

MODULE	MATTER	YEAR	SEMESTER	CREDITS	TYPE
Food Science	Food analysis and Food science	2º	2º	6	Mandatory
LECTURERS			Postal address, telephone nº, e-mail address		
<ul style="list-style-type: none"> Dra. ROSA Mª GARCIA ESTEPA Dra. CELIA MONTEAGUDO SÁNCHEZ 		Part I Part II	Department of Nutrition and Food Science Faculty of Pharmacy, 3 rd floor Room: 315 and 320 e-mail: rgestepa@ugr.es celiams@ugr.es		
			TUTORIALS		
			http://www.ugr.es/~nutricion/pdf/tutorias1819.pdf		
DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT					
Science and Food Technology					
PREREQUISITES and/or RECOMMENDATIONS (if necessary)					
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 ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE)					
<ul style="list-style-type: none"> 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 PARTICULAR ABILITIES					
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 IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)

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

DETAILED SUBJECT 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



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Página 2

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- 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.

PRACTICES

Seminars / Workshops

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

Laboratory Practices

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



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Página 3

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Practice 7. - Determination of reducing sugars and acidity in honey

BIBLIOGRAPHY

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- AENOR. 2010. Análisis sensorial. 2ª edición, AENOR, Madrid, España.
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- AOAC 1993. Methods of Analysis for nutrition labeling. Eds. Sullivan, D.M.; Carpenter, D.E., Arlington, VA, USA.
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- Ibáñez F., Barcina Y. 2001. Análisis sensorial de alimentos: métodos y aplicaciones. Ed. Springer-Verlag. Barcelona, España.
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- 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.
- Anzaldúa-Morales A. 1994. La evaluación sensorial de los alimentos en la teoría y la práctica. Ed. Acribia, S.A. Zaragoza, España.
- Chamorro M.C., Losada M.M. 2002. El análisis sensorial de los quesos. Ed. Mundi-Prensa. Madrid, España.
- 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.
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RECOMMENDED INTERNET LINKS

Organizations



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Página 4

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- 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.fooddrinkurope.eu/>
- Federación Española de Industrias de la Alimentación y Bebidas – FIAB



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Página 5

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- <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
- Learning based on problem solving and case studies

EVALUATION (INSTRUMENTS, CRITERIA AND PERCENTAGE ON THE FINAL QUALIFICATION, ETC.)

ASSESSMENT OF THE THEORY

- The evaluation of the theoretical part of the course will be done through written tests
- There will be a midterm eliminatory exam (from 7.0) after the first part of the course (item 1 to 10) and a final exam as established in the oficial calendar of the degree examinations.
- The scores of these tests will account for 70% of the final grade for the course.
- The approved control (from 7.0) 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.
- 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.

ASSESSMENT PRACTICES

- The completion of laboratory 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 practices, may recover a special examination upon completion of the course practices.
- The approved practices will be kept at the two academic years following the completion of the course.
- The rating of practices account for a 20% of the final grade for the course.

ASSESSMENT OF WORKSHOPS

- Performing workshops by students is mandatory. It will be about subject matter of the subject and it will be elaborated in groups of students.
- The qualification of the work will mean 10% of the final grade

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

DESCRIPTION OF THE EVIDENCE THAT WILL BE PART OF THE FINAL UNIQUE EVALUATION ESTABLISHED IN THE "REGULATIONS OF EVALUATION AND GRADING OF THE STUDENTS OF THE UNIVERSITY OF GRANADA"



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Página 6

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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 75% practice and 25% of the final grade.
- Overcoming the course will be approved each of the parties.

ADDITIONAL INFORMATION

- Regulations of assessment and grading of students at the University of Granada
- The realization of the practices and the passing of the corresponding exam will be an indispensable requirement to pass the subject.



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Página 7

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