

Academic Year/course: 2021/22

## 30820 - Food Technology I

### Syllabus Information

**Academic Year:** 2021/22

**Subject:** 30820 - Food Technology I

**Faculty / School:** 105 - Facultad de Veterinaria

**Degree:** 568 - Degree in Food Science and Technology

**ECTS:** 6.0

**Year:** 3

**Semester:** First semester

**Subject Type:** Compulsory

**Module:**

### 1. General information

### 2. Learning goals

### 3. Assessment (1st and 2nd call)

### 4. Methodology, learning tasks, syllabus and resources

#### 4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. The course is structured in 36 lectures, 1 hour; 8 hours of practice sessions, organized in work sessions of two hours; 16 hours of laboratory practices, organized into 4-hour sessions; and performing, presentation and defense of a report on one of the practices, randomly chosen by the teacher.

In relation to the lectures, it is scheduled to deliver the documentation for each item prior to their development, so that the student review it in detail before the corresponding session. In principle 40-50 minutes will be devoted to the exhibition of the most important and / or difficult aspects, and 10-20 minutes to answer questions and practical issues relating to the subject matter; depending on the subject under study.

Classroom practice sessions will be organized in 2 hours and students will solve them different practical cases, which are intended to achieve the learning outcome 4. They were raised and discussed issues related to the calculation, optimization and adjustment of various treatments.

Practices are held in sessions of 4 hours. The conservation-related heat must be conducted on consecutive days. It is envisaged that each session the group to split into three subgroups 3-4 students, who will perform three different activities simultaneously. Except in the specific case of dedicated to thermal treatments, each group will practice a week, once received the corresponding theoretical classes.

Students must follow the regulations described in:

- Prevention: A guide for students at the University of Zaragoza:  
[https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/guia\\_preventiva\\_para\\_estudiantes.pdf](https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/guia_preventiva_para_estudiantes.pdf)
- Manual de seguridad en los laboratorios de la Universidad de Zaragoza y normas marcadas por la Unidad de Prevención de Riesgos Laborales:

[https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/manual\\_de\\_seguridad\\_en\\_los\\_laboratorios\\_de\\_la](https://uprl.unizar.es/sites/uprl.unizar.es/files/archivos/Procedimientos/manual_de_seguridad_en_los_laboratorios_de_la)

<https://uprl.unizar.es/inicio/manual-de-procedimientos>

In addition, students will follow as well any instructions related to biosecurity given by the professor

## 4.2. Learning tasks

The course includes the following learning tasks:

- Lectures: 36 sessions, 1 hour each.
- Practice sessions: 8 hours of practices sessions, organized in work sessions of two hours; 16 hours of laboratory practices, organized into 4-hour sessions.
- Assessment tasks: performing, presentation and defense of a report on one of the practices.

## 4.3. Syllabus

The course will address the following topics:

BLOCK I. General principles. Teaching and learning activities: (0.7 ECTS)

- lectures: 7 hours contents:
- Theoretical teaching: Introduction. Parameters food quality. Altering agents food. food risks and technological solutions. Strategies food preservation. predictive modeling.
- Practical teaching: predictive modeling. Growth models and inactivation. primary, secondary and tertiary models.
- Practices Laboratory: 2 hours, included in the analysis of data from other practices.

BLOCK II: Processed food by heat and irradiation. contents:

- Theoretical teaching: Introduction and historical perspective. Biological Effects of Heat inactivation kinetics. Effects on quality: optimization of treatments. Calculation and adjustment of the heat treatments.
- Teaching practice: Conserving heat. RTD data acquisition and the effects of heat on quality. Met. multipoint. RTD data collection. Met. the endpoint. Construction of graphs of survival, thermal destruction and TDT. Calculation of  $D_t$  and  $z$  values. Development of predictive models.
- Teaching and learning activities: (3.0 ECTS)
- master-classes: 14 hours
- Practices in class: 8 hours
- Laboratory practices: 8 hours (includes development of predictive models).

BLOCK III: Processing of food by cold and modified atmospheres Contents:

- Theoretical teaching: Introduction and historical perspective. Fundamentals of conservation in refrigeration. Fundamentals of storage / packaging in special atmospheres. Fundamentals of freeze conservation.
- Practical teaching: Conservation by lowering the temperature. Elaboration freezing curves and estimation of the parameters of interest. Colligative properties and their effect on freezing. Effect of freezing conditions on the quality of a food. Effect of temperature on enzymatic and / or microbial activity.
- Teaching-learning activities: (0,8 ECTS)
- Master Classes: 4 hours
- Laboratory practices: 4 hours

BLOCK IV: Fundamentals of food processing by reduction of water activity. Contents:

- Theoretical teaching: Introduction and historical perspective. Interaction of water with other food components:  $A_w$ . Sorption isotherm. Hysteresis. Biological effects of the decline in water activity. Adaptation to hyperosmoticity. Effects of declining water activity on quality.
- Practical teaching: Food conservation by control of  $a_w$ . Determination of the water activity by a method of graphical interpolation and by determination of the dew point. Determination of water activity by isopiestic methods. Elaboration and analysis of a sorption isotherm.
- Teaching-learning activities: (1 ECTS)
- Master Classes: 6 hours
- Laboratory practices: 4 hours

BLOCK V: Other technologies.

- Theoretical teaching: Fundamentals of acidification of food. Fundamentals of chemical food preservation. Fundamentals of new food processing technologies. Fundamentals of food preservation by combined processes.
- Teaching-learning activities: (0,5 ECTS)
- Master Classes: 5 hours

## 4.4. Course planning and calendar

The dates and key milestones of the subject are described in detail, along with those of the other subjects of third year in the Degree of Science and Technology of Food, in the Web page of the Faculty of Veterinary Medicine (link:<http://Veterinary.unizar.es/gradocta/>). This link will be updated at the beginning of each academic year.

#### **4.5. Bibliography and recommended resources**

Normally, the bibliography of the current academic year is kept up-to-date and consulted on the Library website (search recommended bibliography at [biblioteca.unizar.es](http://biblioteca.unizar.es))