COURSE GUIDE FOR
NAME OF COURSE

Academic year 2020-2021
(Date last update: 08/07/2020)
(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>MEDICINE AND PHARMACOLOGY</td>
<td>HUMAN AND CELL PHYSIOLOGY</td>
<td>2º 1º</td>
<td>6 ECTS (4,5 T + 1,5P)</td>
<td>Obligatory</td>
<td></td>
</tr>
</tbody>
</table>

TEACHING STAFF:

Juan Llopis González (T*; P*)
María López-Jurado (T*; P*)
Julio J. Ochoa Herrera (T*; P*)
Cristina Sánchez González (T*; P*)
José Luis Quiles Morales (T*)
Elena Planells del Pozo (T*)
Iryna Rusanova (T*; P*)
Alfonso Varela López (T*; P*)
Jesús M. Porres Foulquie (T*; P*)
Lourdes Herrera Quintana (T*)
Ana Soriano Lerma (T*)
Mar de la Flor Alemany (T*)
Mª Dolores Navarro Hortal (T*)
José Manuel Romero Márquez (P*)
Hector Vázquez Lorente (T*)
(T*: Teoría; P*: Práctica)

ADDRESS, TELEPHONE NUMBER, EMAIL, ETC.

Dpt. Physiology, 1st floor, Faculty of Pharmacy. 958243879
jllopis@ugr.es; mlopezj@ugr.es; jjoh@ugr.es; crissg@ugr.es; jlquiles@ugr.es; irusanova@ugr.es; alvarela@ugr.es; romeromarquez@ugr.es; jmporres@ugr.es; lourdesherrera@ugr.es; floralemamy@ugr.es; mdnavarro@ugr.es; hectorvazquez@ugr.es; anasoriano@ugr.es

TIMETABLE FOR TUTORIALS OR LINK TO WEBSITE

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

BELONGS TO UNDERGRADUATE DEGREE PROGRAMME

Pharmacy

AND ALSO TO OTHER UNDERGRADUATE DEGREE PROGRAMMES

Medicine, Logopedía, Biología, Enfermería, Fisioterapia, Nutrición, Food Technology, Terapia Ocupacional, Ciencias de la Actividad Física y el Deporte

PREREQUISITES OR RECOMMENDATIONS (where applicable)

Recommendations: to have previous basic knowledge (background knowledge of Chemistry, Anatomy and Histology, Biochemistry, Metabolism. A good standard of English and informatics skills are also required.

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/)

1
**BRIEF DESCRIPTION OF CONTENT (ACCORDING TO OFFICIAL VALIDATION REPORT)**


**GENERAL AND SPECIFIC COMPETENCES**

GC9. - To intervene in the activities of promotion of health, prevention of disease, in the individual, familiar and community area with an integral and multiprofessional vision of the process health and disease.

GC13. - To develop skills of communication and information, both oral and written, to deal with patients and users of the center where it is developed the professional activity. To promote the capacities of work and collaboration in multidisciplinary teams and those related to other sanitary professionals.

GC15. - To recognize the own limitations and the need to support and update the professional competences, giving special importance to the autolearning of new knowledge being based on the scientific available evidence.

EC47. - To know and to understand the structure and function of the human body, as well as the general mechanisms of the disease, molecular, structural and functional alterations and therapeutic tools to restore the health.

**OBJECTIVES (EXPRESSED AS EXPECTED LEARNING OUTCOMES)**

The above mentioned objectives in this area are focus on promote that the future pharmacist acquires knowledge about the functioning of the human organism. To do so:

- Understanding the physiological processes, analyzing their biological meaning, description, regulation and integration at different levels of organization: cell, organ and body systems in health.

- Establish the basis for understanding the physiological adaptation process taking place due to a continuously changing environment.

**DETAILED SYLLABUS**

**THEORY:**

| Subject 1. | Introduction to Physiology |
| Subject 2. | Functional organization of the cell. Plasma membrane |
| Subject 3. | Transport across the plasma membrane |
| Subject 4. | Excitability |
| Subject 5. | Nerve cells |
| Subject 6. | Synaptic transmission |
| Subject 7. | The muscle fiber |
| Subject 8. | General structure of the nervous system |
| Subject 9. | General physiology of receptors |
| Subject 10. | Somato-visceral sensitivity |
| Subject 11. | Physiology of vision |
| Subject 12. | Physiology of hearing and balance |
| Subject 13. | Physiology of taste and smell |
| Subject 14. | Control of motor activity I. Motor function in the spinal cord and brainstem |
| Subject 15. | Control of motor activity II. Motor function in the cerebellum, basal ganglia and cortex |
| Subject 16. | Higher functions of the nervous system |
| Subject 17. | General organization of the endocrine system |
| Subject 18. | Neuroendocrine integration |
| Subject 19. | Thyroid physiology |
| Subject 20. | Hormonal regulation of metabolism calcium/phosphorus |
| Subject 21. | Hormonal regulation of growth |
Subject 22. Physiology of the endocrine pancreas
Subject 23. Physiology of the adrenal gland Subject 24. Hormonal regulation of water-salt balance

Laboratory practice program
Practice 1. - Detailed functional study of different organs and body systems models
Practice 2. - Transport mechanisms and cell permeability (computer simulation)
Practice 3. - Neurophysiology of nerve impulses (computer simulation)
Practice 4. - Gustatory and olfactory receptors.
Practice 5. - Skeletal Muscle Physiology (simulated).
Practice 6. - Effect of thyroxine on the basal metabolism (computer simulation)
Practice 7. - Control of blood glucose. Determining the blood glucose curve

For each academic year, a selection of the above list will be performed at the physiology laboratory.

BIBLIOGRAPHY

Print Books on Physiology

Print Journals
☐ News in Physiological Sciences
☐ Physiological Review
☐ Current Advances in Physiol
☐ Annual Review of Physiology

RECOMMENDED LINKS
http://www.the-aps.org/ The American Physiological Society
http://physioc.org/ The Physiological Society
http://www.seccff.org/ Sociedad Española de Ciencias Fisiológicas
Página 4 http://www.feps.org/ Federación Europea de Sociedades de Fisiología
TEACHING METHODOLOGY

The contents of the program will be developed through a combination of teaching techniques.

Theoretical classes
The theoretical topics will be presented in the classical way through master classes on the different sections that make up the subject.
A proposal will be made for consultation sources (texts, published works, specialized magazines, web page addresses, etc.), in which to search for information on the various topics of the program.

Seminars and other continuous training activities
Class exposition of 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 exposition, 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.
Carrying out other self-employment activities and, in general, continuous assessment activities. The use of the teaching platform of the University of Granada is recommended.

Tutoring
Periodic meetings in specific tutorials to resolve doubts raised by the students.

Practical classes
It is an indispensable condition to have passed the laboratory practices to be able to pass the subject. The practices are one-call. Students who do not attend for just cause must notify the practice coordinator immediately.
They will be carried out in the laboratories of the Department of Physiology in the morning or afternoon and will be announced on the notice board of the Department, adjusting to the calendar proposed by the Faculty.
The teacher 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. 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 teacher and will be returned to the student with the corresponding grade.

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.
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, 2017.

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)

TUTORIALS

<table>
<thead>
<tr>
<th>TIMETABLE</th>
<th>TOOLS FOR TUTORIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(According to Official Academic Organization Plan)</td>
<td>(Indicate which digital tools will be used for tutorials)</td>
</tr>
<tr>
<td>The tutoring and attention to the students, both individually and collectively, will be carried out in person or by telematic means at the time established for this in this guide (prior appointment is recommended).</td>
<td>• Videoconference (Google Meet or Zoom)</td>
</tr>
<tr>
<td></td>
<td>• E-mail</td>
</tr>
<tr>
<td></td>
<td>• PRADO forums</td>
</tr>
<tr>
<td></td>
<td>• 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.

- In the event that in the classroom it is possible to maintain a safety distance of at least 1.5 meters between the occupants, the sessions will be entirely in-person.
- 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.
- In relation to experimental teaching, the explanation of the theoretical foundations may be taught online, while for the practical part, the groups will be subdivided to be carried out through in-person teaching in the laboratory. Safety and hygiene measures will be maintained.

### 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 by a continuous assessment method.

- The final evaluation tests of the subjects that were foreseen in the teaching guide will preferably be carried out as face-to-face assessment, 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. Respect for the fundamental rights to intimacy and privacy will be observed, according to the principle of proportionality.

#### Extraordinary assessment session

Same measures as in the adaptation of the evaluation in ordinary call will apply.

#### Single final assessment

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, 2017.

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 case will the marks obtained in the continuous evaluation in the sections for the realization and presentation of works, assist 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 B (ONCAMPUS ACTIVITY SUSPENDED)

<table>
<thead>
<tr>
<th>TUTORIALS</th>
<th>TOOLS FOR TUTORIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIMETABLE (According to Official Academic Organization Plan)</td>
<td>(Indicate which digital tools will be used for tutorials)</td>
</tr>
<tr>
<td>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.</td>
<td>• Videoconference (Google Meet or Zoom)</td>
</tr>
<tr>
<td></td>
<td>• E-mail</td>
</tr>
<tr>
<td></td>
<td>• PRADO forums</td>
</tr>
<tr>
<td></td>
<td>• Teaching communications</td>
</tr>
</tbody>
</table>

MEASURES TAKEN TO ADAPT TEACHING METHODOLOGY

**Theoretical Teaching:** classes are held on-line synchronous videoconference through the Google Meet or Zoom 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.

The use of the PRADO teaching platform with support material for theory, practices and activities for monitoring continuous assessment is recommended.

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 specific connection failure affecting a few students, 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 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%. In relation to the rest of the sections, the students will be able to keep their mark (practices, seminar and continuous evaluation questions). The final qualification will be obtained by applying the same criteria specified in the ordinary call.
- To evaluate both theoretical and practical teaching in the event of a specific connection failure affecting a few students, 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.

**Single final assessment**

- Online questionnaires through the PRADO-EXAMEN platform
  The questions are ordered sequentially without being able to go back. The questions are elaborated and carried out through PRADO-EXAMEN. A Google Meet or Zoom session could also be used.
  
  The distribution of points in the final qualification will be done according to the principles:
  - Students will be called for a practical exam on the day of the theoretical exam (10% of the final grade).
  - Evaluation of theoretical contents will be 90%: 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.
  - To evaluate both theoretical and practical teaching in the event of a specific connection failure affecting a few students, 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.

**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.