<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>Formation complements: OPTIONAL SUBJECT</td>
<td>Human organism alterations: functional tests</td>
<td>$4^{th}$</td>
<td>$2^{nd}$</td>
<td>6 ECTS ($4.5\ T + 1.5\ P$)</td>
<td>Optional. 2 groups semivirtuals</td>
</tr>
</tbody>
</table>

**TEACHING STAFF**

- José Luis Quiles Morales (T*; P*)
- Miguel Moreno Prieto (T*; P*)
- Mª Teresa Nestares Pleguezuelo (T*; P*)
- Virginia Aparicio-García de Molina (T*)

(T*: Theoretical; P*: Practical)

**ADDRESS, TELEPHONE NUMBER, EMAIL, ETC.**

Dpto. Fisiología, 1ª planta, Facultad de Farmacia. 958243879.
jlquiles@ugr.es mgmoreno@ugr.es nestares@ugr.es virginiaparicio@ugr.es

**TIMETABLE FOR TUTORIALS OR LINK TO WEBSITE**

**J.L. Quiles Morales:** First and second four-month period: Mo:8.00 a.m.-14.00 p.m.
Dpto. Fisiología.

**M. Moreno Prieto:** First four-month period: Mo. 17.00-19.00 p.m.; W. and F. 12.00-14.00 p.m. Second four-month period: Tu. y Th. 11.30a.m.-13.30p.m.; F. 16.00-17.00 y 18.00-19.00 p.m. Dpto. Fisiología.

**M.T. Nestares Pleguezuelo:** First and second four-month period: Tu. and Th. 9.30 a.m.-12.30p.m. Dpto. Fisiología.

**V.A. Aparicio García-Molina:** First and second four-month period: Mo., W. and F. 16.00-18.00 p.m. Dpto. Fisiología.

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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/)
<table>
<thead>
<tr>
<th><strong>BELONGS TO UNDERGRADUATE DEGREE PROGRAMME</strong></th>
<th><strong>AND ALSO TO OTHER UNDERGRADUATE DEGREE PROGRAMMES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Grado</em> in Pharmacy</td>
<td><em>Grado</em> in biology, biochemistry, medicine, nursing and nutrition</td>
</tr>
</tbody>
</table>

**PREREQUISITES OR RECOMMENDATIONS** (where applicable)

It is recommended to have previous basic knowledge (background knowledge of Basic Principles of Chemistry, Physic Applied to Pharmacy, Physic-Chemistry, Human Anatomy and Histology, Structural Biochemistry, Metabolic Biochemistry, Human and Cell Physiology (I and II), Physiopathology. A good standard of English and computer skills are also required.

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

Its study functional tests to evaluate the normal functioning of the systems: Endocrine, Reproductive, Cardiocirculatory, Respiratory, Excretory and Acid-Base Balance Maintenance, Digestive System and Nervous System

**GENERAL AND SPECIFIC COMPETENCES**

**GENERIC SKILLS:**

- CG10. - To design, to devote and to evaluate reagents, methods and analytical clinical technologies, knowing the basic foundations of the clinical analyses and the characteristics and contents of the judgments of laboratory diagnostics.
- HUMAN ORGANISM ALTERATIONS: FUNCTIONAL TESTS
- SUBJECT GUIDE Academic year 2019-2020
- Página 2
- CG13. - To develop communication and information skills, both oral and written, to treat with patients and users of the Center where it recovers his professional activity. To promote the capacities of work and collaboration in multidisciplinary equipments and the related ones to other sanitary professionals.

**SPECIFIC SKILLS:**

- CE37. - To develop hygienic-sanitary analyses (biochemical, bromatological, microbiological, parasitological) related to the health in general and with the food and environment especially.
- CE47. - 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, syndromic expression and therapeutic tools to restore the health.
- CE49. - To know the analytical Technologies related to diagnosis of laboratory, toxins, food and environment.

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

The acquired knowledge will allow to know and to differentiate the tests that are realized for the concrete diagnosis of an alteration of the organism. The advantages and disadvantages will be known of each one of these tests as well as the limitations and interpretation of results. The learning, therefore, will allow to determine the test of choice for every
alteration. Hereby there complements each other the knowledge acquired in the subjects of Human and Cell Physiology I and the II, Physiopathology and Clinics Physiology and Biochemistry.

DETAILED SYLLABUS

THEORY PROGRAM (Present Hours)

BLOQUE 1 ENDOCRINE SYSTEM (3,5 H)

Thematic Unit 1. - Generalities exploration endocrine system
Thematic Unit 2. - Regulation of corporal liquid volumes: exploration of ADH and aldosterone
Thematic Unit 3. - Exploration of hiperglycemic syndrome: diabetes mellitus
Thematic Unit 4. - Functional exploration of Ca and P metabolism
Thematic Unit 5. - Functional study of growth hormone secretion
Thematic Unit 6. - Thyroid function tests
Thematic Unit 7. - Exploration of cortico-suprarrenal function

BLOQUE 2 REPRODUCTIVE SYSTEM (1,5 H)

Thematic Unit 1. - Tests to evaluate the male reproductive system
Thematic Unit 2. - Tests to evaluate the female reproductive system

BLOQUE 3 CARDIOCIRCULATORY SYSTEM (5 H)

Thematic Unit 1. - Functional exploration of cardiac cycle
Thematic Unit 2. - Functional evaluation of cardiac electrical activity: electrocardiogram
Thematic Unit 3. - Functional evaluation of peripheral vascular system

BLOQUE 4 RESPIRATORY SYSTEM (2,5 H)

Thematic Unit 1. - Study of pulmonary ventilation
Thematic Unit 2. - Study of alveolar-capillary diffusion

BLOQUE 5 EXCRETORY SYSTEM AND ACID-BASE BALANCE (2,5 H)

Thematic Unit 1. - Functional tests of renal system
Thematic Unit 2. - Tests to evaluate acid-base balance

BLOQUE 6 DIGESTIVE SYSTEM (2,5 H)

Thematic Unit 1. - Tests to evaluate tube digestive motility
Thematic Unit 2. - Tests to evaluate digestion and absorption
Thematic Unit 3. - Tests to evaluate hepatic function

BLOQUE 7 NERVOUS SYSTEM (2,5 H)

Thematic Unit 1. - Functional study of nervous system I: exploration, analytical techniques and image analysis
Thematic Unit 2. - Functional study of nervous system II: electrophysiological study of nervous system
LABORATORY PRACTICE PROGRAM

Practice 1. - Electrocardiography in humans.
Practice 2. - Spirometry in humans. Pulse oximetry.
Practice 3. - Study of metabolic syndrome.
Practice 4. - Indirect calorimetry

BIBLIOGRAPHY

BASIC READING LIST

COMPLEMENTARY READING

RECOMMENDED LINKS

Nervous system
http://ineurociencias.ugr.es/
http://www.ugr.es/
www.bioon.com/bioline/neurosci/course/index.htm

Muscular system
Muscle Physiology - Introduction to Muscle
http://ortho84-13.ucsd.edu/musintro/jump.shtml
http://www.biology-pages.info/M/Muscles.html

Respiratory system
Interpreting Spirometry http://www.vh.org/Providers/Simulations/Spirometry/InterpSpiro.html

Cardiovascular system
http://depts.washington.edu/physdx/heart/demo.html
http://www.wilkes.med.ucla.edu/Physiology.htm
http://www.blaufuss.org/

Digestive system
GI TRACT http://www.pathguy.com/lectures/guts.htm
**Excretory system**

**Endocrine system**
GraphPad Radioactivity Calculator [http://www.graphpad.com/www/radcalc.htm](http://www.graphpad.com/www/radcalc.htm)

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**TEACHING METHODOLOGY**

- This subject is taught in two blended groups.
- The blended methodology consists of the following: This subject of the second semester will be taught between the months of February and May. 40% of the classes will be virtual, which the student will distribute as best they can to access the syllabus, make inquiries by mail, comment on the forum, carry out the activities, etc. The remaining 60% will be face-to-face classes and will be distributed throughout the course according to the indications that will be made available to students through the Prado2 platform in due course.
- With the Calendar tool, this timing will be reinforced and all the changes that appear will be announced.
- The face-to-face classes will allow you to acquire general knowledge of each topic and resolve common doubts. The practices will be carried out in the department laboratory. It will be necessary to present a report with the results obtained.
- There will also be specific activities with a specific date and time, such as Chat, or with greater participatory flexibility, such as forums. Consequently, the active and participative attitude of the virtual student will repel in a greater enrichment and use of the learned knowledge.
- Chat: for online explanations of topics and clarification of doubts.
- Forums: when it comes to topics of general interest and proposed by both teachers and students.
- Tutorials: both in person via email, or in person, as a group on topics or questions asked individually but of general interest that can be posted on the platform with access to everyone.
- Control of student participation by consulting the time they have been reviewing the material and the schedule for its completion.
- Attendance at face-to-face classes will be counted.

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

To evaluate the contents of the subject, periodic evaluation controls will be carried out on dates set by the Faculty. Before the date of each control, the teacher will explain the type of exam in class or through the platform.
There will also be an evaluation of regular attendance, with use, to face-to-face activities scheduled throughout the course.
Participation in the platform will be evaluated, through the different modalities previously proposed, as well as carrying out the activities included in each of the blocks of the subject.
For the evaluation of the laboratory practices, the students will have to present a memory prepared with the results and their discussion, obtained during the activities in the laboratory.

The allocation of points in the evaluation system will be made according to the percentages:
- 65% final face-to-face exam
• 20% practical
• 10% periodic activities
• 5% participation in the platform and attendance to face-to-face classes

IMPORTANT NOTE: Having passed the laboratory practices is an essential condition to pass the course. Students who do not pass the practices will be eligible for a new evaluation that will be carried out before or coinciding with the theoretical exam of the official call (ordinary / extraordinary).

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)

TUTORIALS

<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>
</thead>
<tbody>
<tr>
<td>The tutoring and attention to the students,</td>
<td>• Videoconference (Google Meet or Zoom)</td>
</tr>
</tbody>
</table>

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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).

- E-mail
- PRADO forums
- Teaching communications

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, 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 B (ONCAMPUS ACTIVITY SUSPENDED)**

<table>
<thead>
<tr>
<th>TUTORIALS</th>
<th>TIMETABLE (According to Official Academic Organization Plan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOOLS FOR TUTORIALS (Indicate which digital tools will be used for tutorials)</td>
<td></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)</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 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 n** (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: 65% final face-to-face exam; 20% practical, 10% periodic activities, 5% participation in the platform and attendance to face-to-face classes.

- **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.

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**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 will always take a theory test that will be evaluated over 65%. 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.

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**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.

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**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.