

COURSE: Machinery and Equipment for dairy production

ACADEMIC YEAR: 2016/2017

TYPE OF EDUCATIONAL ACTIVITY: Elective

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Language: Italian

ECTS: 6 (lessons e tutorials/practice)

n. of hours: 56 (40+16)
(lessons e tutorials/practice)

Campus: Potenza/Matera
Dept./School: School of agriculture, forestry, food and environmental sciences
Program:

Semester: II

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The course of Machinery and Equipment for dairy production aims to deepen the technical aspects related to dairy production. Therefore, as part of the course will cover topics related to the design, construction and operation of all machinery and plants present in the modern dairy industry, with reference both to small and medium-large size dairy companies. The lectures, supplemented with seminars by industry experts, are accompanied by practical exercises held in the laboratory of pilot plants for dairy processing, where experimental tests of cheese production will be carried out, with active participation of students. The goal is to provide students with the knowledge of the basic elements for the selection and sizing of the machines and equipment used for the execution of unit operations performed during the production of cheese and other dairy products, and knowledge about the start and the use of machines in a MINI-DAIRY plant.

The main knowledge provided are:

- Design criteria of a dairy
- Layout analysis of the machines in the production process
- Dimensioning and selection of components and machines
- Machines and plants for the production of fermented milk Installations and for the recovery and processing of the whey
- Facilities for salting, ripening and packaging of dairy products

The following main skills will be achieved:

- to define the basic elements of each machine / plant and the production plant layout with reference to the most important dairy production on the local and national market with regard to the qualitative impact on the food product
- Ability to start, conduct and use optimally installations present in a MINI-DAIRY for the production of pasta filata cheese products and derivatives, and be able to recover and eventually transform the dairy industry
- To develop expertise on the possibilities of disposal and / or recovery of the dairy industry.

PRE-REQUIREMENTS

A good knowledge of "Machinery and Equipment for the food industry" and "Unit Operations of the food industry" is need.

SYLLABUS

Introduction (4h)

Introductory remarks on the dairy industry systems and the needs of the industry The materials used in the dairy, the role of stainless steel, receipt and storage of milk machines

Standardization of the milk and heat exchange (8h)

Homogenizers and deaerators Bactofughe and Centrifuges pasteurization and sterilization of milk plants Evaporation

plant and concentration

Production of pasta filata cheeses and other products (14h + 10h lab)

Equipment for the production of mozzarella

Equipment for the production of cheese

Equipment for the production of yogurt

Introduction to Plant for the production of cottage cheese, butter, ice cream

Equipment for the production of soluble powders and freeze-dried milk

The recovery of the dairy industry by-products (2h + Lab 4h)

tangential filtration equipment (ultrafiltration and reverse osmosis)

Principles of operation of a line for the recovery of the whey proteins

Principles of operation of a line for the recovery of lactose

Automation and measurement in the dairy (4h + 2h Lab)

Principles of automation and control in the dairy

Measurement of the rheological properties of milk, cheese and other derivatives

Dairy design (8h)

Design of dairy spaces and outdoor areas

Service facilities (water, electricity, compressed air, steam)

Design examples of a dairy plant and mini-dairy plant

Processing cost estimate and business plan

TEACHING METHODS

The course includes 56 hours of teaching between theoretical lessons and “on plant” experimentation. In particular it is provided 40 hours of lessons in the classroom and 16 hours in the laboratory of pilot plants for dairy processing .

There will be seminars held by experts, for n. 6 hours.

EVALUATION METHODS

The aim of the examination is to test the level of achievement of the previously mentioned educational goals. At the end of the course the final exam will be done. The exam consists of an oral discussion of a paper prepared by the candidates on a topic, previously agreed with the teacher, among the topics of the program. The time available for the oral discussion of the paper is 25 minutes. The test is passed with a minimum score of 18/30 .

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

The reference material consists of notes selected by reference texts and provided to students, supplemented with educational materials produced by the teacher. All course material is regularly provided to students by sharing in a Dropbox folder reserved for the students present in class who include their e- mail address.

INTERACTION WITH STUDENTS

At the beginning of the course, after describing the objectives, program and methods of verification, the list of students who intend to assiduously attend the course and participate in the laboratory demonstrations will be collected. The teacher provides the students the course material at the end of each lesson through shared folders to which students have access. In addition to weekly reception, the teacher is available at all times for a contact with the students, both at his office and by mail.

Office hours: Tuesdays from 15.30 to 17.00 and Wednesday from 15.30 to 17.30 office is situated on the 4th floor ex DITEC Dept. (3A sud building - Campus Macchia Romana)



**SCUOLA DI SCIENZE
AGRARIE, FORESTALI,
ALIMENTARI
ED AMBIENTALI**

EXAMINATION SESSIONS (FORECAST)¹

12/07/2017, 20/09/2017, 18/10/2017, 22/11/2017, 13/11/2017.

EVALUATION BOARD

dott. F. Genovese (Presidente), Prof. G.C. Di Renzo (componente), prof. G. Altieri (supplente)

SEMINARS BY EXTERNAL EXPERTS YES ● NO □

FURTHER INFORMATION

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