

COURSE GUIDE FOR  
**FOOD CHEMISTRY AND BIOCHEMISTRY**

Academic year 2020-2021

(Date last update: 03/07/2020)

(Date approved in Department Council: dd/mm/yyyy)

MODULE	SUBJECT MATTER	YEAR	SEMESTER	CREDITS	TYPE
Food Science	Food Chemistry and Biochemistry	2 <sup>nd</sup>	1 <sup>st</sup> gtñ.-nhb		Elective course
TEACHING STAFF <sup>(1)</sup>			ADDRESS, TELEPHONE NUMBER, EMAIL, ETC. DIRECCIÓN COMPLETA DE CONTACTO PARA TUTORÍAS (Dirección postal, teléfono, correo electrónico, etc.)		
<ul style="list-style-type: none"> <li>Miguel Navarro Alarcón: Part I “Food Chemistry”</li> <li>Concepción M. Aguilera García: Part II “Food Biochemistry”</li> <li>M<sup>a</sup> Dolores Mesa García: Part II “Food Biochemistry”</li> </ul>			Department of Nutrition and Food Science, 3rd floor, School of Pharmacy. Phone number: 958 249766 email: nalarcon@ugr.es Office number: 313		
			Department of Biochemistry and Molecular Biology II; Faculty of Pharmacy, Campus Universitario de Cartuja s/n, University of Granada email: caguiler@ugr.es and mdmesa@ugr.es Office number: 385		
			TIMETABLE FOR TUTORIALS OR LINK TO WEBSITE		
			<a href="http://www.ugr.es/~nutricion/pdf/tutorias2021.pdf">http://www.ugr.es/~nutricion/pdf/tutorias2021.pdf</a> <a href="http://farmacia.ugr.es/BBM2/index.html">http://farmacia.ugr.es/BBM2/index.html</a> CM Aguilera: Tuesday from 8:30 to 11:30 and from 12:30 to 15:30 h MD Mesa García: Wednesday from 9:00 to 11:30 and from 13:30 to 17:00 h		
BELONGS TO UNDERGRADUATE DEGREE PROGRAMME			AND ALSO TO OTHER UNDERGRADUATE DEGREE		

<sup>1</sup> 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/!](http://secretariageneral.ugr.es/pages/normativa/fichasugr/ngc7121/))



	PROGRAMMES
<i>Grado in Food Science and Technology</i>	
PREREQUISITES OR RECOMMENDATIONS (where applicable)	
Having studied the subjects of General Chemistry, Biochemistry, Applied Physics and Physical Chemistry, and Microbiology	
BRIEF DESCRIPTION OF CONTENT (ACCORDING TO OFFICIAL VALIDATION REPORT)	
Food composition, structure and reactions. Food additives and minor food ingredients	
GENERAL AND SPECIFIC COMPETENCES	
<ul style="list-style-type: none"> <li>CG1: Ability to express oneself correctly in the Spanish language in its disciplinary field.</li> <li>CG4: Ability to apply theoretical knowledge to practice.</li> <li>CG8: Critical reasoning.</li> <li>CG9: Motivation for quality.</li> <li>CG10: Ability to organize and plan.</li> <li>CG11: Ability to manage information.</li> <li>CG12: Ability to adapt to new situations.</li> <li>CE2: Know the food production models, their composition and physical, physical-chemical and chemical properties to determine their nutritional value and functionality.</li> <li>CE3: Know the techniques and carry out food analysis to guarantee optimal conditions for human consumption.</li> <li>CE11: Understand and value that food is one of the basic pillars of the cultural identity of a society.</li> <li>CE15: Inform, train and legally, scientifically and technically advise the public administration, the food industry and consumers to design intervention and training strategies in the field of food science and technology</li> </ul>	
OBJECTIVES (EXPRESSED AS EXPECTED LEARNING OUTCOMES)	
<ul style="list-style-type: none"> <li>Properly handle food raw materials and processed products in order to minimize or if possible prevent chemical and biochemical modifications.</li> <li>Ability to describe and explain food modifications due to manufacturing, preservation and spoilage processes</li> </ul>	
DETAILED SYLLABUS	
<p><b>THEORY:</b></p> <ul style="list-style-type: none"> <li>Topic 1. Introduction to the study of chemistry and biochemistry of foods. Concept and objectives of the Chemistry and Biochemistry of foods. Evolution and historical development. Relations with other sciences. Frontiers and prospects of Chemistry and Biochemistry of foods. Literature.</li> <li>Topic 2. THE WATER FROM THE FOOD. Structure and properties. Water activity: bound water and free water. Sorption isotherms. Hysteresis. Influence of the composition and physical state of a food on the activity of water in foods. Influence the water activity in the food stability.</li> <li>Topic 3. General properties of the protein systems of FOODS. General properties. Protein denaturation. Effect of physical and chemical agents on food proteins. Functional properties of proteins in food systems: solubility, hydration, viscosity, gelling texturizing, emulsifying, foam formation and fixing of substances responsible for flavor.</li> <li>Topic 4. Structure and properties of the main protein systems. Meat proteins. Fish protein. Egg proteins.</li> </ul>	



Milk proteins. Cereal proteins. Proteins of legumes.

- Topic 5. Food lipids. Molecular structure and functions of food lipids. Crystallization of the fats. Physical properties of fats. Emulsifying power of fats: structure of the emulsifier fats and emulsifying additives of lipid nature. Food emulsions: structure, stability and causes of destabilization. Modified fats: hydrogenation, inter- and intra-esterification processes and structured fats. Distribution of lipids in major food systems: meat, fish, milk, egg, milk and vegetables. Composition of fat and oil in foods of animal and vegetable origin.
- Topic 6. Food additives: overview, definition of additive and processing aid. Classification, definition and functions of different types of food additives. Legislative criteria of use, safety and dosing guidelines.
- Topic 7. Food additives and processing aids. Preservatives. Acidifying agents. Gasifying of bread dough. Use of buffers. Use of bases. Use of phosphates as moisturizers in muscular systems. Use of molten salts for homogenization of dairy products. Minor additives and ingredients used in bakery. Hardening agents. Release and anti-caking agents. Clarifying agents. Propellant gases.
- Topic 8. Dyes. Natural dyes: chlorophylls, carotenoids, anthocyanins, betalains and others. Artificial dyes: classification. Azo dyes. Triphenylmethane dyes derivatives. Indigo and its derivatives.
- Topic 9. The taste of food: primary flavors of food. Relationship between chemical structure and taste of food. Sapid structures more characteristics of certain flavors of foods.
- Topic 10. The aroma of foods. Relationship between structure and function of food flavorings. Primary flavors of foods. Theory lace-receptor coupling. Influence of different constituents in the aroma. Threshold as a matter of perception and flavor impact. Main biosynthetic pathways of the natural flavors of food. Generation of flavor in fermented foods. Flavor generation by the food processing.
- Topic 11. Monosaccharides, disaccharides and derivatives. Structure and function of carbohydrates in food. Monosaccharides and disaccharides of food. Functional properties of monosaccharides and disaccharides. In food. Sweetening power of monosaccharides and disaccharides. Food sweeteners: relationship between sweet taste and chemical structure. Sweetening power. Inverted syrups. Sweetener additives. Intense sweeteners and polyols: types, structure, characteristics and applications.
- Topic 12. Polysaccharides: starch. Structure. Conversion of starch into glucose. Starch oligosaccharides. Dextrins. Cidoamiloses. Starch derivatives. Modified starches: type, collection, structure, properties and applications. Biophysical and biochemical changes that occur during thermal and chemical gelatinization of starches.
- Topic 13. Polysaccharides: cellulose and derivatives. Cellulose. Hemicelluloses. Cellulose derivatives.
- Topic 14. Polysaccharides: gums. Pectins. Plant exudates gums: Arabic gum and tragacanth gum. Seed gums: guar gum and locust bean gum. Seaweed gums: alginates, carrageenans and agar-agar. Bacterial gums: xanthan gum.
- Topic 15. Minerals. Introduction. Principles of chemistry of minerals: concept of speciation, solubility in aqueous systems, and minerals and acid-base chemistry. Mineral composition of food: influencing factors and supplementation. Bioavailability of minerals: concept, influencing factors and assessment methods. Nutritional use of minerals. Specific bioavailability characteristic elements. Effects of processing on mineral content of foods. Chemical and functional properties of minerals in foods.
- Topic 16. Vitamins. Distribution of vitamins in food. Influence of type of food and maturing on the vitamin content of food. Influence of different technological processes and cooking on the vitamin content of foods. Bioavailability of vitamins. Adding vitamins to foods. Main food market supplemented.
- Topic 17. Introduction to the enzymology of food. Introduction. Food enzymes of interest: carbohydrate hydrolases, lipases, proteases. Other enzymes of interest in food: isomerases, oxidoreductases, lyases and ligases.
- Topic 18. Alterations of food. Overview.
- Topic 19. Oxidation of lipids: introduction. General classification of oxidative pathways of food. Mechanisms of chemical oxidation of foodstuffs. Regulatory factors and preventing of the chemical oxidation. Other lipid oxidative pathways. Evaluation of the oxidation of a fat. Frying process. Causes that affect the average life of frying oils and maintenance of quality. Parameters for assessing the quality of a frying fat.



- Topic 20. Enzymatic browning. Introduction. Polyphenol-oxidases. Monophenol-oxidases. Diphenol-oxidases. Substrates. Mechanisms of action. Inhibitors.
- 2 Topic 1. Non-enzymatic browning: mechanisms, regulatory factors and prevention.XXXXX.
- [...]

**PRACTICE:**

**Seminars/Workshops**

- Exhibition of works by students on food proteins and additives.
- Seminar on functional foods.

**Laboratory work**

**Session 1. Assessing the quality of a meat product**

- Determination of its total fat content as well as its chromatographic profile.
- Determination of its total protein content.
- Measurement of its collagen levels.

**Session 2. Determination of polyphenoloxidase activity in fruit mesocarp**

**Session 3. Practice 3. Enzymatic determination of lactose in milk.**

**Session 4. Determining of the concentration of lactate in meat XXXXX.**

**BIBLIOGRAPHY**

**BASIC READING LIST**

- Introducción a la bioquímica de los alimentos. J. B. S. Braverman. Omega., S. A. Barcelona, 1980.
- Proteínas alimentarias. Bioquímica. Propiedades funcionales. Valor nutritivo. Modificaciones químicas. J. C. Cheftel, J. L. Cuq y D. Lorient. Acribia, S. A. Zaragoza, 1989.
- Biochemistry of food. Eskin, 1990.
- Manual de bioquímica de los alimentos. C. Alais y G. Linden. Masson, S. A. Barcelona, 1990.
- Química de los alimentos: mecanismos y teoría..D. W.S. Wong. Acribia, S. A. Zaragoza, 1995.
- Química de los alimentos, 4ª edn. H. D. Belitz y W. Grosch. Acribia, S. A. Zaragoza, 1997.
- Manual de química y bioquímica de los alimentos, 3ª edn. T. P. Coultate. Acribia, S.A. Zaragoza, 1998.
- Bioquímica y valor nutritivo de los alimentos. D. S. Robinson. Acribia, S. A. Zaragoza, 2000.
- Química de los alimentos, 2ª edn. O. R. Fennema. Acribia, S. A.. Zaragoza, 2000.
- Introducción a la bioquímica y tecnología de los alimentos, vol. I, 4ª edn. J. C. Cheftel y H. Cheftel. Acribia, S. A. Zaragoza, 2000.
- Mataix Verdu J. (2002). Nutrición y alimentación humana (2 tomos). Ed. Ergon. Madrid.
- Tratado de nutrición: tomo I (Bases fisiológicas y bioquímicas de la nutrición) y tomo II (Composición y calidad nutritiva de los alimentos). GIL, A. Editorial Acción Médica. Madrid, 2005.
- Química de los alimentos, 4ª edición. Baduí Dergal, S. Editorial Pearson, México, 2006
- Química de los alimentos, 5ª edición. Baduí Dergal, S. Editorial Pearson, México, 2012
- Química de los alimentos, 5ª edn. W. Baltes. Acribia S.A. Zaragoza 2007.
- Food Chemistry , 4th revised and extended revision. H. D. Belitz, W. Grosch, P. Schieberle. Springer-Verlag, Leipzig, 2009.
- Composición y calidad nutritiva de los alimentos. Tomo II. (2010). Gil, A, editor. Tratado de Nutrición, 2ª edición. Ed. Médica Panamericana. Madrid.
- Química de los alimentos, 2ª edn. K. L. Parkin. S. Damodaran, O. R. Fennema. Acribia, S. A.. Zaragoza, 2010
- Química de los alimentos Belitz HD, Grosch W, Schieberle P., 4th ed. Ed. Springer Verlag, Leipzig 2012.
- Química de los alimentos, 5ª edición. Baduí Dergal, S. Editorial Pearson, México, 2012
- Composición y calidad nutritiva de los alimentos. Tomo III. (2017). Gil, A, editor. Tratado de Nutrición, 3ª



edición. Ed. Médica Panamericana. Madrid. Nutrición y bromatología.

- Química de los alimentos 4ª edn. S. Damodaran, K. L. Parkin . Acribia, S. A.. Zaragoza, 2019.

#### COMPLEMENTARY READING

- Aditivos y auxiliares de fabricación en las industrias agroalimentarias, 2ª Edición. Multon, J. L. Editorial Acribia, S. A. Zaragoza 1999.
- Toxicología alimentaria. Camean, A.M.; Repetto, M. Editorial Díaz de Santos, Madrid, 2006.
- Bases de la alimentación humana. Rdriguez River, V.M., y Simón Magro, E. Netbiblo, S.L. La Coruña, 2008.
- Nutrición y alimentación. Mataix, J. Editorial Ergon. Majadahonda (Madrid), 2009.
- Bases fisiológicas y bioquímicas de la nutrición. Tomo I. (2010). Gil, A, editor. Tratado de Nutrición, 2ª edición. Ed. Médica Panamericana. Madrid.
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- Navarro Alarcón M, Oliveras López MJ, López García de la SerranA, H (2018). Editorial Técnica Avicem. Granada.

#### RECOMMENDED LINKS

- <http://www.laisla.com/uned/unitaria/com> (valor energético de los alimentos, tablas de composición de los alimentos, facilita la descarga de ciertos programas, tablas de composición de alimentos, etc..)
- <http://www.senba.es/> (libros editados, recursos didácticos en red, otras web de interés)
- <http://seenweb.org/>
- <http://www.biosearchlife.es/pb/home.jsp#> (aspectos sobre alimentos funcionales)
- <http://www.pulevasalud.com/ps/index.jsp>
- <http://www.puleva.es/pf/index.html>
- <http://www.nestle.es/web/index.aspx>[http://sauwok.fecyt.es/apps/WOS\\_GeneralSearch\\_input.do?product=WOS&search\\_mode=GeneralSearch&SID=X2Fhelp7LEe9D3lg6p\]&preferencesSaved=](http://sauwok.fecyt.es/apps/WOS_GeneralSearch_input.do?product=WOS&search_mode=GeneralSearch&SID=X2Fhelp7LEe9D3lg6p]&preferencesSaved=) (página web del Science Citation Index Web of Science)

#### TEACHING METHODOLOGY

- Theoretical classes: In-person theoretical classes will be taught in which the blackboard will be used and as support material transparencies, slides, animated diagrams and videos. This material will be accessible to the student through the web page of the subject, which will use the SWAD program of the University of Granada. When necessary, photocopies with the relevant diagrams will be supplied in class. The importance of study using textbooks will be stressed. The teachers will direct the students so that certain topics of the program are conveniently studied before their discussion in the theoretical class. Studying only with class notes is not considered formative enough. Students may interrupt the teacher's explanations as many times as necessary to request clarifications or resolve doubts, as well as to request additional information. Similarly, the teacher may require the participation of students in the discussion.
- Laboratory practical classes: compulsory attendance. Classes on practical foundations in a laboratory of the departments of Biochemistry and Molecular Biology and of Nutrition and Food Science. Each student must submit the results obtained. Your evaluation will be carried out based on both a 1-hour written test and the results presented.

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

- In accordance with the regulations for the evaluation and qualification of the students of the University of Granada approved on May 20, 2013, the evaluation will be continuous with the exception provided in said



regulations, in which a single final exam will be held.

- **Continuous assessment**  
It will be based on the evaluation of student work throughout the course and participation will be valued active in theoretical and practical classes, proposed activities, seminars, tutorials, etc. The oldest weight will fall on answers to written tests.
- **Evaluation criteria**
  - The grade of the subject would be obtained considering 40% of the global grade for the theoretical part of Food Chemistry, another 40% for the theoretical part of Food Biochemistry, as well as 10% for the practical part of Chemistry Food and another 10% for the practical part of Food Biochemistry.
  - The evaluation of the theoretical knowledge of the subject syllabus will consist of:
    - a) Taking 1 partial exam for the Food Chemistry part and another partial exam for the Food Biochemistry part. The partials are independent and eliminatory from 5.
    - b) All exams will have a part of test questions about basic contents of the subject. Another part of the exam will consist of various questions with which the most specific knowledge as well as the synthesis and general comprehension abilities of the subject will be assessed. Each of these parts will be scored with a maximum of 5 points.
- **To pass the course it will be essential:**
  - Have completed the practices and have passed the corresponding exam. In the event that a student does not do the practicals, they can pass a practical exam in the laboratory.
  - Have passed the two written exams, either at the time or at the end of the term. None of the approved partials will be saved for the next call.
  - The grade obtained in each of the 2 theoretical exams will contribute 40% to the final grade. It is necessary to achieve at least 40% of the theoretical knowledge grade (4 points out of 10 total points), to measure the marks obtained in the practical knowledge evaluation.
- **The evaluation of the knowledge and practical skills of the subject will be divided into the 2 parts that it includes: Food chemistry (it will mean 10% of the final grade awarded) and Food Biochemistry (it will mean 10% of the grade). final awarded). The practical report presented by the students will be evaluated and it will be necessary to pass an exam for each of the 2 referred parts of the subject.**
  - Students who do not pass any of the 2 parts of the practices will be able to recover them in an extraordinary exam when they finish all the practice groups of the subject.
  - The approved practices will keep a maximum of 2 academic courses following the completion.
- **Teachers may take supplementary oral exams whenever necessary to better weigh the grade or when in doubt about the authenticity of written exercises. When appropriate, a final evaluation will be carried out through an individual interview of the student with the professor of the subject or with a tribunal made up of 3 professors from the Department.**

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

- According to the Regulations for the Evaluation and Qualification of Students of the University of Granada (Approved by the Governing Council in its extraordinary session of May 20, 2013), the completion of a single final evaluation is contemplated, which may be accepted by those Students who are unable to comply with the continuous assessment method due to work reasons, health status, disability or any other duly justified reason that prevents them from following the continuous assessment regime. To qualify for the final single evaluation, the student, in the first two weeks after the formalization of their enrollment, will request it from



the Director of the Department, who will transfer it to the corresponding teaching staff, alleging and accrediting the reasons that assist them for not being able to follow the continuous evaluation system. If ten days have elapsed without the student having received an express written response from the Director of the Department, it shall be understood that this has been rejected. In case of refusal, the student may file, within a month, an appeal before the Rector, who may delegate to the Dean or Director of the Center, exhausting the administrative route.

- Students who have opted for this system and have been admitted to it, will have to take and pass a test-type exam and / or development questions, which would represent 40% of the final grade to assess the theoretical knowledge of the part of Food Chemistry, another test type exam and / or development questions that would also represent 40% of the final grade to assess the theoretical knowledge of the Food Biochemistry part; and a theoretical-practical exam that would suppose 10% of the final grade to evaluate the practical knowledge of the Food Chemistry part, and finally another theoretical-practical exam that would also suppose the remaining 10% to evaluate the practical knowledge of the part of Food Biochemistry. The student may be required by the teaching staff in order to assess their grade.
- Teachers may take supplementary oral exams whenever necessary to better weigh the grade or when in doubt about the authenticity of written exercises. When appropriate, a final evaluation will be carried out by means of an individual interview of the student with the professor of the subject or with a tribunal made up of 3 professors from the Department.
- Extraordinary call  
There will be a single exam similar to the second exam of the ordinary call that will include all the subject matter. The grade of any theory exam will not be saved, although the practical grade will be saved.
- Important:  
Teachers will be able to take complementary oral exams whenever necessary to better weigh the grade or when in doubt about the authenticity of written exercises.
- The approved partials are not saved for the next course.
- The completion of the practices or any of the written exams implies that the corresponding grade will appear in the Minutes corresponding to the ordinary call in February, even though the student has not taken the final exam.
- Teachers may take supplementary oral exams whenever necessary to better weigh the grade or when in doubt about the authenticity of written exercises. When appropriate, a final evaluation will be carried out by means of an individual interview of the student with the professor of the subject or with a tribunal made up of 3 professors from the Department.

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

#### TUTORIALS

##### TIMETABLE

(According to Official Academic Organization Plan)

<http://www.ugr.es/~nutricion/pdf/tutorias2021.pdf>

<http://farmacia.ugr.es/BBM2/index.html>

The schedule is not modified.

Request an appointment

##### TOOLS FOR TUTORIALS

(Indicate which digital tools will be used for tutorials)

- PRADO 2, UGR email, GOOGLE MEET

#### MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY

- Classes will be taught face-to-face and / or virtual, using GOOGLE MEET's videoconferencing tools,



respecting the same schedule that appears in the Teaching Guide for this subject.

- The most relevant teaching material used in virtual classes will be available on the PRADO platform, as well as other resources that the teacher considers important to complement the student's training.
- The tutorials, queries and clarifications may be done in person in the teachers' offices and / or using the PRADO platform, GOOGLE MEET and the email of the Ugr.
- Face-to-face and / or virtual practices through google meet.

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

##### Ordinary assessment session

- In-person exam in principle. If this is not possible, the PRADO platform tool will be used to carry out the exam.
- The grade for the course would be obtained considering 40% of the overall grade for the theoretical part of Food Chemistry, another 40% for the theoretical part of Food Biochemistry, as well as 10% for the practical part of Chemistry Food and another 10% for the practical part of Food Biochemistry.
- The evaluation of the theoretical knowledge of the subject syllabus will consist of:
  - Taking 1 partial exam for the Food Chemistry part and another partial exam for the Food Biochemistry part. The partials are independent and eliminatory from 5.
  - All the exams will have a part of test questions (20-30 / part) about the basic contents of the subject. Another part of the exam will consist of various questions (essay type 2-4 questions / part) with which the most specific knowledge as well as the synthesis and general comprehension skills of the subject will be assessed. Each of these parts will be scored with a maximum of 5 points.
- To pass the course it will be essential:
  - Have completed the practices and have passed the corresponding exam. In the event that a student does not carry out the practices, they may pass a practical exam in the laboratory or virtual on the indicated platforms available for this purpose
  - Have passed the two written exams, either at the time or at the end of the term. None of the approved partials will be saved for the next call.
  - The grade obtained in each of the 2 theoretical exams will contribute 40% to the final grade. It is necessary to achieve at least 40% of the theoretical knowledge grade (4 points out of 10 total points), to measure the marks obtained in the practical knowledge evaluation.
- The evaluation of the knowledge and practical skills of the subject will be divided into the 2 parts that it includes: Food chemistry (it will mean 10% of the final grade awarded) and Food Biochemistry (it will mean 10% of the grade). final awarded). The practical report presented by the students and the attendance will be evaluated, and it will be necessary to pass an exam for each of the 2 referred parts of the subject. If the practices cannot be taught in person, they will be taught electronically, through the google meet platform. The practical exam would consist of about 10 test-type questions and the resolution of the calculations corresponding to some of the practices developed, through the PRADO platform, in the event that it cannot be done in person.
- Students who do not pass any of the 2 parts of the practices, will be able to recover them in an extraordinary exam when they finish all the groups of practices of the subject.
- The approved practices will keep a maximum of 2 academic courses following the completion

##### Extraordinary assessment session

- In-person exam in principle. If this is not possible, the PRADO platform tool will be used to carry out the exam.
- The grade for the course would be obtained considering 40% of the overall grade for the theoretical part of Food Chemistry, another 40% for the theoretical part of Food Biochemistry, as well as 10% for the practical





part of Chemistry Food and another 10% for the practical part of Food Biochemistry.

- The evaluation of the theoretical knowledge of the subject syllabus will consist of:
  - Taking 1 exam for the Food Chemistry part and another exam for Food Biochemistry. The 2 parts are independent and heats from 5.
  - All the exams will have a part of test questions (20-30 / part) about the basic contents of the subject. Another part of the exam will consist of various questions (essay type 2-4 questions / part) with which the most specific knowledge as well as the synthesis and general comprehension skills of the subject will be assessed. Each of these parts will be scored with a maximum of 5 points.
- To pass the course it will be essential:
  - Have completed the practices and have passed the corresponding exam.
  - Have passed both written exams.

#### Single final assessment

- In-person exam in principle. If this is not possible, the PRADO platform tool will be used to carry out the exam.
- Students who have opted for this system and have been admitted to it, will have to take and pass a test-type exam and / or development questions, which would represent 40% of the final grade to assess the theoretical knowledge of the part of Food Chemistry, another test type exam and / or development questions that would also represent 40% of the final grade to assess the theoretical knowledge of the Food Biochemistry part; and a theoretical-practical exam that would suppose 10% of the final grade to evaluate the practical knowledge of the Food Chemistry part, and finally another theoretical-practical exam that would also suppose the remaining 10% to evaluate the practical knowledge of the part of Food Biochemistry. The student may be required by the teaching staff in order to assess their grade.
- Teachers may take supplementary oral exams whenever necessary to better weigh the grade or when in doubt about the authenticity of written exercises.
- The approved partials are not saved for the next course.
- The completion of the practices or any of the written exams implies that the corresponding grade will appear in the Minutes corresponding to the ordinary call in February, even though the student has not taken the final exam

### SCENARIO B (ONCAMPUS ACTIVITY SUSPENDED)

#### TUTORIALS

##### TIMETABLE

(According to Official Academic Organization Plan)

<http://www.ugr.es/~nutricion/pdf/tutorias2021.pdf>  
<http://farmacia.ugr.es/BBM2/index.html>  
 The schedule is not modified.  
 Request an appointment

##### TOOLS FOR TUTORIALS

(Indicate which digital tools will be used for tutorials)

- PRADO 2, UGR email, GOOGLE MEET

#### MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY

- Classes will be taught face-to-face and / or virtual, using GOOGLE MEET's videoconferencing tools, respecting the same schedule that appears in the Teaching Guide for this subject.
- The most relevant teaching material used in virtual classes will be available on the PRADO platform, as well as other resources that the teacher considers important to complement the student's training.



- The tutorials, queries and clarifications may be done in person in the offices of the teachers and / or using the PRADO platform, GOOGLE MEET and the email of the Ugr.
- Virtual practices through google meet.

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

##### Ordinary assessment session

- Tool: PRADO 2020 Platform
- The grade for the course would be obtained considering 40% of the overall grade for the theoretical part of Food Chemistry, another 40% for the theoretical part of Food Biochemistry, as well as 10% for the practical part of Chemistry Food and another 10% for the practical part of Food Biochemistry.
- The evaluation of the theoretical knowledge of the subject syllabus will consist of:
- The completion of 1 partial exam for the Food Chemistry part and another partial exam for the Food Biochemistry part. The partials are independent and eliminatory from 5.
- All the exams will have a part of test questions (20-30 / part) about the basic contents of the subject. Another part of the exam will consist of various questions (essay type 2-4 questions / part) with which the most specific knowledge as well as the synthesis and general comprehension skills of the subject will be assessed. Each of these parts will be scored with a maximum of 5 points.
- To pass the course it will be essential:
- Have completed the practices and have passed the corresponding exam. In the event that a student does not carry out the practices, they may pass a practical exam in the laboratory or virtual on the indicated platforms available for this purpose
- Have passed both written exams, either at the time or at the end of the semester. None of the approved partials will be saved for the next call.
- The grade obtained in each of the 2 theoretical exams will contribute 40% to the final grade. It is necessary to achieve at least 40% of the theoretical knowledge grade (4 points out of 10 total points), to measure the marks obtained in the practical knowledge evaluation.
- The evaluation of the knowledge and practical skills of the subject will be divided into the 2 parts that it includes: Food chemistry (it will mean 10% of the final grade awarded) and Food Biochemistry (it will mean 10% of the grade). final awarded). The practical report presented by the students and the attendance will be evaluated, and it will be necessary to pass an exam for each of the 2 referred parts of the subject. If the practices cannot be taught in person, they will be taught electronically, through the google meet platform. The practical exam would consist of about 10 test-type questions and the resolution of the calculations corresponding to some of the practices developed, through the PRADO platform, in the event that it cannot be done in person.
- Students who do not pass any of the 2 parts of the practices, will be able to recover them in an extraordinary when they finish all the practice groups of the subject.
- The approved practices will keep a maximum of 2 academic courses following the completion

##### Extraordinary assessment session

- Tool: PRADO 2020 Platform
- The grade for the course would be obtained considering 40% of the overall grade for the theoretical part of Food Chemistry, another 40% for the theoretical part of Food Biochemistry, as well as 10% for the practical part of Chemistry Food and another 10% for the practical part of Food Biochemistry.
- The evaluation of the theoretical knowledge of the subject syllabus will consist of:
  - Taking 1 exam for the Food Chemistry part and another exam for Food Biochemistry. The 2 parts are independent and heats from 5.



- All the exams will have a part of test questions (20-30 / part) about the basic contents of the subject. Another part of the exam will consist of various questions (essay type 2-4 questions / part) with which the most specific knowledge as well as the synthesis and general comprehension skills of the subject will be assessed. Each of these parts will be scored with a maximum of 5 points.

- To pass the course it will be essential:
  - Have completed the practices and have passed the corresponding exam.
  - Have passed both written exams.

#### Single final assessment

- Tool: PRADO 2020
- Students who have opted for this system and have been admitted to it, will have to take and pass a test-type exam and / or development questions, which would represent 40% of the final grade to assess the theoretical knowledge of the part of Food Chemistry, another test type exam and / or development questions that would also represent 40% of the final grade to assess the theoretical knowledge of the Food Biochemistry part; and a theoretical-practical exam that would suppose 10% of the final grade to evaluate the practical knowledge of the Food Chemistry part, and finally another theoretical-practical exam that would also suppose the remaining 10% to evaluate the practical knowledge of the part of Food Biochemistry. The student may be required by the teaching staff in order to assess their grade.
- Teachers may take supplementary oral exams whenever necessary to better weigh the grade or when in doubt about the authenticity of written exercises.
- The approved partials are not saved for the next course.
- The completion of the practices or any of the written exams implies that the corresponding grade will appear in the Minutes corresponding to the ordinary call in February, even though the student has not taken the final exam.

#### ADDITIONAL INFORMATION (if necessary)

