SCUOLA DI SCIENZE AGRARIE, FORESTALI, ALIMENTARI ED AMBIENTALI

ACADEMIC YEAR: **2019-2020**

COURSE **ORGANIC MEDITERRANEAN COMMODITIES PRODUCTION**

TYPE OF EDUCATIONAL ACTIVITY: Characterizing

TEACHER: Prof. Vincenzo Candido

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Language: Italian

ECTS: 12 (10 lectures + 2 practicals)	no. of hours: (80 h lectures + 32 h practicals)	Campus: Potenza School of Agriculture, Forest, Food and Environmental Sciences (SAFE) Program: MSc Food Science and Technology	Semester: II

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The module supplies knowledge on the cultivation, use and qualitative aspects of vegetables, both cultivated and wild ones, and aromatic and medicinal plants. Botanic identification and classification of vegetable, aromatic and medicinal plants and their suitability to be cultivated for high quality productions; main crop systems (organic, integrated and conventional farming, soilless cultivations); vegetable farm management and crop scheduling; cultivar choice; qualitative aspects of the seasonal and extra-seasonal vegetables; agronomic aspects of the production of 'minimally processed' and 'easy to eat' vegetables; microgreens; biofortified vegetables and biofortification techniques. To analyze the health traits of vegetable, aromatic and medicinal produces.

- **Knowledge and understanding**: Botanical and agronomic knowledges on the traditional vegetable, aromatic and medicinal productions in relation to the most representative crops; understanding the variation of the main produce characteristics in relation to the traditional genotypes/landraces utilized; knowledge on the bioactive compounds in the wild and cultivated vegetables and herbs; knowledge on grown methods and techniques able to increase nutraceutical products.
- **Making judgements**: Ability to propose solutions suitable to optimize the quality of productions and the nutraceutical value of vegetables, aromatic plants and herbs.
- **Communications skills**: Ability to communicate the impact of vegetable and medicinal plants on human health and the influence of cultural techniques and the genotype on the synthesis of bioactive compounds.
- **Learning skills**: Ability to access the statistical data sources (surfaces, productions and trade of the main vegetables and herbs) and to understand and summarize the data. Ability to document the factors influencing the quality of production and the synthesis of bioactive substances in vegetables, aromatic plants and herbs.

PRE-REQUIREMENTS

Basic knowledges concerning botany, agronomy and plant production science are required.

SYLLABUS

Lessons

The activities are divided in 12 blocks.

Block 1 (8 hrs, lectures)

The student will acquire theoretical and practical knowledges on vegetables by the participation at lessons and also by personal study. Topics to be developed are the following: origin and definition of vegetable crop science, classification criteria of vegetable species, main quality traits of vegetables. Nitrate accumulation in the edible parts of vegetables: effects on human health, legislative aspects, agronomic strategies for the nitrate reduction.

Blocks 2 (8 hrs, lectures)

Quality traits of vegetables in pre- and post-harvest: vegetable storage techniques. Main vegetable cultivation methods (organic, integrated an conventional systems; soilless culture); vegetable crop scheduling; cultivar choice; seasonal and extra-seasonal vegetable products. Influence of cultural practices and genotype on the synthesis of bioactive substances and enhancement of the corresponding high value nutraceutical products.

Block 3 (8 hrs, lectures)
Technical and scientific informations on the main vegetable crops for processing industry and for fresh market, with particular reference to those grown in Southern Italy: Solanaceae (processing and fresh market tomatoes, potato, pepper, eggplant).
Blocks 4 (8 hrs, lectures)
Description of other vegetable species in continuation of the previous block: Brassicaceae (cabbage, broccoli, cauliflower, savoy cabbage, kale, broccoli raab, turnip, radish, minor species).
Block 5 (8 hrs, lectures)
Description of other vegetable species in continuation of the previous block: Asteraceae (artichoke, chicory, lettuce, endive and escarole, minor species), Cucurbitaceae (melon, pumpkin and zucchini, cucumber, minor species).
Block 6 (8 hrs, lectures): Description of other vegetable species in continuation of the previous block: Alliaceae (garlic, onion and shallot, asparagus, minor species), Apiaceae (fennel, carrot, celery, parsley).
Block 7 (8 hrs, lectures)
Description of other vegetable species in continuation of the previous block: Chenopodiaceae (chard and red beet, spinach), Leguminosae ('borlotto' bean, snap bean, green peas for fresh market and for processing).
Block 8 (8 hrs, lectures)
'Minimally processed' and 'easy to eat' vegetables; microgreens; biofortified vegetables and biofortification techniques.
Block 9 and 10 (8 hrs, lectures)
Aromatic and medicinal plants: definition, classification, economic and marketing importance, cultivation (integrated and organing farming), "balsamic time" and harvesting, processing, extraction of active compounds and/or essential oils. Aromatic and officinal plants belonging to the following botanical families will be sudied: Apiaceae (sweet fennel, wild fennel, dill, anise, coriander), Labiatae (mint, rosemary, sage, thyme, basil, oregano), Iridaceae (saffron), Asteraceae (echinacea, dandelion).
Blocks 11 and 12 (32 hrs, practices)
Laboratory and farm practices will be conducted in order to give to the students knowledges on classification of the main vegetables, aromatic and medicinal plants and the related cultivation techniques.

TEACHING METHODS
Lectures (80 hrs), laboratory and farm practices (32 hrs).

EVALUATION METHODS
Oral exam, consisting of questions based on theoretical knowledges and laboratory practices. To pass the exam the students have to achieve at least 18 points on 30.

LECTURE MATERIAL ON-LINE
- Notes from lessons.
All the lecture material selected by the teacher will be made available to students in electronic format (pdf).
IN-DEPTH TEXTBOOKS
- Baudoin W., Nono-Womdim R., Lutaladio N., Hodder A., Castilla N., Leonardi C., De Pascale S., Qaryouti M., 2013. Good Agricultural Practices for greenhouse vegetable crops: Principles for Mediterranean climate areas, FAO Plant Production and Protection Paper n. 217, FAO-UN, Rome.
Pardossi A., Prosdocimi Gianquinto G., Santamaria P., Incrocci L. (a cura di), 2018. Orticoltura: Principi e pratica, Edagricole, Bologna, 2018.
- Marzi V. De Mastro G., 2008. PIANTE OFFICINALI. Coltivazione, trattamenti di post-raccolta, contenuti in principi attivi, impieghi in vari settori industriali ed erboristici. Adda Ed. Bari. 472 pp.

INTERACTION WITH STUDENTS
During the first lesson, after describing the aims, contents and exam procedures, it will be collected the list of students attending the course enclosed their registration number and e-mail. During the lessons, teaching materials will be provided. Students may contact the teacher anytime by mobile phone or e-mail for any clarifications or to set an appointment in his office at SAFE, I floor. The teacher will meet the students on Tuesday, Wednesday and Thursday, from 10.00 to 13.30.

EXAMINATION SESSIONS (TENTATIVE)[1]
14/7/2020, 09/9/2020, 14/10/2020, 11/11/2020, 15/12/2020, 12/1/2021, 10/2/2021, 16/3/2021.

EVALUATION COMITTEE
Prof. Vincenzo Candido (President), Prof.ssa Stella Lovelli (Member), Dr. Donato Castronuovo (Replacement member), Prof. Michele Perniola (Replacement member), Prof.ssa Mariana Amato (Replacement member).

SEMINARS BY EXTERNAL EXPERTS YES □ NO X

FURTHER INFORMATION

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