SCUOLA DI SCIENZE AGRARIE, FORESTALI, ALIMENTARI ED AMBIENTALI

COURSE: Food Traceability	
ACADEMIC YEAR: 2018 / 2019	
TYPE OF EDUCATIONAL ACTIVITY: Free choice	
TEACHER: Prof.ssa Gioia Tania	
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Language: Italian	

ECTS: 6 (5 lessons e 1 tutorials/practice)	n. of hours: 56 (40 lessons e 16 tutorials/practice)	Campus:Potenza School: Scuola di Scienze Agrarie, Forestali, Alimentari ed Ambientali - SAFE Program: Food Technology/	Semester:

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The main objective of the course is to provide students with the knowledge of the main genetic and molecular methodologies in the field of food traceability.

Knowledge and understanding: Knowledge of genetic and molecular methodologies for controlling the quality of food. Knowledge of genetic transformation methodologies for qualitative and quantitative detection of genetically modified organisms. Knowledge of methodologies for the identification and certification of raw materials and derived food products.

Applying knowledge and understanding: Ability to integrate the acquired genetic and molecular knowledge for the production, protection and quality of food products. Ability to develop strategies for the identification of raw materials and processed food products. Ability to use software for processing data obtained from genetic and molecular analysis.

Communication skills: Ability to communicate with a technically and scientifically correct language. Ability to interact and communicate with food business operators. Ability to communicate clearly to non-technical audiences.

Learning Skills: Ability to access bibliographic sources and computer tools to integrate and deepen knowledge in the field food tracability.

PRE-REQUIREMENTS

Students are advised to have a good knowledge of the courses attended in the previous trimester

SYLLABUS

1 ECTS (8 h, lectures)

Overview on genetic resources, their conservation and importance for agriculture and food production.

2 ECTS (8 h, lectures)

Genomics and molecular methods; Organization and structure of the genome; Unique and repeated sequences. Transposable elements; Genetic maps and physical maps; Allocation of loci to specific chromosomes; Locating genes and molecular markers on genetic maps; High resolution chromosome maps; Comparative analysis of genomes; Use of genetic maps in the analysis of Mendelian and quantitative characters; Identification of QTL.

3 ECTS (8 h, lectures)

Markers in Genome Analysis; Biochemical markers; Molecular markers; Molecular markers based on restriction techniques; Molecular markers based on amplification techniques; SSR markers; AFLP markers; SNP markers. Genetic

4 ECTS (8 h, lectures)

Traceability of Foods; Traceability and traceability in the main agri-food chains; Typical products (DOP, DOC, IGP, IGT); Application of advanced molecular methodologies for traceability of raw materials and derived foods. Extraction of genomic DNA from food. Quantitative and qualitative methods based on PCR; Advanced molecular and bioinformatics genetics: sequencing and bioinformatics methods as a traceability tool; Integration and expression of exogenous genes in transgenic organisms; Qualitative and quantitative methods to detect GMOs. Identification and quantification of GMOs in foods.

5 ECTS (8 h, lectures)

Omics technologies (transcriptomics, metabolomics and proteomics) for the analysis of seeds, plants and derivatives; Data analysis through statistical methods and models and interpretation of results.

6 ECTS (16 h, practicals)

Case studies of genetic traceability in food products. Analysis of specific DNA sequences for food safety and quality. Genomic and metabolomic analysis in the main agro-food chains (cereals, oil, wine, meat, fish products, etc. …). Use of computer tools to analyze and study genetic traceability in the agri-food industry.

TEACHING METHODS

The course includes 64 hours of teaching between lessons and tutorials/practice. In particular, they are divided into 48 hours of frontal lectures and 16 hours of tutorials/practice in the laboratory tutorials and in the computer lab. The topics of the course will be treated with the help of multimedia equipment. During the tutorials/practice hours students actively participate in laboratory experiments that aim to provide the basic genetic tools useful in the agro-food sector.

EVALUATION METHODS

Learning will be assessed, in the first part of the course, through periodical discussion of the theoretical concepts and, subsequently, with an oral examination at the end of the course organized in at least three questions by which the student must demonstrate knowledge of the theory and to be able to connect each other for a lesson topics Verifying the learning of teaching is to find the level of achievement of the previously mentioned educational goals and is through an oral examination. To pass the test students must acquire at least 18 points out of 30.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Food Authentication Using Bioorganic Molecules. Editore Stefano Sforza, Ph.D., University of Parma
- BARCACCIA G., FALCINELLI M. Genetica e genomica, Volumi III, Liguori Editore.
- Lecturer's note of the course and PDF files, reprints, etc.
- Scientific articles provided by the teacher during the course.

INTERACTION WITH STUDENTS

At the beginning of the course, after describing the objectives, program and test procedures, teacher collects the list of students accompanied by name and email.

The teacher receives generally on Monday and Friday from 9.00 to 11.00 in the teacher's room (SAFE 4thfloor-3A412room, Viale dell'Ateneo Lucano, Potenza) and she is available at all times for a contact with the students, through its e-mail, telephone, Skype, or Whatsapp.

EXAMINATION SESSIONS (TENTATIVE)[1]

21/12/2018, 11/01/2013, 01/02/2019, 01/03/2019, 05/04/2019, 10/05/2019, 07/06/2019, 05/07/2019, 06/09/2019, 04/10/2019, 08/11/2019, 13/12/2019.

SEMINARS BY EXTERNAL EXPERTS YES X NO □

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

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FURTHER INFORMATION

Professor Tania Gioia (President commission), Professor Giuseppina Logozzo (member), Professor Pierluigi Spagnoletti Zeuli (substitute)