro (PD)

8

### Prerequisites

Students are expected to have a sound understanding of anatomy and physiology of gonadal function as well as of physiology of the reproductive cycle of all domestic species as well as of exotic companion and wild animals. Having successfully passed the final exam of the course of Obstetrics and Pathology of Reproduction is a mandatory requirement.

### Programme

RUMINANTS Clinical exam of the reproductive tract. Heat detection. Artificial insemination. Vaginal and uterine prolapsed. Reproduction in buffaloes Reproduction in small ruminants. Pharmacologic manipulation of the reproductive cycle in seasonal and non-seasonal species. Clinical approach to the peripartum diseases. Reproductive health management programs. Assisted Reproductive Technologies  
HORSE Management of transition phase. Artificial insemination. Fertilization, early development and placental formation. Management of twin embryos. Embryonic death in mares. The prefoaling period. Parturition and dystocia. Retained placenta. Abortion due to infection, placentitis. Uterine cultures, cytology and biopsy. Biotechnologies in animal reproduction  
SMALL ANIMALS Pregnancy and pseudopregnancy. Parturition and pediatrics – puerperal diseases. The problem pregnancy. Infertility in the bitch and queen. Practical use of reproductive hormones. Vaginal prolapsed. Urinary incontinence. Mammary tumors. Neutering yes or no? And if yes, how and

when? Practical aspects of male reproduction. Cryptorchidism. Prostatic diseases in the dog. Reproduction in wild and exotic species.

#### **Examination**

Practical, written and oral examination at the end of the course.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/MV0991/2011/000ZZ/MVN1031791/N0>

## **ECONOMICS OF FOREST RESOURCES**

Second-cycle degree in Forest Science

Language: English

Teaching period: first semester

Lecturer: Paola Gatto

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

9

#### **Prerequisites**

Students must have a background in basic economics. The following concepts are particularly relevant: functioning of the market mechanism, reasons for market failure, theory of public goods.

#### **Programme**

The module comprises of four sub-modules 1. Introduction 2. Market and trade for timber products: characteristics and drivers Situation of forest resources and of timber products at the international scale; general features of timber markets and trade; barriers to trade; illegality in the timber trade 3. Forest dependence and livelihood: fuelwood and NWFPs Concepts of poverty and how to measure them; dependency of communities on forest resources; Value chain analyses for Wood and non-wood forest products 4. Forest services: Payments for Ecosystem Services (PES) and other Market-based tools Theoretical background from institutional economics: property rights theory/property regimes; PES basic concepts – PES typologies and examples; Designing and applying PES; PES case studies in the field of water, Carbon, biodiversity and recreation/amenity.

#### **Examination**

The final mark is made up of three components: class participation; individual project work; oral exam. Weight of the three components will be provided at the beginning of the lectures.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/001LE/AVP4061338/N0>

## ENVIRONMENTAL MINERALOGY

Second-cycle degree in Land and Environment Science and Technology

Language: English

Teaching period: second semester

Lecturer: Gilberto Artioli

Credits: 8 CFU/ECTS

Campus: Padova

10

### Prerequisites

Basic chemistry and chemical thermodynamics. Essentials of mineralogy and geology.

### Programme

Natural solid materials: basic concepts of mineralogy and crystal-chemistry. Natural processes. Introduction on the distribution of the chemical elements on the Earth's crust, on the geological processes, on the geochemical cycles. Processes and fluid-solid interactions at the mineral surfaces. Experimental techniques to study materials surfaces. Case studies:

- 1) Hazardous minerals in nature and in working places: asbestos, free silica. Environmental monitoring, assessment, mineral quantification, disposal.
- 2) Microporous minerals: clays, zeolites. Crystal structure, crystal chemistry, absorption properties, ionic exchange properties, catalysis. Their use in environmental, agricultural, and industrial applications.
- 3) Mineral dust. Origin, characterization. Implications for the palaeoclimatic and environmental reconstructions of the investigations of mineral dust entrapped in polar ice and ocean sediments.
- 4) Metals and the environment. Dispersion and re-mobilization of toxic elements during mineral deposits exploitation and industrial transformation of raw resources. Acid mine drainage. The case of arsenic dispersion: inorganic vs bio-controlled processes.
- 5) Binders and cements. Their use in history and in present societies as building materials. Environmental applications in solidification and

inertization processes of wastes and polluted soils.  
6) Rare Earth Elements. REE cycle and natural resources. Their role in technological products, recovery from e-waste.

### Examination

- 1) mid-term presentation on an analytical technique selected by the teacher. The student will summarize: (a) the fundamentals of the technique, (b) the instrumental configuration, (c) the resulting information, (d) describe one application with environmental implications.
- 2) The student will deliver a final presentation on a topic with environmental implications agreed with the teacher. The student will present: (a) the scientific problem, (b) the data available in the literature, with critical discussion, (c) the prospected actions for a better definition or solution of the problem.

### More information

<http://en.didattica.unipd.it/didattica/2014/IF0321/2008/001LE/AVP3054113/N0>

## FOREST PATHOLOGY AND WOOD ALTERATIONS

Second-cycle degree in Forest Science

Language: English

Teaching period: second semester

Lecturer: Lucio Montecchio

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

11

### Prerequisites

Plant biology, Forest botany, Silviculture.

### Programme

Role of parasites and mutualists in natural and artificial systems. Parasitism and parasitic relationships. Susceptibility and resistance. Epidemics.

### Examination

Written examination.

### More information

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/000ZZ/AGN1030840/NO>

## FOREST POLICIES AND GOVERNANCE: MANAGING CONFLICTS

Second-cycle degree in Forestry and Environmental Science

Language: English

Teaching period: first semester

Lecturer: Laura Secco

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

12

### Prerequisites

No pre-requirements requested.

### Programme

The course deepens the concept of forest policies and governance models intended to solve conflicts in link with deforestation, unsustainable management of forest, forest products and services production and trade. Central themes are: (i) forest policy and policy reforms at global, regional, national and local levels; (ii) the international dialogue on forests and certification systems: the opposite views and example of conflicts; (iii) different visions on new modes of governance; (iv) governance and 'good governance' concepts applied to forestry; (v) forest governance assessment initiatives; (vi) multi-actor, multi-sector and multi-level governance; (vii) governance and public participation in conflicting situations, negotiation procedures; (viii) sustainability, multifunctionality and cross-sectoral impact concepts as discussed for forest policy analysis; (ix) various examples (case-studies from tropical and mediterranean areas) related to: national forest policy formulation processes, forest certification initiatives, community-based forestry, forest-based rural development projects.

### Examination

The students are required to deal with 3 types of compulsory tasks during the course:

- 1) Oral presentation and discussion of slides (Power Point file) on selected scientific papers related to the course's topic.
- 2) Oral discussion of a written report (essay) about the issues developed during the course.

3) Final written examination with open-ended questions. Activities 1 and 2 will take place in the group. Activity 3 will be strictly individual.

**More information**

<http://en.didattica.unipd.it/didattica/2014/AG0062/2008/002LE/AGO2045189/N0>

## FOREST POLICY

Second-cycle degree in Forest Science

Language: English

Teaching period: first semester

Lecturer: Davide Pettenella

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

13

**Prerequisites**

No prerequisites are requested (attendance to the course Forest economics is advisable).

**Programme**

Contents of two modules:

1. general elements of the presentation of the processes of policy formulation, the instruments (command and control, voluntary, disclosure), actors (public institutions, companies and civil society actors) and their alliances and coalitions.
2. specific analysis of specific policies at international, European and EU level, for the forest sector and forest components of rural development policies, for the climate change, trade and energy

**Examination**

Written (4-5 open questions) and oral tests. To access to the oral test it is compulsory to pass the written one. The written exam is valid for 12 months.

**More information**

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/000ZZ/AGN1030676/N0>

## GLOBAL HISTORY OF FOOD

First-cycle degree in Science and Culture of Gastronomy and Catering

Language: English

Teaching period: second semester

Lecturer: Salvatore Ciriaco

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

14

### Prerequisites

Students must be able, through the general knowledge gained in previous years, to assimilate the contents of the history of food in a long-term perspective. They have yet to put this particular field of study in a broader framework that incorporated the general history, culture and economic development of much of the globe.

### Programme

Special attention will be given to the agronomical exchange between the Americas and Europe as consequence of the transatlantic links. The Asian tradition in the cultivation of many crops - rice in the first place - as well in the expansion of its kitchen will also be considered. Colonial produce as sugar, coffee, cacao will be analyzed as a fundamental chapter of the European "consumption revolution" during the Early Modern Times, opening a new era during which the expansion of the markets and the "globalization" of the taste characterized modern nutrition. The industrial preparation and conservation of food which started in the 19th century are today confronted with the discovery of the regional kitchen and new dimensions of food consumption (e.g. slow food).

### Examination

The examination will be addressed in oral form and at individual level, although the preparation of a term paper can be addressed and presented in aggregate form.

### More information

<http://en.didattica.unipd.it/didattica/2014/IF0365/2008/000ZZ/AVP3050149/N0>

## HUMAN RESOURCES MANAGEMENT

First-cycle degree in Science and Culture of Gastronomy and Catering

Language: English

Teaching period: second semester

Lecturer: Diego Campagnolo

Credits: 8 CFU/ECTS

Campus: Legnaro (PD)

15

### Prerequisites

Students are required to know the main principles of business economics.

### Programme

- Organization and Organizational Effectiveness
- Stakeholders, Managers, and Ethics
- Managing in a Changing Global Environment
- Basic Challenges of Organizational Design
- Designing Organizational Structure: Authority and Control
- Designing Organizational Structure: Specialization and Coordination
- Creating and Managing Organizational Culture
- Organizational Design and Strategy in a Changing Global Environment
- Organizational Design, Competences, and Technology
- Types and Forms of Organizational Change
- Human Resources Management and Human capital
- Motivation in work organizations
- HRM competency-based
- HR planning
- Job market and recruitment
- Selecting human resources: strategy, tools and targets
- Organizational needs and training
- Work analysis and job design
- Assessing human resources

### Examination

The final exam is a written exam. There will be some multi-choice questions (10 questions) and some open questions (5 questions).

Oral exam is up to the choice of each student

and is not mandatory (in addition to the written exam).

Students have also the opportunity to do a project work in team (in addition to the written exam).

The final exam is a written exam. There will be some multi-choice questions (10 questions) and some open questions (5 questions).

Oral exam is up to the choice of each student and is not mandatory (in addition to the written exam).

Students have also the opportunity to do a project work in team (in addition to the written exam).

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/IF0365/2008/000ZZ/AG01122561/N0>

## **INSECT ECOLOGY AND MANAGEMENT**

Second-cycle degree in Forest Science

Language: English

Teaching period: first semester

Lecturer: Andrea Battisti

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

16

#### **Prerequisites**

Basic knowledge of ecology and entomology.

#### **Programme**

Insect abundance and distribution: species-area relationships. Diversity of forest insects in relation to tree species, feeding guilds, and to the history of forest stands. Classification of the outbreaks and related examples. Population dynamics: demographic growth versus mortality. Population cycles in different types of forest ecosystems. Ecological factors affecting the populations of forest insects. Effects of climate and temperature, including climate change. Mechanisms of resistance developed by the host plants and adaptations of the insects. Role of competition and of natural enemies in population regulation. Principles of integrated pest managements based on the knowledge of the insect ecology. Prevention, direct and indirect control, economic assessment of costs and benefits of IPM in forestry. Relationships between climate change, range expansion and insect population dynamics. Invasive species in forestry: definitions, concepts, and applications.

#### **Examination**

The exam will consist of written reports on the laboratory/field activity done during the course as well as of an oral presentation on a subject agreed with the teacher.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/001LE/AVP4061258/N0>

## INTEGRATED WATERSHED MANAGEMENT

Second-cycle degree in Forest Science

Language: English

Teaching period: second semester

Lecturer: Paolo Tarolli

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

17

### Prerequisites

None.

### Programme

LECTURES 1. Introduction - Anthropocene - Discussion (seminar) 2. Climate change vs. land cover change - Climate change from the Pleistocene to the Anthropocene - Land cover change from the Pleistocene to the Anthropocene - Discussion (seminar) 3. Scale concept and remote sensing techniques - Scale - Digital Terrain Models - Remote sensing techniques - Discussion (seminar) 4. Natural Hazards (rainfall-runoff, landslide types and processes) - Rainfall-Runoff processes analysis and modelling - Landslide processes analysis and modelling - Discussion (seminar) 5. Hydrogeological Risk Assessment - Solutions - Future and strategic directions - Discussion (seminar) GIS LABORATORY Lab 1 - Introduction and usefulness of GIS platforms for hydrogeological risk assessment Lab 2 - Rainfall interpolation: analysis of a real event Lab 3 - Digital Terrain Analysis: DTM & topographic attributes Lab 4 - Land use change, and hydrograph change Lab 5 - Landslide hazard, and landslide risk.

### Examination

Drafting of a technical report that must include the main topics illustrated during the labs. Oral examination about the main theoretical concepts and the report as well.

### More information

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/003LE/AGN1030695/N0>

## INTRODUCTION TO GIS

Second-cycle degree in Forest Science

Language: English

Teaching period: first semester

Lecturer: Francesco Pirotti

Credits: 2 CFU/ECTS

Campus: Legnaro (PD)

18

### Prerequisites

- Math and geometry
- Basic knowledge of computer systems (Windows Operating System)
- A plus if student has used a software for data analysis (spreadsheet-like, or statistical packages such as R-cran)

### Programme

Introduction to computer systems and data processing software for analysis of natural resources. Basics of structuring of a geographic information system (GIS); basic introduction to concepts of surveying, mapping, and remote sensing as data sources; methods of data ETL (Extract Transform and Load) related to different data models (vector, raster and others); data processing and analysis including map overlay, buffer analysis, topographic modeling, spatial interpolation, and map design with GIS. Hands-on lab time using open-source relevant computer software packages.

### Examination

- Multiple choice exam at the end of course
- Evaluation of final GIS-based project report
- Evaluation of presentation to classroom of summary of article
- Multiple choice exam at the end of course
- Evaluation of final GIS-based project report
- Evaluation of presentation to classroom of summary of article.

### More information

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/000ZZ/AVP4060697/N0>



## ITALIAN FOOD, CUISINE AND DIETS

First-cycle degree in Science and Culture of Gastronomy and Catering

Language: English

Teaching period: first semester

Lecturer: Giovanni Bittante

Credits: 8 CFU/ECTS

Campus: Legnaro (PD)

19

### Prerequisites

To have attended to the first two years of the course.

### Programme

1st credit General – ecological – approach to feeding and nutrition.

2nd credit Historical evolution of relationships between agriculture, pastoralism and human nutrition.

3rd credit Seminars on culture of food and cuisine.

4th credit Meeting and seminars with entrepreneurs, managers and technicians from industries and their associations.

5th credit Traditional foods, Diets and Cuisines.

6th credit Practical activities and bibliographic search.

7th credit Technical visits.

8th credit Informational and training on stage and final evaluation.

### Examination

The evaluation will be based on the ability of the student to analyze and evaluate a complex problem relative to gastronomy and food service field.

### More information

<http://en.didattica.unipd.it/didattica/2014/IF0365/2008/000ZZ/AVP3050146/N0>

## LIVESTOCK BIODIVERSITY AND ANIMAL FOOD SAFETY

Second-cycle degree in Animal Science and Technology

Language: English

Teaching period: first semester

Lecturer: Martino Cassandro

Credits: 8 CFU/ECTS

Campus: Legnaro (PD)

20

### Prerequisites

Knowledge of: basic elements of Anatomy and physiology of animals in livestock production. Any preparatory lessons (recommended): organic chemistry, animal biology.

### Programme

1 ECTS: Animal Biodiversity

2 ECTS: Livestock Biodiversity

3 ECTS: Livestock species to bring into the Ark

4 ECTS: Strategies and conservation schemes

5 ECTS: Measures of genetic diversity and uniqueness

6 ECTS: Molecular markers

7 ECTS: Case studies

8 ECTS: Exercises and visits.

### Examination

Written, oral on request.

The exam will be in the english language.

### More information

<http://en.didattica.unipd.it/didattica/2014/AG0065/2008/000ZZ/AVP3050236/N0>

## MANAGEMENT AND TREATMENT IN MOUNTAIN AND MEDITERRANEAN FORESTS

Second-cycle degree in Forest Science

Language: English

Teaching period: second semester

Lecturer: Tommaso Sitzia

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

21

### Prerequisites

It is recommended that all students participating in the module possess prerequisite knowledge from the course of Silviculture in Mediterranean mountain forests.

### Programme

1. Ecological planning: fundamental concepts
2. Mediterranean forest ecosystem ecology and landscape ecology applied to forest management planning
3. Fundamentals of broad-scale ecological planning
4. Fundamentals of ecological planning of Mediterranean forest ecosystems
5. Levels of the planning instruments
6. State, regional and district forest management planning
7. Local forest management planning and forest working plans in the Mediterranean basin
8. Forest management planning in protected areas
9. Forest management planning in Natura 2000 sites with Mediterranean woodlands.

### Examination

Written exam.

### More information

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/003LE/AGO2045195/N0>

## MANAGEMENT OF MOUNTAIN FORESTS AND LOGGING SYSTEMS

Second-cycle degree in Forestry and Environmental Science

Language: English

Teaching period: first semester

Lecturer: Marco Carrer

Credits: 10 CFU/ECTS

Campus: Legnaro (PD)

22

### Prerequisites

Basic knowledge of ecology, forest botany and, especially, forest ecology.

### Programme

Over the last years, the quantitative definition of forest structure and stand dynamics has rapidly become more and more important because the knowledge of the main patterns and processes controlling a forest ecosystem is a critical prerequisite for a high-quality forest management. Therefore, an overall view starting from the ecological side of the ecosystem, to the management and finally to the exploitation strategies are becoming key instruments for a thorough knowledge and a wise management of forest systems. More specifically, the course includes: (i) Understanding the role of different forest types in view of choosing the right management system; (ii) Knowledge of key issues, instruments and methodologies of dendroecology; (iii) Knowledge of instruments and methodologies of spatial analyses related to forest dynamics; (iv) Assessment of the different forest functions and choice of the main one in the context of the landscape mosaic in subalpine environments; (v) Practical application of different silvicultural systems in subalpine forests. (vi) Knowledge of forest survey, mechanisation and logging in steep areas. (vii) Ability to analyse case-studies and to use them in understanding theory and concepts and in identifying weaknesses and strengths. In addition, most of the case-studies discussed are directly visited by the students; they are (a) an even-aged beech forest located in the pre-Alps; (b) a Pinus

sylvestris stand heavily disturbed; (c) a typical subalpine spruce stand; (d) a typical uneven-aged, mixed larch-stone pine high-elevation stand.

### **Examination**

The students will be required to prepare a written report on at least one of the three course modules. Field trips participation is essential. The report counts 1/3 of the final marking, while 2/3 is obtained through oral or written examinations on the whole programme of the course. Internal commission of examiners.

### **More information**

<http://en.didattica.unipd.it/didattica/2014/AG0062/2008/002LE/AVP3052631/N0>

## **MARKETING**

First-cycle degree in Science and Culture of Gastronomy and Catering

Language: English

Teaching period: first semester

Lecturer: Antonio Vianello

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

23

### **Prerequisites**

n.a.

### **Programme**

The most important objective in your business is to understand the wishes, identify and satisfy the right customers. This is the scope of marketing—a continuous process in which your ideas and analysis lead to actions and results, and controlling them you could generate further ideas and analysis. In the present era, in which competition is strenuous and demand is uncertain, a marketing orientation is vital to success: “differentiate or die”...

### **Examination**

Multiple choice test.

### **More information**

<http://en.didattica.unipd.it/didattica/2014/IF0365/2008/000ZZ/LE05105549/N0>

## MEAT SCIENCE AND TECHNOLOGY

Second-cycle degree in Animal Science and Technology

Language: English

Teaching period: first semester

Lecturer: Antonella Dalle Zotte

Credits: 8 CFU/ECTS

Campus: Legnaro (PD)

24

### Prerequisites

Animal feeding and nutrition, Animal breeding, Animal management.

### Programme

1st credit: Producing and eating meat. The mechanism of muscle contraction. Muscle fibre types. Muscle energy metabolism. Conversion of muscle to meat. 2nd credit: Factors that influence the post mortem variation and the resulting meat quality. 3rd credit: Variables that define the meat quality. Physical, chemical and sensory techniques for evaluating the meat quality. 4th credit: Properties of fresh meat. Nutritive value of the meat. 5th credit: Principles of meat processing. 6th credit: Processes and ingredients in manufacturing a variety of meat products. EU food quality certification and quality schemes-guaranteeing quality. 7th credit: General information on poultry breeds and hybrids, and productive systems used to obtain meat and meat products. Poultry meat products' processing and quality evaluation. 8th credit: Rabbit farming for meat production. Rabbit meat quality. The yield and nutritional value of meat from alternative species (ungulates, camelidae, rodents, ratites and reptiles).

### Examination

Written exam at the official exams timetable.

### More information

<http://en.didattica.unipd.it/didattica/2014/AG0065/2008/000ZZ/AVP3050239/N0>

## MOUNTAIN FLUVIAL MORPHOLOGY AND STREAM RESTORATION

Second-cycle degree in Forestry and Environmental Science

Language: English

Teaching period: first semester

Lecturer: Vincenzo D'Agostino

Credits: 8 CFU/ECTS

Campus: Legnaro (PD)

25

### Prerequisites

Basics on forest hydrology.

### Programme

4 ECTS taught by Prof. Mario A. Lenzi as follows: 1 ECTS - Different scales of analysis in river morphology. Landscape evolution. Tectonic and climatic effects. Forms due to geological changes: megafans, terraces, paleochannels. Drainage networks, orders of drainage systems, drainage density. Morphology of mountain basins. Colluvial and alluvial processes. Basics of freshwater ecology. Fundamentals of open-channel hydraulics. Continuity, Energy and Momentum equations. Flow resistance, velocity and discharge. Boundary shear stress. Grain size distribution of sediments. Incipient motion of sediments. Sediment transport capacity. Equilibrium concepts. Lane's balance (1 ECTS). Reach scale morphology. Bar and meander formation. Development of riffles, steps and pools. Role of boundary constraints. Influence of Large wood elements. Classifications by Leopold and Wolman, Montgomery and Buffington, Rosgen, Church (1 ECTS). Changes in reach morphology induced by human activities and their effects on river ecosystems. Principles of stream restoration. Reference conditions. Main restoration interventions and their sustainability (1 ECTS).

4 ECTS taught by Prof. Vincenzo D'Agostino as follows: Erosive forms in the landscape. Rill, interrill and gully erosion. The mechanisms of erosion and their linkages with catchment morphology and environmental conditions. 1 ECTS - The Universal Soil Loss Equation:

USLE. Use and applications (1 ECTS). Landslide classification. Infinite slope analysis. Erosion control on hilly and mountain slopes. Slope stabilization and bioengineering systems for shallow landslides. The root contribution. Use of geo-textiles. Terraces and drainage works. Exercises and applications (1 ECTS). 1 ECTS - Erosion control in open channel flows. River training works. The river-morphological approach for stream stabilization. Field trip (1 ECTS).

#### **Examination**

Oral examination, written examination, final report (4 ECTS, Prof. Lenzi).

Written exam with open questions plus a presentation and discussion of a technical report to the teacher (4 ECTS, Prof. D'Agostino).

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/AG0062/2008/002LE/AGO2045196/N0>

## RESEARCH PLANNING

Second-cycle degree in Forestry and Environmental Science

Language: English

Teaching period: first semester

Lecturer: Mara Thiene

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

26

#### **Prerequisites**

Principles of mathematics and statistics.

#### **Programme**

Topics covered in the course include:

- Descriptive statistics and visual display of information (1 ECTS)
- Basic probability theory (1 ECTS)
- Sampling distribution and statistical inference (1 ECTS)
- Simple and multiple linear regression (2 ECTS)
- Logistic regression (1 ECTS).

#### **Examination**

Written test.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/AG0062/2008/002LE/AGO2045199/N0>

## SILVICULTURAL SYSTEMS

Second-cycle degree in Forest Science

Language: English

Teaching period: first semester

Lecturer: Emanuele Lingua

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

27

### Prerequisites

Forest ecology, Botany.

### Programme

Introduction to Silviculture. Stand dynamics. Tending and intermediate cutting. Silviculture in even-aged stands. Silviculture in uneven-aged stands. The coppice system. Silvicultural management objectives.

### Examination

Oral exam.

### More information

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/001LE/AVP4061398/N0>

## SILVICULTURE IN MEDITERRANEAN MOUNTAIN FORESTS

Second-cycle degree in Forest Science

Language: English

Teaching period: first semester

Lecturer: Mario Pividori

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

28

### Prerequisites

Students must have knowledge on Forest Botany, Forest Ecology and Forest Measurements.

### Programme

In the first part of the course differences between traditional and Mediterranean mountain silviculture will be described focusing on environmental parameters, forest functions and silvicultural systems, including also human activities. In the second part case studies will be analyzed in different forest types of mountain forests present in Mediterranean areas and in different silvicultural systems so as coppice and high forest, mountain forest planting.

### Examination

Exam will be a written report of not more than 3000 words and oral exam with discussion about the topic of the report and the course experience.

### More information

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/003LE/AVP4061400/N0>

## SOCIAL RESPONSABILITY BY PUBLIC AND PRIVATE ORGANIZATIONS

Second-cycle degree in Forestry and Environmental Science

Language: English

Teaching period: first semester

Lecturer: Davide Matteo Pettenella

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

29

### Prerequisites

No one.

### Programme

After discussing some general concepts related to the responsible behaviour of private and public organisations, the course will present an overview of the tools implemented in the field of Corporate Social Responsibility and the main foundations and level of commitments in CSR in the forestry sector. Main contents of the course are the following ones:

- (i) Marketing development path, concepts and definition of CSR and government ethics in forestry (1 ECTS)
- (ii) Private, public and partnership tools to support CSR (3 ECTS)
- (iii) Foundations of CSR and different level of commitments in CSR (2 ECTS)

### Examination

Written text (open questions; one for each teaching module) and oral exam.

### More information

<http://en.didattica.unipd.it/didattica/2014/AG0062/2008/002LE/AGO2045205/N0>

## SOCIETAL MARKETING: FOREST CERTIFICATION AND OTHER TOOLS

Second-cycle degree in Forestry and Environmental Science

Language: English

Teaching period: first semester

Lecturer: Laura Secco

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

30

### Prerequisites

No special pre-requirements requested. However, it would be useful to temporarily follow or to have previously followed the course on “Social Responsibility by public and private organisations”.

### Programme

In the rapidly changing global scenario, in a market economy with competitive and transparent markets and environmentally conscious citizens and consumers, organisations are rewarded for their environmental and social achievements, while they face constraints if they use environmentally or socially poor practices without taking into account stakeholders’ point of views. Due to this trend, which is influencing the forestry sector’s producers, traders and users, the societal marketing is becoming a strategic instrument for business and public administration’s action.

The aim of the course is to give students a thorough understanding of the current situation and potential role of societal marketing applied to forestry sector. Particular attention is given to forest certification as an environmental and social-based marketing instrument.

1st ETCS: Fundamentals of Marketing, Societal marketing and strategic planning; the Marketing Mix: “4+2 P’s”; Market Segmentation and Differentiation; (iii) Introduction to the various instruments and initiatives for adopting and implementing environmental and social responsible behaviours, included legal and institutional tools such as the EU FLEGT.

2nd ETCS: (iv) Sustainable Forest Management standards (contents' analysis, system-based vs. performance-based, stakeholders consultation in standards setting processes; focus on the Forest Stewardship Council - FSC and the Programme for Endorsement of Forest Certification schemes - PEFC).

3rd and 4th ETCS: (v) Certification systems to be applied in forestry (definition of independent & accredited cert., comparative analysis of FSC and PEFC certification about governance; audit and certification procedures; accreditation; labelling rules; communication strategies).

5th ETCS: Special topics - certification of: Carbon offsets projects; Groups of forests/companies; Non-wood forest products; Fairtrade certification and other environmental and/or social certification schemes (ISO 14001).

6th ETCS: All the above mentioned topics further explored by the students (working groups) by means of class-room exercises, case-studies analysis, specialized advanced seminars by experts, plenary discussions in classroom, additional readings, field trip to a certified forest and a certified wood processing company in Veneto region.

### Examination

The students are first required to pass a written examination (open-ended questions on main contents of the course). Only those passing the written examination are admitted to the final oral examination. The oral examination includes: a) discussion on eventual weaknesses identified in the previous written examination; b) additional open-ended questions on the modules' contents. During the course, the students are required to prepare reports, PPT presentations and other documents as part of classrooms exercises and/or home assignments. Their active participation and quality of reports/documents presented are taken into consideration for final assessment of their performances.

### More information

<http://en.didattica.unipd.it/didattica/2014/AG0062/2008/002LE/AGO2045203/N0>

## SOIL AND WATER RESOURCES MANAGEMENT

Second-cycle degree in Forestry and Environmental Science

Language: English

Teaching period: second semester

Lecturer: Paolo Tarolli

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

31

### Prerequisites

Students are supposed to have a basic knowledge of math, physics, and trigonometry.

### Programme

#### LECTURES

1. Introduction - Major critical issues related to Soil and Water Resources Management in the Anthropocene era
  2. Principles of Hydraulics - SI units, properties of fluids - Pressure, forces on submerged surfaces - Continuity, energy and momentum equations and their applications - Kinematic of fluids, types of flows: open channel flow and flow under pressure, steady flows - Measurement instruments
  3. Principles of Hydrology - Water cycle - Rainfall - Soil hydraulic properties - Infiltration (Green-Ampt) - Surface and sub-surface water flow processes - Measurement instruments and hydrometeorological networks
  4. Soil erosion - Types of soil erosion - Impact of water soil erosion - Water soil erosion analysis and modelling
  5. Remote Sensing Technologies - Satellite, SAR, airborne LiDAR, Terrestrial Laser Scanners, SfM (Structure from Motion) - Effectiveness of high-resolution topography in different agricultural contexts
  6. Soil and Water Resources Management - Mitigation and control of land degradation (terraced landscapes, surface-water drainage systems) - Land use change effects on runoff processes - Sustainable soil and water resources management GIS
- LAB
1. Lab.1 - Introduction and usefulness of



GIS platforms for soil and water resources management

2. Lab.2 - Rainfall interpolation (analysis of a major event)
3. Lab.3 - Digital Terrain Analysis (DTM, topographic attributes, surface water flow directions)
4. Lab.4 - Soil erosion analysis
5. Lab.5 - Surface water storage capacity

#### **Examination**

The final exam consists in two sections:

- (1) numerical exercises. (2) discussion of a case study through a technical report.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/AG0063/2014/000ZZ/AVP4064951/N0>

## **VALUATION AND ASSESSMENT OF FOREST AND ENVIRONMENTAL GOODS AND SERVICES**

Second-cycle degree in Forest Science

Language: English

Teaching period: first semester

Lecturer: Mara Thiene

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

32

#### **Prerequisites**

Principles of mathematics and statistics.

#### **Programme**

Topics covered in the course include:

1. Principles of environmental economics, market failure, public goods, externalities and economic value of environmental resources
2. Environmental damages assessment
3. Revealed Preference methods: Travel Cost, Hedonic Pricing
4. Stated Preference methods: Contingent Valuation, Choice Experiments
5. Benefit Transfer

#### **Examination**

Written test.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/002LE/AGN1030815/N0>

## VEGETATION-ATMOSPHERE INTERACTIONS

Second-cycle degree in Land and Environment Science and Technology

Language: English

Teaching period: second semester

Lecturer: Andrea Pitacco

Credits: 8 CFU/ECTS

Campus: Legnaro (PD)

33

### Prerequisites

No specific prerequisites are strictly needed, but a basic knowledge of Calculus, General Physics, and Plant Physiology is requested, as given in most of graduate courses.

### Programme

1st Credit: Introduction to Biosphere-Geosphere Interactions; Basic concepts; Energy exchanges; Mass and momentum fluxes.

2nd Credit: Radiation; Basic laws; Radiation fluxes in the natural environment; Shortwave radiation; Longwave radiation; Net all-wave radiation; Radiation budget; Radiative properties of leaf canopies; Instruments and measurements.

3rd Credit: Energy balance; Soil thermal properties; Heat conduction in the soil; Soil temperature regime; Introduction to measurement techniques and data logging equipment; Practical setup of an environmental monitoring station.

4th Credit: Water and hygrometry; Thermodynamics of evaporation; Water vapour fluxes and transpiration; Fick's law and diffusion; Techniques for measuring leaf gas exchanges.

5th Credit: Wind; Laminar and turbulent flow; Statistical properties of turbulence; Navier-Stokes equation and turbulent transport; Momentum transfer; Logarithmic wind profile; Concept of boundary-layer at leaf and canopy scales; Aerodynamical properties of vegetation.

6th Credit: Introduction to the Eddy-Covariance technique; Heat and mass fluxes above vegetation; Sonic anemometry; Infra-Red gas analyzers.

7th Credit: Introduction to energy budget partitioning; Sensible and latent heat fluxes;

Bowen ratio; Flux-gradient relationships; Aerodynamical properties of canopies; Evapotranspiration and Penman-Monteith equation.

8th Credit: Integrated view of energy, water, and carbon fluxes; Carbon budget of vegetation canopies; Net ecosystem exchange; Carbon flux partitioning; Carbon sequestration and its role in mitigation of climate change; Mathematical modelling of plant canopies and Soil-Vegetation-Atmosphere-Transfer schemes.

### Examination

The examination will be based on: a) a mid-term presentation by the student on a key topic selected among a range of papers proposed by the teacher; b) the write-up of a technical report on the data collected during the practical work; c) a final oral colloquium.

### More information

<http://en.didattica.unipd.it/didattica/2014/IF0321/2008/002LE/AVP3054251/N0>

## VETERINARY GENERAL PATHOLOGY

5 years single-cycle degree in Veterinary Medicine

Language: English

Teaching period: second semester

Lecturer: Luca Aresu

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

34

### Prerequisites

The requested knowledge regards anatomy, histology and physiology.

### Programme

The endogenous causes of diseases: DNA and gene expression. DNA repair mechanisms. Mendelian (monogenic, polygenic and chromosomal) diseases. Phenotypic consequences of mutations. Disorders with multifactorial inheritance. Non-mendelian genetic disorders (mitochondrial DNA, genomic imprinting, triplet-repeat disease, gonadic mosaicism). Hexogen causes of diseases: Pathogenic mechanisms of ionizing and non-ionizing radiations. Thermal injuries (thermal burns, hyperthermia and heat stroke, hypothermia and freezing). Electrical injuries. Foreign bodies reactions. General principles of diseases caused by microorganisms (viruses, bacteria and parasites). Cell degeneration and necrosis: Acute and chronic inflammation: Tissue repair: Definition of tissue repair mechanisms. Control of normal cell proliferation. Stem-cell and differentiative tissue niches. Mechanisms of cell growth and differentiation: growth factors, their receptors and signal transduction pathways. Mechanisms of tissue regeneration: hepatic compensatory growth. Growth factors and the extracellular matrix. Angiogenesis. Mechanisms of wound healing (first and second intention). Tissue repair in specific tissues (bone, CNS) The pathology of tissue repair. Amyloidoses: Definition and criteria of amyloid identification. Classification criteria of amyloidoses. Mechanisms of amyloidoses. Morphologic features of amyloidoses in animals.

Veterinary General Oncology: Definition and general features of neoplasia. Epidemiology of human and animal neoplasias. Geographic and environmental factors associated with neoplasias. Genetic and non genetic predisposition to neoplasia. Benign and malignant neoplasias. Criteria for classification of animal neoplasias. Gross and histologic features of animals neoplasias. Cell kinetic factors. Biology of neoplastic growth. Molecular bases of neoplasia. Clonal origin and progression of neoplasia. Neoplastic progression. Essential molecular changes for neoplastic progression: self-sufficiency in growth signals (oncogenes), insensitivity to growth inhibitory signals (tumor suppressor genes), evasion of apoptosis, DNA repair defects and genomic instability, limitless replicative potential, sustained angiogenesis, invasion and metastasis. Pathways of metastatic spread. Gatekeepers and caretakers genes. Oncofetal antigens. Tumor immunity. Local and systemic effects of neoplasia. Paraneoplastic syndromes. Neoplastic cachexia. Acute tumor lyses syndrome. Grading and staging of tumors. Mechanisms in multidrug resistance. Carcinogenic agents. Chemical carcinogenesis: initiators and promoters. Mechanisms in viral oncogenesis. Hemodynamic disorders: Control of extracellular fluids and mechanisms of edema formation. Hyperemia and congestion. Hemorrhages. Haemostatic process. Pro-thrombotic and anti-thrombotic activity of endothelial cells. Platelets. The clotting system. Hemorrhagic disorders. The fibrinolytic system. Disseminated intravascular coagulation (DIC). Emboli and embolisms. Ischemia and infarctions. Shock. Immunopathology: Atopy and the main immunomediated allergic diseases. Reactions to non-microbial components. Hypersensitivity reactions

### Examination

Six written interim evaluations (10-15 MCQ) and final written examination (20 MCQ) and lab assessment at the end of each section with 5 MCQ and/or SAQ.

### More information

<http://en.didattica.unipd.it/didattica/2014/MV0991/2011/000ZZ/AVP3052609/N0>

## WILDFIRE AND NATURAL DISTURBANCE ECOLOGY AND MANAGEMENT

Second-cycle degree in Forest Science

Language: English

Teaching period: second semester

Lecturer: Emanuele Lingua

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

35

### Prerequisites

Forest Ecology, Forest Management, Silviculture.

### Programme

Disturbance ecology. Natural Disturbances: definitions, categories. Disturbance regimes. Disturbance analysis. Disturbances and biodiversity. Volcanoes, earthquakes. Landslides, rockfalls, avalanches, windthrows and snow breaks, gap dynamics. Forest fires. Fire Ecology. Forest fuels. Fire behavior. Firefighting. Fire management and planning. Post disturbance restoration.

### Examination

Oral exam.

### More information

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/003LE/AVP4060701/N0>

## WILDLIFE CONSERVATION AND MANAGEMENT

Second-cycle degree in Forest Science

Language: English

Teaching period: second semester

Lecturer: Maurizio Ramanzin

Credits: 6 CFU/ECTS

Campus: Legnaro (PD)

36

### Prerequisites

No prerequisites are requested.

### Programme

The course is organised in 6 sections:

1. introduction to wildlife conservation and management. The value of wildlife as a natural resource. Economic and social implications of wildlife conservation and management. Goals of wildlife management and management options. What do we conserve/manage? Concepts of species, evolutionarily significant unit, management unit and population: genetic approach, demographic approach, and geographic approach. Distribution, dispersal and metapopulation theories.
2. Population growth Rate of increase; geometric or exponential population growth; intra-specific competition and density-dependent population growth; the logistic model of population growth and its limitations, population stability and cycles. Age-specific population models. The concepts of sensitivity and elasticity.
3. Wildlife populations monitoring Counting animals: sampling, accuracy and precision of estimates, overview of the main principles and methods for large mammals and gamebirds. Principles, methods and associated problems in estimating sex ratio, age distribution, reproductive output, survival and mortality. Morphological and physiological measures of individual condition. Molecular genetic tools and approaches to population biology and monitoring.
4. Wildlife harvesting Concept of sustainable harvest. Effects of harvest on population dynamics and evolution: overharvesting, age and

sex biased harvest, the potential of harvest as a selective force, effects of hunting on behaviour. Setting harvest quotas: from a predictive towards an adaptive approach. Harvest as a source of information on population status/tendency.

Social, recreational, economic and conservation pros/cons of wildlife harvesting.

5. Inter-specific interactions and wildlife-habitat interactions. Types of interactions, competition and facilitation. Interactions between domestic animals and wildlife. The problem of alien and invasive species. Wildlife damages to agriculture and forestry. The growing problem of wildlife-vehicle accidents. Wildlife control: the concept of overabundance; ethics, principles and methods of control. Habitat loss and fragmentation; restoring connectivity, corridors and barriers. Habitat improvement/restoration: basic principles, the problem of spatial scale and economic feasibility.

6. Conservation of small and declining populations Genetic and demographic problems of small and isolated populations; effective population size; population viability analysis. Animal translocations. The role of Parks and natural reserves. Concept of ecological networks. Concepts of biodiversity hotspot. Gap analysis. International conservation: IUCN, CITES, The Natura 2000 network. The concepts of each section will be illustrated with reference to case studies. One field session will provide students with direct experience of some techniques used in population monitoring

#### **Examination**

The exam is oral.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/AV2091/2014/000ZZ/AGO2045209/N0>

## **WOOD HARVESTING AND TRANSPORTATION SYSTEMS**

Second-cycle degree in Forestry and Environmental Science

Language: English

Teaching Period: second semester

Lecturer: Raffaele Cavalli

Credits: 8 CFU/ECTS

Campus: Legnaro (PD)

37

#### **Prerequisites**

No one.

#### **Programme**

Forestry wood products; forestry wood supplying chains: forest work features; safety and health in forest work. Cutting operations: guiding principles and recommended practices in tree felling, trimming and crosscutting; risk assessment and protection of forestry workers. Ground-based extraction operations: guiding principles and recommended practices (extraction with chutes, extraction with ground-skidding, extraction with forwarder). Aerial extraction operations: guiding principles and recommended practices (extraction with cable systems; extraction with helicopter). Off-road transport: guiding principles and recommended practices (transport with trailer and forwarder). Material handling and on-road transportation: guiding principles and recommended practices (loading and unloading with crane and transport with truck).

#### **Examination**

The examination consists in a PowerPoint presentation of an intervention in a forest area chosen by the student. Main elements of the presentation are: description of the area and of the forest, definition of the wood product obtainable by the forest exploitation, analysis of the road network, identification of the forest exploitation system, performance of the forest exploitation system, analysis of the environmental impacts connected to the intervention. The presentation time is 20 minutes.

#### **More information**

<http://en.didattica.unipd.it/didattica/2014/AG0062/2008/002LE/AGO2045186/N0>



UNIVERSITÀ  
DEGLI STUDI  
DI PADOVA

[www.unipd.it](http://www.unipd.it)