



Centre adscrit



UNIVERSITAT DE
BARCELONA

COURSE CONTENT

Academic year 2020/2021

Code-Course	052213- Genetic evolution and crop improvement for culinary products.		
Thematic Area	Origin of culinary products	Year	Second
Course Type	Mandatory	Credits	3 cr. ECTS
In-class Hours	30 hours	Hours of Individual Work	45 hours

BRIEF COURSE DESCRIPTION

The foods we eat are the result of agriculture and/or animal husbandry. The livestock and crops in farms are descendants from wild organisms but they have changed a lot for the last 10.000 years of interaction with us.

This course will examine the genetic changes produced in primitive cultivated organisms from wild organisms, and the ones produced from the first domesticated animals to date. Students will learn about the modifications that affect the sensory value of foods and the meaning of genetics terminology which have become a concern because of the lack of awareness of what they mean (hybrids, genetic improvement, transgenic foods, etc).

It is also important to understand the role that genes and environment play in the formation of raw materials (phenotype) as well as the weight of cultural factors and objective information in science when innovating in raw materials. Nowadays, we can have products on demand and cooks should know the potential of today's technology to produce new products for them to use in their dishes.

GENERAL SKILLS

GS8 – Build hypothesis, collect and interpret information according to the scientific method.

SPECIFIC SKILLS

SS9 – Recognize and apply the main basic operations of the industrial processes in order to guarantee the control of the processes and products intended for human consumption.

SS10 – Identify the geographical origin of the products and the influence of local factors in their distribution.

LEARNING OBJECTIVES

- Use the genetic history of crops to make decisions in the choice of products.
- Differentiate between genetic and environmental effects in the characteristics of a product.
- Differentiate between cultural components and scientific knowledge in the valuation of products.



THEMATIC CONTENTS

1. Conditions prior to agriculture and animal husbandry. Knowledge about the hunter-gatherer communities with regard to farming and livestock.
2. The origin of agriculture and animal husbandry. Difference between growing crops and domesticating animals.
3. Animal domestication. Places and species.
4. The origins of agriculture in our country. Places and remains of the Upper Palaeolithic.
5. From domestication to scientific genetic improvement: traditional varieties and races.
6. **What is genetics? What's the purpose of genetic improvement?**
7. The molecular basis of heredity. DNA.
8. Clones
9. Pure lineages.
10. Hybrids.
11. Synthetic varieties.
12. Recombinant DNA technology and transgenic organisms.
13. Distinguish the genetic and environmental effects in the characteristics of a product. Experimental methods.
14. Sensory value genes> cases and future implementations.

LEARNING METHODOLOGY

This course combines lectures, discussions and practical classes where students will experiment with the main differences of wild, domesticated and genetically improved materials. Students will be able to do the final examination with their notes so they can reflect on the topics seen in class.

ASSESSMENT SYSTEM

The **assessment system assesses the student's achievement of learning outcomes regarding the subject's own competences.**

Students may choose between continuous assessments throughout the year or a final examination at the end of the course.

Continuous assessment: the teaching-learning process is assessed by a continuous monitoring of the work done by the students throughout the course.



Final examination: it assesses the students' learning outcomes by means of a final exam at the end of the course. Students who cannot come to class regularly due to justified reasons will be assessed at the end of the course.

Assessment systems	Continuous	Final
Student assignments	40 %	40%
Final written exam	60%	60%

REVIEW AND REASSESSMENT OF THE COURSE

The student has the right to review all the evidences that have been designed for the assessment of learning.

If a student fails to achieve the learning objectives of the course, in order to opt for the reassessment of the course and submit a new reassessment task, it will be mandatory to fulfil one of these conditions:

- A. Students must have been awarded a mean grade of 5.0 or higher in relation to the activities carried out throughout the semester without taking into account the final exam/s (both continuous assessment and single assessment) and having attended the final exam.
- B. Students must have been awarded a final minimum grade of 4.0 in the overall course.

After the reassessment, the maximum grade is 5.0 in the overall course.

BIBLIOGRAPHY

- Cubero J.I. (2003). Introducción a la Mejora Genética Vegetal. (2ª Ed.) Ed. Mundiprensa.
- Hancock. J.F. (2004). Plant evolution and the origin of Crop Species. New Jersey Prentice Hall cop.
- Harlan J.R. (Ed.) (1992). Crops & Man. Second Edition. Published by the Crop Science Society of America and American Society of Agronomy.
- Doré, Claire, and Fabrice Varoquaux (2006) Histoire et amélioration de cinquante plantes cultivées. Editions Quae, 2006.
- Allard, Robert W. (1960) Principles of plant breeding. John Wiley & Sons, 1999.
- Simó J., Plans M., Casañas F. (2010) La agrobiodiversidad: historia natural y econòmica. FES-UIMP-FMA, Barcelona (accés: <http://fundaciomiquelagusti.com/wp-content/uploads/2010/11/Agrobiodiversitat-I.pdf>)