

Course:	L025 - Food Quality and Nutrition
Degree:	Bachelor
Curriculum Unit:	9025003 - Molecules and Macromolecules in Food
Scientific field:	Chemical Sciences
ECTS^(*):	5
Curriculum year:	1st
Curriculum semester:	2nd
Frequency Regime:	Mandatory
Teacher(s):	Dulcineia Maria de Sousa Ferreira Wessel
Contact hours ^(**):	T - 30; P - 30
Total work time (hours):	132

(*) - ECTS - European Credit Transfer and Accumulation System

(**) – T- Theoretical; TP- Theoretical/Practical; LP- Lab Practice; S- Seminars; I- Internships; TU - Tutorials; O- Other (Evaluations)

Objectives / Competences

- To acquire a basic knowledge of the physico-chemical properties and reactions of organic molecules classes.
- To obtain a broad vision of the potential of a scientific language in describing food systems.
- To develop the ability to relate the structures, physico-chemical and biological properties of (macro) molecules with their functions and reaction behavior.
- To relate the structure and properties of food and its transformations with the knowledge acquired at a (macro)molecular level.
- To understand the interaction between properties of the (macro) molecular components and functional behaviour of food and ingredients.

Syllabus

Fundamentals of organic chemistry - bonding and structure; formulas; functional groups; properties; types of reactions.

Macromolecules food components such as polysaccharides, proteins and lipids - structural features; chemical and functional properties; reactions during processing; applications in industry and small food production. Minor components constituting food such as enzymes, phenolic compounds and compounds responsible for the color - structure, chemical and bio-activity behavior. Interactions between food components. Reactions leading to food spoilage. Performance of components (macro) molecular in functional foods.

Teaching methodologies and evaluation criteria

- Theoretical component:

Lectures are descriptive with audiovisual resources (examples associated with the transformation of foods). Literature searching, written elaboration, presentation and discussion of group work making use of forums and other tools available in electronic e-learning platform.

- Theoretical and practical component:

Research on analytical techniques associated with raw materials and / or food and / or ingredients. Experimental design and implementation of activities related to functional properties of macromolecular components, chemical and sensory changes during food processing.

- Evaluation system:

Evaluation of group work performed within the theoretical and theoretical-practical components with relative percentage definition of each component to be discussed with the students; Group presentation on PPT format and oral discussion. Written test to evaluate the individual knowledge.

Short bibliography

Belitz, H.D., Grosch, W., Schieberle, P., Food chemistry. Springer, 2004.

Coulter, T., Food: The chemistry of its components, Royal Society of Chemistry, 2009.

Fennema, O. R., Química de los Alimentos, 2ª Ed. Editorial Agribia SA, 2000.

Hoefler, A. C., Hydrocolloids: Practical Guides for the Food Industry, Amer Ass. of Cereal Chemists, 2004.

Tsai, C. S., Biomacromolecules: Introduction to Structure, Function and Informatics, Wiley, 2007.