# Course Guide for Human Cell Physiology

## Academic Year 2020-2021

(Date last update: 01/07/2020)
(Date approved in Department Council: 08/07/2020)

<table>
<thead>
<tr>
<th>MODULE</th>
<th>SUBJECT MATTER</th>
<th>YEAR</th>
<th>SEMESTER</th>
<th>CREDITS</th>
<th>TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic common knowledge</td>
<td>Physiology</td>
<td>1st</td>
<td>2nd</td>
<td>6 ECTS (4.5 T + 1.5 P)</td>
<td>Basic</td>
</tr>
</tbody>
</table>

### Teaching Staff

- Virginia Aparicio García-Molina (T*; P*)
- Mª Alba Martínez Burgos (T*)
- Alfonso Varela López (T*)
- Mª Dolores Yago Torregrosa (P*)
- José Manuel Romero Márquez (T*)
- Iryna Rusanova (P*)

(T*: Theory; P*: Practice)

<table>
<thead>
<tr>
<th>Address, Telephone Number, Email, etc.</th>
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<tbody>
<tr>
<td>Dpt. Physiology, 1st floor, Faculty of Pharmacy, Cartuja Campus. 958243879 <a href="mailto:virginiaparicio@ugr.es">virginiaparicio@ugr.es</a>; <a href="mailto:malbam@ugr.es">malbam@ugr.es</a>; <a href="mailto:alvarela@ugr.es">alvarela@ugr.es</a>; <a href="mailto:mdyago@ugr.es">mdyago@ugr.es</a>; <a href="mailto:romeromarquez@ugr.es">romeromarquez@ugr.es</a>;</td>
</tr>
</tbody>
</table>

### Timetable for Tutorials or Link to Website

http://www.ugr.es/~fisiougr/tutorias.php

### Belongs to Undergraduate Degree Programme

- Human Dietetics and Nutrition

### Also To Other Undergraduate Programmes

### Prerequisites or Recommendations (where applicable)

- To have background knowledge of: Biology, Human Anatomy and Histology, Chemistry.
- A good standard of English and computer skills are also required.

### Brief Description of Content (According to Official Validation Report)

Introduction to General and Cell Physiology. Function of organ systems: nervous, digestive and endocrine systems.

### General and Specific Competences

#### General Abilities

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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/ncg7121/?)
- CG2. To develop the profession as for other professionals of the health, acquiring skills to be employed at team
- CG3. To recognize the need to support and update the professional competence, giving special importance to the
  learning, of an autonomous and continued way, of new knowledge, products and skills in nutrition and food, as
  well as to the motivation for the quality
- CG4. To know the limits of the profession and their competences, identifying, when a treatment is necessary to
  interdisciplinary or the derivation to another professional
- CG5. To realize the communication of an effective way, so much of oral such as written form, with the persons,
  the professionals of the health or the industry and the mass media, being able to use the technologies of the
  information and the communication specially the related ones to nutrition and habits of life
- CG29. To acquire the basic training for the investigative activity, being capable of formulating hypothesis,
  gathering and interpreting the information for the resolution of problems following the scientific method, and
  understanding the importance and the limitations of the scientific thought in sanitary and nutritional matter.

SPECIFIC ABILITIES
- CE1. To know the chemical, biochemical and biological foundations of application in human and dietetic nutrition
- CE2. To know the structure and function of the human body from the molecular level to the complete organism,
  in the different stages of the life
- CE26. To know the nutrients, their functions and their metabolic utilization. To know the bases of the nutritional
  balance and their regulation

OBJECTIVES (EXPRESSED AS EXPECTED LEARNING OUTCOMES)
- To gain knowledge about the functioning of the human organism with the aim of relating nutrition to
  maintenance of body functions.
- To understand the physiological processes, analyzing their biological significance, description,
  regulation and integration at the different levels of organization, in health.
- To establish the bases to comprehend the modifications of physiological processes as a form of
  adaptation to a changing environment.
- To relate concepts to previous knowledge and acquire sufficient basis for subsequent learning.

DETAILED SYLLABUS

THEORETICAL CONTENTS
- Thematic unit 1. Introduction to Physiology.
- Thematic unit 2. Excitability.
- Thematic unit 4. Synaptic transmission.
- Thematic unit 5. General concepts of the physiology of the muscular fibers.
- Thematic unit 6. Structure of the nervous system.
- Thematic unit 7. General principles of sensory physiology.
- Thematic unit 8. Physiology of the taste.
- Thematic unit 9. Physiology of the smell.
- Thematic unit 10. Introduction to the somatovisceral sensibility.
- Thematic unit 11. Introduction to the physiology of vision.
- Thematic unit 12. Introduction to the physiology of hearing and balance
- Thematic unit 13. Peripheral organization of autonomic nervous system.
- Thematic unit 14. Central organization of the autonomic nervous system.
• Thematic unit 15. Nervous system and control of the ingestion and other superior functions.
• Thematic unit 17. Composition, function and regulation of the salivary and gastric secretion.
• Thematic unit 18. Composition, function and regulation of the pancreatic secretion.
• Thematic unit 19. Composition, function and regulation of the biliary and intestinal secretions.
• Thematic unit 20. Digestion and absorption.
• Thematic unit 21. General organization of the endocrine system and neuroendocrine integration.
• Thematic unit 22. Physiology of the thyroid gland.
• Thematic unit 23. Hormonal regulation of growth.
• Thematic unit 24. Hormonal regulation of the metabolism of calcium and phosphate.
• Thematic unit 25. Physiology of the endocrine pancreas.
• Thematic unit 26. Physiology of the adrenal gland.
• Thematic unit 27. Hormonal regulation of ion and water balance.

LABORATORY PRACTICE PROGRAM

• Practice 1. Functional anatomy of human body.
• Practice 2. Gustatory and olfactory receptors.
• Practice 3. Endocrine system. Effect of thyroxin, TSH and propylthiouracil on basal metabolism.
• Practice 4. Determination of the glycemic profile.
• Practice 5. Physico-chemical processes of digestion.

BIBLIOGRAPHY

CORE BIBLIOGRAPHY

Textbooks (specific bibliography)

• Martín Cuenca E. "Fundamentos de Fisiología". Thompson, 2006.
FURTHER READING

**Textbooks (specific bibliography)**

**Dictionaries and atlases**

**Periodical publications (journals)**
- Annual Review of Physiology
- Current Advances in Physiology
- News in Physiological Sciences
- Physiological Reviews

**Lab manuals**
- Varios. Cuaderno de Prácticas de Fisiología Celular y Humana. Departamento de Fisiología. Facultad de

**Computer simulations**

**RECOMMENDED LINKS**
WEB RESOURCES

http://www.vivo.colostate.edu/hbooks/pathphys/digestion/ Digestive Physiology
http://www.tiroides.net Information and support for the patient with thyroid disease
https://www.hhmi.org/biointeractive/neuroscience-collection Neuroscience, a rich variety of videos, interactive modules, and animations to teach about the nervous system
http://www.physiologyweb.com/ Physiology Web
http://www.mhhe.com/biosci/ap/vander8e/student_index.mhtml Get Body Smart: An online examination of human anatomy & physiology

SCIENTIFIC SOCIETIES

http://www.the-aps.org/ The American Physiological Society
http://physoc.org/ The Physiological Society
http://www.secf.es/ Spanish Society of Physiological Sciences
http://www.feps.org/ Federation of European Physiology Societies

TEACHING METHODOLOGY

We feature a program with a high degree of coherence and integration, which covers the needs of the student of the Degree in Food Science and Technology. The theoretical contents of the program will be developed through a combination of teaching techniques that we intend to be educational and innovative. In the first place, most of the theoretical topics will be presented in the classical way through master classes by the teacher himself, but taking advantage of information and communication technologies (ICTs) to facilitate the teaching-learning process. A small selection of the agenda will be presented by the students themselves, using for their preparation part of the autonomous work that they must carry out in person. This work will be supervised at all times by the teacher. During the course, face-to-face tutoring as well as interactivity through digital platforms will abound.

THEORETICAL CLASSES:
- Exposition of the subject in master classes by the professor, with introduction of the different sections that make up the subject, breakdown of the points to be dealt with in the development of the subject and its extension.
- Multimedia teaching material will be included in the exposition of the master classes, to facilitate the understanding of those more complex physiological phenomena for the students.
- Proposal for consultation sources (texts, published works, specialized magazines, web page addresses, etc.), in which to search for information for the various topics of the program.

Directed exhibitions and seminars:
- Classroom presentation of the topics prepared by the students. The topics will be distributed among the students with enough time in advance for them to prepare and be supervised by the teacher before the exhibition, during which the debate among the students will be encouraged, with the teacher of the subject acting as moderator.
- Study, commentary and discussion on practical cases related to the Physiology of specific systems and devices.
- Tutorials: periodic meetings in specific tutorials where to solve doubts or concerns raised by the students.
- Seminars, which are intended to deal with those topics not directly included in the program but that are of interest to the student.

PRACTICAL CLASSES:
The professor will explain and carry out the practice before a small group of students, then the student will carry out the practice individually supervised by the teacher and will complete the different activities proposed in the practice notebook. In these classes it is intended that the student acquire fluency in instrumental handling and learn to solve problems derived from working in the laboratory. At the end, he will deliver the notebook with the results obtained individually, in addition to collecting the different experimental observations. This notebook will be corrected by the professor and will be returned to the student with the corresponding qualification.

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

This is the default system. Continuous Assessment includes several theory exams which will take place on dates scheduled by the Faculty in coordination with the other subjects offered in the term. Prior to the exam, the lecturer will describe the structure and type of exam questions. Coursework performed by the students (essays, presentations, seminars...) as well as regular attendance and class participation will be also assessed.

The final mark will be calculated according to the following:

- Theory: 70%
- Laboratory practice: 10%
- Coursework (presentations, seminars, etc.) and attendance to theoretical classes: 20%

A minimum mark of 5 (out of 10) in both the theory and laboratory practice sections must be obtained in order to pass the subject.

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

According to the Regulations of evaluation and qualification of the students of the University of Granada. Consolidated text of the Regulations approved by the Agreement of the Governing Council of May 20, 2013 (BOUGR No. 71, of May 27, 2013) and amended by the Agreements of the Governing Council of February 3, 2014 (BOUGR no. 78, of February 10, 2014); June 23, 2014 (BOUGR No. 83, June 25, 2014) and October 26, 2016 (BOUGR No. 112, November 9, 2016); Includes bug fixes for December 19, 2016 and May 24, 2

By virtue of this, the allocation of points in the final single evaluation system will be made according to the percentages: Theoretical classes: 90% Practical classes: 10%, with the following specifications:

- Evaluation of the theoretical contents: Students will be evaluated by taking a final exam that proves that the student has acquired the completeness of the skills described in the teaching guide.

- Evaluation of laboratory practices. Students must pass a practical exam that will consist of completing one of the practices included in the randomly selected Department practice notebook and answering questions asked by the teacher about the different practices and the assessment of the practice notebook. The practice mark will account for 10% of the final grade.

ADDITIONAL INFORMATION

It will be an essential condition to pass the subject, both in the continuous assessment and in the only final, to have a minimum grade of 5 points out of 10 in both theoretical and practical teaching. In no case will the marks obtained in the
continuous evaluation in the sections for the realization and presentation of works, assists with achievement or any other evaluable component that appears in the teaching guide, will serve to pass the subject and will only contribute to the final mark of the same. once the theoretical and practical parts have been approved.

The teaching methodology and the evaluation will be adapted to students with specific needs, in accordance with Article 11 of the Regulations for the Evaluation and Qualification of students of the University of Granada, published in the Official Gazette of the University of Granada of November 9, 2016

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

<table>
<thead>
<tr>
<th>TIMETABLE (According to Official Academic Organization Plan)</th>
<th>TOOLS FOR TUTORIALS (Indicate which digital tools will be used for tutorials)</th>
</tr>
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<tbody>
<tr>
<td>Tutorships can be consulted at the following link: <a href="http://www.ugr.es/~fisio/ugr/tutorias.php">http://www.ugr.es/~fisio/ugr/tutorias.php</a></td>
<td>• Videoconference (Google Meet) • E-mail • PRADO forums • Teaching communications</td>
</tr>
</tbody>
</table>

MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY

- Royal Decree-Law 21/2020, of June 9, on urgent measures of prevention, containment and coordination to face the health crisis caused by COVID-19, establishes in its article 9 that in educational centers, including University students must guarantee the adoption of organizational measures, avoid crowds and ensure that a safety distance is maintained, maintaining on campus teaching.
- When it is not possible to maintain this safety distance, adequate hygiene measures will be observed to prevent the risks of contagion. If it is not possible to maintain social distance in the classrooms, each theory group will be divided in two and on campus teaching will be given in alternate weeks to each subgroup while the other subgroup receives teaching via streaming.
- For practical teaching, the explanation of the theoretical foundations may be taught online, while the practical part will subdivide the groups to do it in person in the laboratory, keeping the distance of safety and hygiene measures.

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

Ordinary assessment session

During the 2020-2021 academic year, as indicated in the Regulations for the evaluation and qualification of students of the University of Granada (article 6, point 2), the evaluation will preferably be continuous. The final evaluation tests of the subjects that were foreseen in the teaching guide will preferably be carried out in person, taking into account the level of occupation of the space authorized by the health authorities. The non-face-to-face assessment tests will include mechanisms for guaranteeing their authorship by the students. In any case, adequate legal and security guarantees will always be preserved, with respect for the fundamental rights to intimacy and privacy, observing the principle of proportionality.

Extraordinary assessment session
• Same measures as in the adaptation of the evaluation in ordinary call

**SCENARIO B (ONCAMPUS ACTIVITY SUSPENDED)**

**TUTORIALS**

<table>
<thead>
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<th>TIMETABLE (According to Official Academic Organization Plan)</th>
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</thead>
</table>
| The tutorials are given at the same times that it was done in person. Exceptionally, when this is not possible, the students will have meetings in a new schedule from 2:30 p.m. or 7:00 p.m. In addition, emails are attended to students at any time, for specific questions. | • Videoconference (Google Meet)  
• E-mail  
• PRADO forums  
• Teaching communications |

**MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY**

- **Theoretical Teaching**: classes are held on-line synchronous videoconference through the Google Meet platform at the same times that they had been taught in person
- **Practical Teaching**: students are called through PRADO or teaching communication and a Google Meet link is created to teach these practices.
- Use of the PRADO platform with support material for theory and practices and activities for monitoring continuous assessment.

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

**Ordinary assessment session**

- **Theoretical Teaching**: Online questionnaires through the PRADO-EXAMEN platform. Online questions according to the PRADO-EXAMEN exam modality. The questions are ordered sequentially without being able to go back. The questions are elaborated and carried out through PRADO-EXAMEN. The allocation of points in the evaluation system will be made according to the percentages: 70% of the final grade will be the theoretical exam, 10% the practices and 20% continuous evaluation activities + seminars.
- **Practical Teaching**: Online questionnaires through the PRADO-EXAMEN platform. It will consist of a test (60% of the grade with a structure similar to the theory exam) and the questions from the practical notebook adapted to the new teaching methodology (40% of the grade) that is sent to students in a single file, through PRADO or teaching communication.
- Students who have not completed or have not passed the practices will be called for a practice exam on the day of the theory exam.
- To evaluate both theoretical and practical teaching in the event of a connection failure, another time will be agreed on the same day. In case it fails again, another day will be agreed in the form of individualized online oral test.

**Extraordinary assessment session**
- Online questionnaires through the PRADO-EXAMEN platform
  Online questions according to the PRADO-EXAMEN exam modality. The questions are ordered sequentially without being able to go back. The questions are elaborated and carried out through PRADO-EXAMEN.
- To evaluate both theoretical and practical teaching in the event of a connection failure, another time will be agreed on the same day. In case it fails again, another day will be agreed in the form of individualized online oral test.
- Students who have not completed or have not passed the practices will be called for a practice exam on the day of the theory exam.
- Students will always take a theory test that will be evaluated over 70%. The qualification will be obtained by applying the same criteria specified in the ordinary call.

**Single final assessment**

<table>
<thead>
<tr>
<th>Online questionnaires through the PRADO-EXAMEN platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online questions according to the PRADO-EXAMEN exam modality (70% of the final grade). The questions are ordered sequentially without being able to go back. The questions are elaborated and carried out through PRADO-EXAMEN.</td>
</tr>
<tr>
<td>Students will be called for a practical exam on the day of the theoretical exam (10% of the final grade).</td>
</tr>
<tr>
<td>The allocation of points in the evaluation system will be made according to the percentages: 90% of the final grade will be the theoretical exam (including all the competences) and 10% corresponds to the practices.</td>
</tr>
<tr>
<td>Both to evaluate the theoretical teaching as well as the practical teaching in the event of a connection failure, another time will be agreed on the same day. In case it fails again, another day will be agreed in the form of individualized online oral test.</td>
</tr>
</tbody>
</table>

**ADDITIONAL INFORMATION (if necessary)**

In the event of suspension of on campus teaching, the students of the single final evaluation may request to join virtual teaching, since the difficulties they claimed to not follow the continuous evaluation will have disappeared.