SCUOLA DI SCIENZE AGRARIE, FORESTALI, ALIMENTARI ED AMBIENTALI

COURSE: **Construction and planning of forest systems**			
ACADEMIC YEAR: **2018-2019**			
TYPE OF EDUCATIONAL ACTIVITY: **Characteristic**			
TEACHER: **Prof. Pietro PICUNO**			
e-mail: **pietro.picuno@unibas.it**		web: **unibas.it/utenti/picuno/eng/index.htm**	
phone: **+39 0971 20.5437**		mobile (optional): **+39 329 3606235**	
Language: **Italian**			
ECTS: **n.4 ECTS lessons + n.2 ECTS training practice**	n. of hours: **n.32 hours lessons + n. 32 hours training practice**	Campus: **Potenza** - **SAFE School** Program: **Forestry and Environmental Science**	Semester: **1st**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course introduces into issues related to forestry construction and their relationship with the surrounding natural space and, in particular, with the territory, the environment and the forest landscape. At the end of the course, students will need to be able to properly report the acquired knowledge and apply them by solving simple problems - even numerical, where appropriate - or discussing elementary cases on issues related to forestry and its relationship with rural land.

The aim of the course is to provide the student with the skills related to the design and implementation of forestry buildings, as well as computer graphics and geomatics necessary for the survey and representation of buildings and the surrounding area as a basis for planning the forestry systems**.**

- **Knowledge and understanding**: knowledge and ability to understand the general principles of the different architectural and building solutions for forestry construction, plant typologies for microclimate control and main elements for the microclimatic control of the confined environment through the use of electronic devices, methods for surveying and representing the built system, tools for the analysis, planning and management of forest systems, with particular attention to ICT tools, such as the Geographical Information Systems - GIS.
- **Applying Knowledge and understanding**: Ability to apply the general principles of the different design choices about architectural and constructive solutions for forestry construction, to adopt the best plant design choices for microclimatic control and to correctly use electronic regulation devices in the confined environment, as well as tools for the analysis, planning and management of forest systems through the use of GIS.
- **Making judgements**: Ability to critically evaluate the different properties of materials used as building components as well as architectural solutions; ability to evaluate and apply the most suitable solutions for microclimate control; ability to identify the characteristics of each type of plant; identify and represent building relationships with the surrounding landscape as the basis for planning forestry systems.
- **Communication skills**: Ability to communicate the acquired information, organize them in a logical way, using a correct language, using relevant mathematical and graphical means where needed.
- **Learning skills**: ability to collect and organize information received during the lesson hours or on the recommended texts, available literature and within the *Web*.

PRE-REQUIREMENTS

The student has to be passed the following courses as a pre-requisite:

- Mathematics (concept of derivate and integral and their use for calculation);
- Physics (concepts from statics, thermo-dynamics and optics);
- Survey, drawing and GIS (topographical/GPS survey, Computer Aided Design e fundamentals about GIS).

SYLLABUS

Chapter 1: Design and implementation of a forestry building (16 hours of lesson)

Structural patterns: supporting wall and independent-frame structures. Structural building components: beams, columns, slabs. Foundations. Building materials: concrete, iron, wood, plastics. Construction techniques with

reinforced concrete. Finishes of buildings: walls, fixtures, equipment, floors and walls. Project preparation: report, drawings, administrative processing.

Chapter 2: Monitoring and climate control of an agricultural-forestry building (16 hours of lesson)

Heat transmission. Transmission by conduction, convection and radiation. Heating plants. Principles of psychrometry. The Mollier diagram. Ventilation and cooling systems. Gas and dust control.

Chapter 3: Principles of Cartography and Photogrammetry (16 hours of in Laboratory training practice)

Maps and representation scale. Perspective, cylindrical and conical projections. Mercator and Gauss Projections. Stereographic projection. IGMI (Italian Military Geographical Institute), cadastral and regional maps. Orthophotomaps. Photogrammetry, photo-interpretation, remote sensing. Stereoscopy. Terrestrial photogrammetry and aerial photogrammetry. Computer Aided Technical Design (CAD).

Chapter 4: Geographic Information Systems for planning forest systems (16 hours of in Laboratory training practice)

Principles and use of a Geographic Information System for planning the forest systems. Applications in planning and management of protected areas, energy systems, the agricultural-forest landscape, from agricultural production and *Smart Communities*.

TEACHING METHODS

The course includes n. 64 hours of teaching, divided into theoretical lessons (32 hours of lectures) and training practice (n.32 hours of guided exercises in the laboratory). More in detail, the course is organized in 16 hours of classes for each one of the first 2 chapters above reported, in addition to n. 16 hours of practical training and project in the laboratory of Survey, Drawing and GIS of the SAFE School, for each one of the remaining n.2 chapters.

EVALUATION METHODS

The final exam is aimed to ascertain the level of achievement of the knowledge and skills acquired by the student. It takes place in one session in the presence of the Board of Examiners. The examination is ordinarily conducted on the following phases:

a) Presentation by the student of his/her own annual project personally prepared (individually or in groups);

b) at the discretion of the Commission, some questions are asked on the four sections comprising the course.

c) a final general discussion about the use of advanced technologies for the analysis, planning and management of forest systems completes the examination.

The final vote is the average of the votes cast by each member of the Commission, unit-rounded. If there is unanimous judgment by the members of the Commission, a "*cum Laude*" acknowledgement may be allowed.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Textbooks (in Italian):

- R. Chiumenti. "*Costruzioni Rurali*". Edagricole, Bologna.
- A. Biasini, R. Galetto, P. Mussio, P. Rigamonti: "*La cartografia e i sistemi informativi per il governo del territorio*". Franco Angeli, Milano.
- N. Dainelli, F. Bonechi, M. Spagnolo, A. Canessa "*Cartografia numerica - Manuale pratico per l'utilizzo dei GIS*". Dario Flaccovio Editore.

INTERACTION WITH STUDENTS

At the beginning of the course, after describing the general objectives, program and methods of exam, the teacher informs the students about the recommended educational material and related retrieval mode. Simultaneously, it is collected a list of students who want to participate into the practical training exercises of the course, together with name, serial number and email.

Office hours: each Wednesday, from 9:30 to 11:30 am at the Professor's Office – SAFE School. In addition to this weekly reception, the teacher is available by appointment, to be fixed by direct contact with the student through e-mail or phone.

EXAMINATION SESSIONS (FORECAST)[1]

20/02/2019, 13/03/2019, 17/04/2019, 15/05/2019, 12/06/2019, 10/07/2019, 18/09/2019, 23/10/2019, 13/11/2019, 11/12/2019

EVALUATION BOARD

Prof. Pietro PICUNO, dr. Alfonso TORTORA, Ing. Dina STATUTO

[1] Subject to possible changes: check the web site of the Teacher or the Department/School for updates.

SCUOLA DI SCIENZE AGRARIE, FORESTALI, ALIMENTARI ED AMBIENTALI

SEMINARS BY EXTERNAL EXPERTS YES **X** NO □

FURTHER INFORMATION
Course Code: FAM/0514