

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
Food Technology	Basics of Food Technology	3º	1º	6	Compulsory
LECTURER(S)			Postal address, telephone nº, e-mail address		
• María del Carmen Almécija Rodríguez			Dpto. Ingeniería Química, 2ª planta, Facultad de Ciencias. Despacho nº 20. mcalmeci@ugr.es http://sl.ugr.es/mcalmeci		
DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT					
Degree in Food Science and Technology					
PREREQUISITES and/or RECOMMENDATIONS (if necessary)					
Students should have passed the following subjects: Basics of Food Engineering and Unit Operations in the Food Industry.					
BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE ¿??)					
Thermal processing. Low temperature technology for preservation. Freezing. Preservation by dehydration. Packaging.					
GENERAL AND PARTICULAR ABILITIES					
OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)					
<ul style="list-style-type: none"> ○ Select variables of heat treatment necessary for microbial thermal inactivation. ○ Identify alternative sterilization technologies such as irradiation, high-pressure processing and pulsed electric field processing ○ Calculate refrigeration systems, including mechanical refrigeration cycle. 					



- Design preservation systems by reducing the water activity such as drying, freeze-drying and evaporation.
- Describe materials and types of packaging suitable for various foods.

DETAILED SUBJECT SYLLABUS

THEORETICAL TOPICS:

1. Thermal processing

Kinetics of microbial inactivation. Heat processing methods: pasteurization, blanching and sterilization.

2. Low temperature technologies for preservation

Irradiation. High-pressure processing. Pulsed electric field.

3. Freezing

Low temperature production: mechanical refrigeration cycle, enthalpy diagram, refrigerants. Refrigeration: heat transfer under unsteady state, calculations of common terms used in refrigeration system design. Freezing: freezing curve, freezing kinetics.

4. Dehydration

Psychrometry. Water activity. Drying: in heated air, by direct contact with a heated surface, equipments. Freeze-drying: time, equipments. Evaporation: single-effect, multiple-effects, equipments.

5. Packaging

Materials used for packaging foods. Aseptic packaging. Vacuum packaging. Modified atmosphere packaging. Active packaging. Intelligent packaging.

PRACTICES:

Laboratory Practices

READING

- Rodríguez F. y cols. Ingeniería de la Industria Alimentaria. Vol. III. Operaciones de conservación de alimentos. Ed. Síntesis, 2002.
- Ordóñez J.A. y cols. Tecnología de los Alimentos. Vol I. Componentes de los alimentos y procesos. Ed. Síntesis, 1998.
- Ibarz A. y Barbosa-Canovas G. Unit Operations in Food Engineering. Ed. CRC, 2002.
- Brenan J.G. y cols. Food Processsing Handbook. Ed. Wiley, 2006.

RECOMMENDED INTERNET LINKS

