FOOD ANALYSIS

Degree in Human Nutrition and Dietetics (2026 - 2027)

Code: 803982
Modulus 2
Subject: Food Science
Type of subject: Compulsory
Course: Second
Semester: Check calendar
Department: Nutrition and Food Science (Food Science Teaching Unit)
Credits: 6 ECTS

LECTURES

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BRIEF DESCRIPTION

This course has the purpose of making students aware of the importance of food quality analysis and control.

In it, the importance of sampling and treatment of the sample in food analysis will be studied, as well as the quality in the analytical laboratory and the analysis methods for the study of food nutrients.

In addition, the study of the main physical-chemical and sensory analyses used in the quality control of the different food groups will be studied in depth, in order to establish their nutritional value and quality, and in the detection of possible fraud and adulterations.

SKILLS

They are those corresponding to the Module and Subject to which this type of subject belongs.

General skills

- G.C.1.1.
- G.C.1.2.
- G.C.1.3.
- G.C.1.4.
- G.C.2.1
- G.C.2.2
- G.C.2.3
- G.C.3.1.
- G.C.3.3.
- G.C.3.4.
- G.C.4.1.
- G.C.4.2.
- G.C.4.3.
- G.C.5.3.
- G.C.5.4.
- G.C.6.1.
- G.C.6.2.
- G.C.7.3.
- G.C.7.4.
- G.C.8.1.

Specific skills

- S.C.M1.1
- S.C.M1.5
- S.C.M1.6
- S.C.M1.7
- S.C.M2.1
- S.C.M2.2
- S.C.M2.4
- S.C.M2.5
- S.C.M2.6
- S.C.M3.3
- S.C.M3.4
- S.C.M3.6
- S.C.M3.7
- S.C.M3.8
- S.C.M4.01
- S.C.M4.02
- S.C.M4.04
- S.C.M4.17
- S.C.M4.19
- S.C.M4.22

OBJETIVES

The general objective is the acquisition by the students of the basic skills and knowledge, both theoretical and practical, of the methods that constitute the Chemical and Sensory Analysis of food.
The specific objectives are focused on the study of:
• The fundamentals of chemical and sensory analysis of food.
• Food analysis, interpretation of results and preparation of technical reports.
• Sampling and sample taking.
• The basic principles of the quality of analysis laboratories and the Standards that regulate it.
• The main methods of analysis of food components.

• The most representative parameters of quality control of all food groups.
• Evaluation of experimental results
• The characteristic sensory properties of food.
• The different types of sensory tests.
• The Rules and/or Regulations by which the quality criteria of food are established.

TOPICS

Topic 1. Importance of food analysis. Types of analysis. Bibliography and organisms of reference in food analysis.
Topic 2. Definition of food quality and associated concepts. Quality control in the food industry. Role of official organisms in food control. Quality assurance in food analysis laboratories: ISO 17025 standard.
Topic 3. Sample and sampling. Basic sampling requirements. Sampling types. Sampling and sample preparation
Topic 4. Laboratory materials. Water in food analysis laboratories. Analytical reagents and its preparation. Reference materials.
Topic 5. Analytical methods. Types of analytical methods. Evaluation of the methods. Expression of results: units and calculation methods.
Topic 6. Analysis of food components. Determination of water content: physical methods. Chemical methods. instrumental methods.
Topic 7. Analysis of carbohydrates. Classification. Analysis of available carbohydrates. Chemical, enzymatic and chromatographic methods. Analytical methods to determine dietary fiber.
Topic 8. Analysis of lipids. Quantitative determination of fat. Preparative extraction of fat. Physico chemical properties of fats.
Topic 9. Protein analysis. Qualitative and quantitative analysis. Kjeldahl method. Colorimetric methods.
Topic 10. Determination of mineral content. Methods of destruction of organic matter. Instrumental analysis of mineral elements. Other methods.
Topic 11. Importance of sensory analysis: sensory descriptors. Quality control in the laboratory. Good sensory analysis practices. Materials of reference. Legislation. Standardization.
Topic 12. Sensory evaluation. Analytical methods. Types of tests. Taste documentation. Evaluation of the methods. Results expression.
Topic 13. Panel of tasters. Training and monitoring. Food applications.
Topic 14. Consumer studies. Food applications.
Topic 15. Analytical determinations for quality control of milk and dairy products.
Topic 16. Analytical determinations for quality control of meat and meat derivatives.
Topic 17. Analytical determinations for quality control of fish and shellfish: fresh and preserved products.

Topic 18. Analytical determinations for quality control of edible oils and fats. Investigation of oil mixtures.

Topic 19. Analytical determinations for flour quality control. Quality control of cereal derivatives.

Topic 20. Analytical determinations for quality control of fruit and vegetable products.

Topic 21. Analytical parameters of potability of water. Quality control of bottled waters. Quality parameters of non-alcoholic beverages.

Topic 22. Quality parameters of alcoholic beverages. Quality control of wine and alcoholic beverages.

TEACHING METHODOLOGY

Lectures: will introduce the student to the fundamental theoretical contents of the subject using computer tools. To facilitate the follow-up work by the students, teaching material will be provided on the Virtual Campus.

Seminars: resolution of practical cases related to the food analysis laboratory: preparation of solutions, expression of concentration, and application of analytical techniques in solving problems related to chemical and sensory quality control of food.

Laboratory practices: application at an experimental level of the knowledge acquired, through the handling of material, means and laboratory equipment, and analytical determinations of various quality parameters of different food groups (fats, meat derivatives, milk and derivatives, cereals, drinks...).

The completion of practices is mandatory on the dates and times assigned in the teaching calendar and taught by at least two teachers.

Tutorials: guidance and resolution of doubts.

The Virtual Campus will be used to allow fluid communication between teachers and students, and as an instrument to make available to students the necessary teaching material to facilitate the student learning.

EVALUATION CRITERIA

• The evaluation of the competences acquired in the practical laboratory and in the seminars, will be carried out through a final exam of each one of the activities.

• The theoretical contents will be evaluated through a final exam.

To pass any of these exams, it will be necessary to obtain a minimum score of 5 out of 10.

The student's final grade will take into account the grades obtained in the theory exams (60%), seminars (25%) and practices (15%), being an essential requirement that each of the activities has been approved.

Both identity theft and fraudulent copying, action or activity during an exam will lead to failure of the subject in the corresponding call. The use or presence of notes, textbooks, calculators, mobile phones or other means that have not been expressly authorized by the teacher in the exam statement will be considered as a fraudulent activity. In any of these circumstances, the infraction may be the subject of the corresponding information file and, where appropriate, sanctioned by the UCM Services Inspectorate.

REFERENCES

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Approved by Department Board, on April 29th, 2026