COURSE: **PRINCIPLES OF DRYFARMING AND IRRIGATION MANAGEMENT**			
ACADEMIC YEAR: 2019-2020			
TYPE OF EDUCATIONAL ACTIVITY: Affine			
TEACHER: Stella LOVELLI			
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Language: Italian			
ECTS: 6 (5 CFU of lessons and 1 CFU of practice)	n. of hours: 40 (lessons) 16 (practice)	Campus: Potenza School: SAFE Program:	Semester: II semester

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course has as its objective the acquisition of theoretical and practical knowledge for the irrigation sector with particular reference to the environmental conditions of arid environments through the in-depth knowledge of cultivation techniques in dry and irrigated areas.

Knowledge and understanding: The student must demonstrate knowledge of the main cultivation techniques in a dry and irrigated regime and to understand and address the issues related to the proper management of irrigation techniques.

Applying knowledge and understanding: Students must demonstrate that they are able to make irrigation scheduling and perform preventive analysis of water and irrigation use in areas characterized by different crops.

Making judgements: The student must be able to know how to independently evaluate and select the most suitable tools for setting up correct strategies to ensure correct water supply to the crops.

Communication skills: The student must have the ability to explain, in a simple way how quantifying water and irrigation of agricultural crops. The student must be able to present a written work or oral presentation in the field of irrigation and dry farming using the correct scientific language.

Learning skills: Students must be able to continuously update and enrich their knowledge through consultation of texts and / or publications, computer tools, participation in courses and seminars on the basis of the knowledge gained during the course in the agronomy sector.

PRE-REQUIREMENTS

You must have acquired the following knowledge provided by the courses of "Agronomy", "Field crops" and "Horticulture".

SYLLABUS

CFU 1- (8 hours of lessons)

The training objective is the acquisition of theoretical and practical knowledge for the irrigation sector with particular reference to the following topics:

Water functions in crops; Water transport in the plant; Evapotranspiration (ET), Crop evapotranspiration and Reference ET; Quantification of atmospheric evaporative demand (VPD, Solar Radiation); control of the evaporation and transpiration flows; Leaf assimilation. CO_2 diffusion, (photosynthetic metabolisms C3, C4, CAM). Theoretical efficiency of the photosynthetic process and experimental measuring of leaf assimilation; gas exchange systems; leaf assimilation and variation in different radiation intensity conditions (curves A *vs* PFD) , concentration of CO_2 (curves A *vs* Ci) and temperature.

CFU 2 - (8 hours of lessons)

The training objective is the acquisition of theoretical and practical knowledge for the irrigation sector with particular reference to the following topics:

Measuring and estimating evapotranspiration (Penman-Monteith equation, evaporimeters, crop coefficients, micrometeorological methods). Water requirements of crops and methods of estimation. Crop coefficient (Kc). Yield coefficient (Ky). Hydrological characteristics of soils, water use and determination of available water for crops; water

use efficiency (WUE); assimilation, growth and production of crops in limiting water conditions; modeling of the production process in limiting water conditions.

CFU 3 - (8 hours of lessons)

The training objective is the acquisition of theoretical and practical knowledge for the irrigation sector with particular reference to the following topics: irrigation methods. (Submersion, Sprinkling, Drip irrigation, Sub-irrigation, ecc). Efficiency of the irrigation method, efficiency in the use of water and agricultural techniques to increase the efficiency. Water quality. Characterization of irrigation water quality. Waste waters. Irrigation of clay and saline soils.

CFU 4 - (8 hours of lessons)

The training objective is to agronomic dimensioning of irrigation systems that may include water solutions to micro-flow rate (drops and spray) and irrigation machines (Pivot, Rainger, for irrigation, etc.) which include the new LESA systems (Low Energy spray Application) and LEPA (Low Energy Precision Application).

CFU 5 - (8 hours of lessons)

The goal is the acquisition of theoretical and practical knowledge of dry farming with particular reference to the following topics: dry farming principles, cultivation techniques in arid environments, cropping systems of the arid areas. Actions to promote the accumulation of water reserves in the soil, actions to minimize water losses and maximize efficiency of water use.

CFU 6 - (16 hours of laboratory tutorials)

The training objective is to acquire data and information for the irrigation scheduling and management through active participation in exercises in the computer lab (use of irrigation scheduling software: CROPWAT, AQUACROP) and through numerical exercises.

TEACHING METHODS

The course includes 56 hours of teaching between Lessons and Laboratory tutorials. In particular it is provided 40 hours of lectures and 16 hours of guided exercises in the computer lab. At the end of the guided exercises, the students will have free access to the lab for further individual exercises.

EVALUATION METHODS

Learning will be verified during an oral examination at the end of the course. They will be drawn three questions, one of which will cover the knowledge and skills learned during the exercises.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

Ceccon P., AGRONOMIA*,* EdiSES, 2017

Mastrorilli M. L'ACQUA IN AGRICOLTURA. GESTIONE SOSTENIBILE DELLA PRATICA IRRIGUA. Edagricole, 2015.

Allen Richard G., Luis S. Pereira, Dirk Raes, Martin Smith. 1996. CROP EVAPOTRANSPIRATION -GUIDELINES FOR COMPUTING CROP WATER REQUIREMENTS - FAO Irrigation and drainage paper 56. FAO, Roma. ISBN 92-5-104219-5.

Goyal Megh R. 2016. PERFORMANCE EVALUATION OF MICRO IRRIGATION MANAGEMENT: PRINCIPLES AND PRACTICES. CRC-Press.

Teaching materials available on the website of the teacher : www2.unibas.it/lovelli/didattica

INTERACTION WITH STUDENTS

At the beginning of the course, after describing the objectives, program and methods of verification, the teacher provides students educational materials (giving a password to be able to download the course materials from the web site: www2.unibas.it/lovelli). Simultaneously, it collects a list of students who intend to take the course, together with name, serial number and email.

Office hours: Monday through Thursday from 10.00 to 13.00 at the study of the teacher (SAFE). In addition to weekly reception, the teacher is available at all times for a contact with the students, through their e-mail.

EXAMINATION SESSIONS (FORECAST)[1]
Consult the calendar available online https://unibas.esse3.cineca.it

SEMINARS BY EXTERNAL EXPERTS YES □X NO □

FURTHER INFORMATION
Examination committee: Lovelli Stella, Rivelli Anna Rita.

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