

Course Unit	Oenological Engineering	Field of study	Food Industries
Bachelor in	Oenology	School	School of Agriculture
Academic Year	2023/2024	Year of study	2
Type	Semestral	Semester	2
Workload (hours)	162	Contact hours	T 30 TP - PL 30 TC - S - E - OT 4 O -
Level	1-2	ECTS credits	6.0
Code	9998-705-2202-00-23		

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) José Carlos Batista Couto Barbosa, Luís Manuel Cunha Santos

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. To understand fundamental concepts of engineering; steady state energy and mass balances; heat transfer and fluid-flow
2. To understand legislation and procedures for licensing wineries and winemaking facilities
3. Understanding plans and layout from wineries and winemaking facilities
4. To identify and understanding required conditions to winery layout plans
5. To identify and understanding features and functions about machinery and equipment in wineries and winemaking facilities
6. To identify and understanding requisites and conditions to consider when planning, building and keeping wineries and winemaking facilities

### Prerequisites

Before the course unit the learner is expected to be able to:  
Basic knowledge of Physics and Engineering

### Course contents

Fundamentals of Engineering. Building and location for wineries and other facilities. Planning layout design of wineries and winemaking facilities. Machinery and equipment. Construction and maintenance of the wineries facilities. . Climatization and environmental control. Practical works in order to plan and dimensione viticulture and winery activities

### Course contents (extended version)

1. Introduction
  - Lessons. Documentation and bibliography. Examination
  - Purpose and objectives of this course.
2. Fundamentals of Engineering
  - Energy and mass balance
  - Heat and fluids transfer
  - Project and plan components
3. Building and location for wineries and other facilities
  - Legislation and procedures for licensing wineries and other related activities
  - Plan components required for licensing wineries and technical requisites
  - The site and local conditions for building winery
4. Planning layout design of wineries and winemaking facilities
  - Phases in order to prepare and carry out building project
  - Flow diagrams
  - Processing operations and methods
  - Winery: Planning and layout design
  - Main aspects to consider about dimensioning and building of winery facilities
5. Machinery and equipment
  - Machines for harvesting and convey grapes
  - Reception equipment and control systems
  - Processing equipment
  - Winemaking equipment
  - Wine storage stuff
  - Warehouse and packaging equipment
  - Other equipment and systems (cooling system, handling and transport)
6. Construction and maintenance of the wineries facilities.
  - Machines installation and equipment
  - Water supply and energy
  - Access way and outside facilities
  - Maintenance: cleaning and safety in wineries
7. Climatization and environmental control
  - Indoor environmental conditions
  - Importance and effects of environmental conditions
  - Thermal control and buildings insulation
  - The importance of building / winery orientation
  - Ventilation
  - Heating
  - Cooling and refrigeration
  - Lighting
8. Practical works in order to plan and dimensione viticulture and winery activities

### Recommended reading

1. Cardoso, António Dias (2019) O vinho - da uva à garrafa, 2ª edição. Quântica Editora - Conteúdos Especializados, Porto
2. Gabarrón, Antonio M. (2011), Análisis y desarrollo de proyectos en la ingeniería alimentaria. Editorial Club Universitario, Alicante.
3. Madrid Vicente, A. (2013), Nuevo manual de industrias alimentarias. AMV Ediciones, Madrid.
4. Nardin, G. ; Gaudio, A. ; Antonel, G. ; Simeoni, P. (2006) Impiantistica enologica. Ciclo tecnologico di vinificazione e progettazione degli impianti. Edagricole, Bologna.
5. Vanaclocha, A. Casp (2005). Diseño de industrias agroalimentarias. Ed. Mundi-Prensa, Madrid.

### Teaching and learning methods

Lecture about course contents and task-related training. Working classes in order to carry out tasks to calculate areas and quipment to provide the winery.

**Teaching and learning methods**

Developing tasks to search technical information in order to choose machinery and equipment to the winery.

**Assessment methods**

1. Alternative 1: Continuous Assessment - (Regular, Student Worker) (Final)
  - Practical Work - 40%
  - Final Written Exam - 60%
2. Alternative 2: Final Evaluation - (Regular, Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100% (Includes practical examination)

**Language of instruction**

Portuguese, with additional English support for foreign students.

**Electronic validation**

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16-01-2024	22-01-2024	27-01-2024	28-01-2024