

MODULE	SUBJECT MATTER	YEAR	SEMESTER	CREDITS	TYPE
Food Science	Food analysis and Food science	2º	2º	6	Obligatory course
TEACHING STAFF ⁽¹⁾			ADDRESS, TELEPHONE NUMBER, EMAIL, ETC. DIRECCIÓN COMPLETA DE CONTACTO PARA TUTORÍAS (Dirección postal, teléfono, correo electrónico, etc.)		
<ul style="list-style-type: none"> • Dr. JESÚS LOZANO SÁNCHEZ Part I • Dra. CELIA MONTEAGUDO SÁNCHEZ Part II 			Dpto. Nutrición y Bromatología, 3ª planta, Facultad de Farmacia. Correo electrónico: jesusls@ugr.es , celiams@ugr.es		
			TIMETABLE FOR TUTORIALS OR LINK TO WEBSITE		
			Jesús Lozano Sánchez https://directorio.ugr.es/static/PersonalUGR/*/show/5da2bd9a7d2d2ee5417a817451fd484c Celia Monteagudo Sánchez https://directorio.ugr.es/static/PersonalUGR/*/show/c3cd334b56d5e0309a89c685f44bf014		
BELONGS TO UNDERGRADUATE DEGREE PROGRAMME			AND ALSO TO OTHER UNDERGRADUATE DEGREE PROGRAMMES		
<i>Grado</i> in Food Science and Technology and Doble Grado in Food Science and Technology/Human Nutrition and Dietetics			Human Nutrition and Dietetics		
PREREQUISITES OR RECOMMENDATIONS (where applicable)					
In particular this course requires previously successful completion of all the materials previously for the Common Basic Training module, and the subjects: Chemical Analysis, Commodity Production, Food Chemistry and Biochemistry and Food Science I and II.					
BRIEF DESCRIPTION OF CONTENT (ACCORDING TO OFFICIAL VALIDATION REPORT)					

¹ Consult any updates in Acceso Identificado > Aplicaciones > Ordenación Docente

(∞) This course guide should be filled in according to UGR regulations on assessment of student learning: (<http://secretariageneral.ugr.es/pages/normativa/fichasugr/ngc7121/>!)



- The food analysis: purposes, procedures. Types of analysis. Quality of analytical results.
- Methodologies for quantification of the different nutrients of a food product, to evaluate other quality specifications and food quality control, detection of tampering, adulteration and fraud
- Sensory analysis of foods.

GENERAL AND SPECIFIC COMPETENCES

General Competences

The Basic Skills of University contained in the Agreement of the Andalusian Committee of the Degree in Science and Food Technology

Transversal Competences

Ability to use ICTs with ease

Specific Competences

Ability to correct handling of samples during sampling and preparation for analysis of different types of food.

To develop common and the most frequently analytical protocols used to detect alterations in food, adulteration and fraud.

To acquire fluency in the use of official methods of analysis used in food.

To understand the foundations and objectives of the sensory analysis.

To understand its importance as a parameter of quality food and drinks.

To analyze your interest in research, development and innovation of new foods.

To study the standard conditions for the training of the panel and to perform the tests.

To learn the most commonly used sensory testing.

To initiate students on tests of sensory analysis.

Ability to participate in sensory analysis tests.

Use knowledge gained about the chemical composition and properties of food, food analysis, detection of fraud and its alterations, processing, preservation and evaluation of the quality of food.

Conduct Chemical analyzes, interpret results and write reports, take responsibility for issuing opinions related to the overall quality of the food samples.

OBJECTIVES (EXPRESSED AS EXPECTED LEARNING OUTCOMES)

- The knowledge needed to analyze food, raw materials, ingredients, additives, etc., assess results and, where appropriate, propose actions for improvement.

DETAILED SYLLABUS

THEORY:

- 1.- Introduction to Food Analysis. Overview. Food Law. Official controls.
- 2.- Determination of Water and dry. Problematic. Methods for drying. Methods by distillation. Chemical and physical methods. Measure of water activity. Applications.
- 3.- Determination of Protein and nitrogen compounds. Total nitrogen and nonprotein nitrogen. Applications. Amino acid composition. Determining the quality of the protein.
- 4. - Determination of Lipids. Extractable fat. Total fat. Fatty acid composition. Isolation and analytical study of the unsaponifiable. Physical and chemical indexes. Applications.
- 5. - Determination of Carbohydrate. Carbohydrates total usable. Starch and reducing sugars. Applications.
- 6. - Determination of fiber. Overview. Methods of analysis. Total fiber, insoluble and soluble. Applications.



- 7. - Determination of ash: Importance. General method. Types of ash. Applications.
- 8.- Determination of mineral elements: Importance. Sample preparation. Element analysis of interest. Applications.
- 9. - Determination of Vitamins. Extraction and separation. Most common methods used in their determination.
- 10. - Additives: Standards of identity and purity. Methods of analysis. Determination food
- 11. - Quality control of protein foods. Quality parameters. Alteration, adulteration and fraud more common. Methods of analysis.
- 12. - Quality control of edible oils and fats. Standards and analytical methods.
- 13. - Quality control of hydrocarbon food. Quality parameters. Methods of analysis
- 14. - Spices and condiments. General Methods. Specific methods. Composition of authentic spices. Determining the geographic origin of a kind. Food stimulants. Quality control.
- 15. - Canned and semi preserved Foods. Packaging, Labeling and factors relating to storage.
- 16. - Water. Soft drinks and alcoholic beverages. Quality parameters.
- 17. - Sensory attributes. Appearance or aspect. Importance of color. Odor and flavor: properties and sensory evaluation
- 18. - Consumer Panel. Features. Composition. Objectives. Affective sensory tests. Utility. Statistical treatment. Interpretation of results. Analytical Panel. Features. Composition. Objectives. Selection process, training and monitoring. Basic conditions of operation. Normalized vocabulary.
- 19. - Sensory discriminative tests. Classification. Objectives. Paired comparison test. Triangle test. Duo-trio test. Multiple comparisons. Other. Applications. Statistical analysis and interpretation of results.
- 20. - Descriptive sensory tests. Classification. Objectives. Sensory profiles. Flavor profile. Texture profile. Advanced Techniques. Applications. Statistical analysis and interpretation of results. Measurement scales.
- 21. - Organoleptic assessment of virgin olive oil. Regulations. Objective. Sensory attributes. Methodology. Profile sheet. Statistical treatment of data and interpretation of results.
- 22. - Wine tasting. Factors affecting the sensory quality of wine. Influence of process and aging. Sensory attributes. Vocabulary and methodology. Tasting notes.

PRACTICE:

Seminars/Workshops

- Design of Standard Operating Procedures
- Use of Reference Materials
- Reporting

Laboratory work

- Practice 1. - Performing preference sensory analysis: paired comparison test. Discriminative tests: duo-trio test and triangular test
- Practice 2. Organoleptic assessment of virgin olive oil: different sensory attributes and profile sheets
- Practice 3. - Wine tasting: sensory attributes and profile sheet
- Practice 4. - Determination of essential elements and pollutants by atomic absorption spectroscopy
- Practice 5. - Detection and determination of food additives
- Practice 6. - Determination of caffeine and quinine in soft drinks
- Practice 7. - Determination of reducing sugars and acidity in honey

BIBLIOGRAPHY

BASIC BIBLIOGRAPHY

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Zaragoza, España.

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- Alvarado, J. de Dios, Aguilera, J.M. (Eds.). 2001. Métodos para medir propiedades físicas en Industrias de Alimentos. Ed. Acribia, S.A. Zaragoza, España.
- AOAC 1993. Methods of Analysis for nutrition labeling. Eds. Sullivan, D.M.; Carpenter, D.E., Arlington, VA, USA.
- AOAC 2005. Official Methods of Analysis of the Association of Official Analytical Chemists, 18th ed. 4ª rev. 2011. Association of Official Analytical Chemists. Gaithersburg, Maryland, USA.
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- Instituto Nacional de Consumo. 1999. Métodos Analíticos del Laboratorio del Instituto Nacional del Consumo (CICC). Alimentos I. Ed. Ministerio de Sanidad y Consumo, Madrid, España.
- Jackson R.S. 2008. Wine Science: principles and applications. Ed. Elsevier. San Diego, USA.
- Matissek, R.; Schnepel, F.M.; Steiner, G. 1998. Análisis de los alimentos. Fundamentos, métodos, aplicaciones. Ed. Acribia, S.A. Zaragoza, España.
- Ministerio de Agricultura, Pesca y Alimentación (MAPA). 1998. Métodos Oficiales de Análisis en la Unión Europea. Madrid.
- Nielsen, S.S., Boff, J.M., Bradley, R.L., Bridges, A.R., BeMiller, J.M. 2008. Análisis de los alimentos. Ed. Acribia, S.A. Zaragoza, España.
- Roudot, A-C. 2004. Reología y Análisis de la Textura de los Alimentos. Ed. Acribia, S.A., Zaragoza, España.
- Watson, D.H., Meam, M.N. 1995. Migración de sustancias químicas desde el envase al alimento. Volumen II. Ed. Acribia, S.A. Zaragoza, España.

SUPPLEMENTARY BIBLIOGRAPHY

- AENOR. 1997. Análisis sensorial. Tomo 1. Alimentación: Recopilación de Normas UNE. AENOR. Madrid, España.
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- Ducauze, Ch. J. 2006. Fraudes alimentarios. indicaciones reglamentarias y metodología analítica. Ed. Acribia, S.A. Zaragoza, España
- Mijares M.I., Saez Illobre J.A. 1995. El vino: de la cepa a la copa. CDN-Ciencias de la Dirección. Madrid, España.
- Rosenthal, A.J. 2001. Textura de los alimentos. Medida y percepción. Ed. Acribia, S.A. Zaragoza, España.
- Sancho J., Bota E., De Castro J.J. 1999. Introducción al análisis sensorial de los alimentos. Edicions Universitat de Barcelona. Barcelona, España.
- Stone H., Sidel J.L. 1993. Sensory evaluation practices. Academic Press. California, USA.

RECOMMENDED LINKS

Organizations

- Agencia Española de Consumo, Seguridad Alimentaria y Nutrición – AECOSAN
http://www.aecosan.msssi.gob.es/AECOSAN/web/home/aecosan_inicio.htm
- Association of Official Analytical Chemists – AOAC
http://www.aoac.org/aoac_prod_imis/AOAC/Publications/Official_Methods_of_Analysis/AOAC_Member/Pubs/OMA/AOAC_Official_Methods_of_Analysis.aspx
- Codex Alimentarius
<http://www.fao.org/fao-who-codexalimentarius/en/>
- European Food Safety Authority – EFSA



<https://www.efsa.europa.eu/>

- European Food International Council – EUFIC
<http://www.eufic.org/es>
- European Federation for Biotechnology – EFB
<http://www.efbiotechnology.org/>
- Institute of Food Science & Technology – IFST
<https://www.ifst.org/>
- International Life Sciences Institute - ILSI
<http://ilsi.org/>
- International Organization for Standardization – ISO
<https://www.iso.org/home.html>
- Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente
<http://www.mapama.gob.es/es/>

Journals

- Critical Reviews in Food Science and Nutrition
<http://www.tandfonline.com/toc/bfsn20/current>
- Food Chemistry
<https://www.journals.elsevier.com/food-chemistry>
- International Journal of Food Science and Nutrition
<http://www.tandfonline.com/loi/ijf20>
- Journal of Agricultural and Food Chemistry
<http://pubs.acs.org/journal/jafcau>
- Journal of Food Composition and Analysis
<https://www.journals.elsevier.com/journal-of-food-composition-and-analysis>
- Journal of Association of Official Analytical Chemists International
http://www.aoac.org/aoac_prod_imis/AOAC/Publications/Journal_Of_AOAC/AOAC_Member/Publications/Journal_of_AOAC/The_Journal_of_AOAC.aspx
- Proceedings of the National Academy of Sciences
<http://www.pnas.org/>

Food Law

- Boletín Oficial de la Junta de Andalucía
<http://www.juntadeandalucia.es/boja>
- Boletín Oficial del Estado
<https://www.boe.es/>
- Diario Oficial de la Unión Europea
<http://eur-lex.europa.eu/oj/direct-access.html?locale=es>

Other Websites of Interest

- Confederación de Industrias Agro-Alimentarias de la Unión Europea - FoodDrinkEurope
<http://www.fooddrinkeurope.eu/>
- Federación Española de Industrias de la Alimentación y Bebidas – FIAB
<http://www.fiab.es/es/>
- Fundación Vasca para la Seguridad agro-alimentaria
<http://www.elika.eus/es/>
- Portal de Tecnologías Alimentarias
<http://www.alimentatec.com/default.asp>



TEACHING METHODOLOGY

- Participatory Lecture
- Workshops
- Laboratory practices and learning based on problem solving and case studies

ASSESSMENT (ASSESSMENT INSTRUMENTS, CRITERIA AND PERCENTAGE VALUE OF FINAL OVERALL MARK, ETC.)

CONTINUOUS ASSESSMENT SESSION

THEORY

- The evaluation of the theoretical part of the course will be done through written tests on the content of theoretical and workshops.
- There will be a midterm eliminatory exam (item 1 to 10) and a final exam as established in the official calendar of the degree examinations.
- Attendance at lectures is mandatory and attendance will be required at a minimum of 70% of the appropriations to be submitted to the eliminatory control.
- The scores of these tests will account for 60% of the final grade for the course.
- The approved control will not be saved for the next call
- Overcoming any of the tests will not be achieved without an even and balanced understanding of all the material evaluated in this test.

PRACTICES

- The completion of practices is mandatory, being essential to attend all sessions of the same and their improvement through a written test.
- Students who do not pass the test of practice, may recover a special examination upon completion of the course practices.
- The rating of practices account for a 20% of the final grade for the course.

WORKSHOPS

- Performing workshops by students is mandatory.
- The rating will be a 20% of the final grade.

Overcoming the course will mean having approved each of the parts and carried out the workshops.

EXTRAORDINARY ASSESSMENT SESSION

The theoretical knowledge will be evaluated following the same procedure described for the continuous evaluation. In the extraordinary evaluation, the autonomous work and practical qualifications will be kept, so that the sum of all the sections is 10.0

The scores of theoretical part, practices and workshops will be 60%, 20% and 20%, respectively of the final grade for the course. Overcoming the course will mean having approved each of the parts and carried out the workshops.

DESCRIPTION OF THE EXERCISES WHICH WILL CONSTITUTE SINGLE FINAL ASSESSMENT AS ESTABLISHED IN UGR REGULATIONS

ONE FINAL EVALUATION

Students who, for justified reasons, not been placed under continuous evaluation method take a final exam that will consist of a theoretical part and a practical part. The theoretical part will represent 70 and practice 30% of the final grade.

Overcoming the course will be approved each of the parties.



SCENARIO A (ON-CAMPUS AND REMOTE TEACHING AND LEARNING COMBINED)

TUTORIALS

TIMETABLE

(According to Official Academic Organization Plan)

TOOLS FOR TUTORIALS

(Indicate which digital tools will be used for tutorials)

Jesús Lozano Sánchez

https://directorio.ugr.es/static/PersonalUGR/*/show/5da2bd9a7d2d2ee5417a817451fd484c

Celia Monteagudo Sánchez

https://directorio.ugr.es/static/PersonalUGR/*/show/c3cd334b56d5e0309a89c685f44bf014

Face-to-Face tutorials by appointment: Dpto. Nutrición y Bromatología, 3ª planta, Facultad de Farmacia.

Appointment:

Email: jesusls@ugr.es, celiams@ugr.es

Plataforma docente: PRADO 2020-2021

Remote tutorials: Google Meet, a petición del estudiante.

MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY

- Participatory on-campus and remote lecture based on blended synchronous learning environments. Students will be able to attend face-to-face classes until full capacity is allowed. Video-conferencing tools: the classes will be taught synchronously face-to-face and virtual, using the MEET video-conferencing and streaming tools.
- Workshops on-campus.

MEASURES TAKEN TO ADAPT ASSESSMENT (Instruments, criteria and percentage of final overall mark)

Ordinary assessment session

CONTINUOUS ASSESSMENT SESSION

THEORY

- The evaluation of the theoretical part of the course will be done through written tests on the content of theoretical and workshops.
- There will be a midterm eliminatory exam and a final exam as established in the oficial calendar of the degree examinations.
- The scores of these tests will account for 60% of the final grade for the course.
- The approved control will not be saved for the next call
- Overcoming any of the tests will not be achieved without an even and balanced understanding of all the material evaluated in this test.

PRACTICES

- The completion of practices is mandatory, being essential to attend all sessions of the same and their improvement through a written test.
- Students who do not pass the test of practice, may recover a special examination upon completion of the course practices.
- The rating of practices account for a 20% of the final grade for the course.

WORKSHOPS

- Performing workshops by students is mandatory.
- The rating will be a 20% of the final grade.



Overcoming the course will mean having approved each of the parts and carried out the workshops.

Extraordinary assessment session

EXTRAORDINARY ASSESSMENT SESSION

The theoretical knowledge will be evaluated following the same procedure described for the continuous evaluation. In the extraordinary evaluation, the autonomous work and practical qualifications will be kept, so that the sum of all the sections is 10.0

The scores of theoretical part, practices and workshops will be 60%, 20% and 20%, respectively of the final grade for the course. Overcoming the course will mean having approved each of the parts and carried out the workshops.

Single final assessment

ONE FINAL EVALUATION

- Students who, for justified reasons, not been placed under continuous evaluation method take a final exam that will consist of a theoretical part and a practical part. The theoretical part will represent 70% and practice 30% of the final grade.
- Overcoming the course will be approved each of the parties.

SCENARIO B (ONCAMPUS ACTIVITY SUSPENDED)

TUTORIALS

TIMETABLE

(According to Official Academic Organization Plan)

TOOLS FOR TUTORIALS

(Indicate which digital tools will be used for tutorials)

Jesús Lozano Sánchez

https://directorio.ugr.es/static/PersonalUGR/*/show/5da2bd9a7d2d2ee5417a817451fd484c

Celia Monteagudo Sánchez

https://directorio.ugr.es/static/PersonalUGR/*/show/c3cd334b56d5e0309a89c685f44bf014

Remote tutorials: Google Meet, a petición del estudiante.

MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY

- Remote lecture and workshops based on video-conferencing tools: the classes will be taught virtual, using the MEET video-conferencing.

MEASURES TAKEN TO ADAPT ASSESSMENT (Instruments, criteria and percentage of final overall mark)

Ordinary assessment session

CONTINUOUS ASSESSMENT SESSION

THEORY

- The evaluation of the theoretical part of the course will be done through online tests on the content of theoretical and workshops.
- There will be a midterm eliminatory exam and a final exam as established in the oficial calendar of the



degree examinations.

- The scores of these tests will account for 60% of the final grade for the course.
- The approved control will not be saved for the next call

PRACTICES

- The completion of practices is mandatory, being essential to attend all online sessions of the same and their improvement through a online test.
- Students who do not pass the test of practice, may recover a special examination upon completion of the course practices.
- The rating of practices account for a 20% of the final grade for the course.

WORKSHOPS

- Performing workshops by students is mandatory.
- The rating will be a 20% of the final grade.

Overcoming the course will mean having approved each of the parts and carried out the workshops.

Extraordinary assessment session

The theoretical knowledge will be evaluated following the same procedure described for the continuous evaluation to scenario B. In the extraordinary evaluation, the autonomous work and practical qualifications will be kept, so that the sum of all the sections is 10.0

The scores of theoretical part, practices and workshops will be 60%, 20% and 20%, respectively of the final grade for the course. Overcoming the course will mean having approved each of the parts and carried out the workshops.

Single final assessment

- Students who, for justified reasons, not been placed under continuous evaluation method take a final exam that will consist of a theoretical part and a practical part. The theoretical part will represent 70% and practice 30% of the final grade.

Overcoming the course will be approved each of the parties

ADDITIONAL INFORMATION (if necessary)

