

MODULE	SUBJECT MATTER	YEAR	SEMESTER	CREDITS	TYPE
BASIC COMMON KNOWLEDGE	HUMAN AND CELL PHYSIOLOGY	2 nd	2 nd	6 ECTS	Obligatory
TEACHING STAFF ⁽¹⁾			ADDRESS, TELEPHONE NUMBER, EMAIL, ETC. DIRECCIÓN COMPLETA DE CONTACTO PARA TUTORÍAS (Dirección postal, teléfono, correo electrónico, etc.)		
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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/ngc7121/>)

	TIMETABLE FOR TUTORIALS OR LINK TO WEBSITE
	https://www.ugr.es/~fisiougr/tutorias.php
BELONGS TO UNDERGRADUATE DEGREE PROGRAMME	AND ALSO TO OTHER UNDERGRADUATE DEGREE PROGRAMMES
<i>Degree in Physical Activity and Sport Science</i>	Pharmacy, Medicine, Speech Therapy, Nursing, Physiotherapy, Nutrition, Food Technology, Occupational Therapy.
PREREQUISITES OR RECOMMENDATIONS (where applicable)	
<p>Prerequisites: those necessary to access to the degree, related with the level of formation that the student must acquire to accede to the University.</p> <p>Recommendations: to have previous basic knowledge (background knowledge of Chemistry, Anatomy and Histology, Biochemistry, Metabolism.</p> <p>A good standard of English and informatics skills are also required.</p>	
BRIEF DESCRIPTION OF CONTENT ACCORDING TO OFFICIAL VALIDATION REPORT	
<p>The programme has a high degree of coherence and integration and cover a diverse range of topics, while reflecting particular strengths within the biological and life sciences and there is a clear coherence between the different modules. Physiology is a study of the normal functions of cells, organs and systems of the living body, the mechanisms by which they are achieved and the regulation of functional activities to maintain the homeostasis, therefore the programme has been divided into thematic units just for didactic purposes, but during the course we will integrate all the body systems defining their links to maintain the homeostasis.</p> <p>1. Program Theory</p> <p>Thematic Unit I: Introduction and cell Physiology</p> <p>Thematic Unit II: Nervous System</p> <p>Thematic Unit III: Body Fluids and Blood.</p> <p>Thematic Unit IV: Endocrine System</p> <p>Thematic Unit V: Cardiovascular System</p> <p>Thematic Unit VI: Respiratory System</p> <p>Thematic Unit VII: Renal System</p> <p>Thematic Unit VIII: Digestive System</p> <p>Thematic Unit IX: Reproductive System</p> <p>2. Program Practic</p>	



Practice 1. Detailed functional study of different organs and body systems models.

Practice 2. Blood cell count and morphology by mean of the optical microscope.

Practice 3. Determination of hemoglobin and hematocrit. Automatic counting of leukocytes and erythrocytes

Practice 4. Blood Pressure assessment. Glucemic profile.

Practice 5. Respiratory system assessment by mean of spirometry

GENERAL AND SPECIFIC COMPETENCES

Physiology is a study of the normal functions of cells, organs and systems of the living body, the mechanisms by which they are achieved and the **regulation of functional activities**. A firm grasp of its principles is essential not only for the study of successive courses, but also for students' future professional career after graduation. Selection of the teaching material will be in accordance with the necessity of professional education and will be laid emphasis on basic theories and knowledge of physiology as well as on the training of basic techniques. **Attention will also be paid to promote the ability of scientific thinking** of the students. In order to foster the students' ability of studying physiology, we conduct our teaching with several methods, such as self-study, exhibition in small groups and tutoring instead of to be given only by lecturer in the classroom. The lifelong learning to obtain more and better competences requires new pedagogical practices and the emergence of new scenarios for the students in where **multimedia shall play a predominant role** in our programme. Therefore, multimedia resources will be using our methodological teaching-learning process in the classroom. **Cooperative learning networks will be built and innovative teaching-learning strategies will be used to complement the traditional classes.**

OBJECTIVES (EXPRESSED AS EXPECTED LEARNING OUTCOMES)

General Disciplinary Competencies:

1. Apply the biological, mechanical, behavioral and social principles to the different professional exits: Training, Education, Health, Management and Recreation.

Specific Disciplinary Competences:

Education sector

- To design, develop and evaluate the teaching / learning processes related to physical activity and sport with attention to the individual and contextual characteristics of the people.

Scope Sports Training:

- Apply the physiological, biomechanical, behavioral and social principles, during the direction of the sports training.

DETAILED SYLLABUS

We will use **several multimedia instruments during the course** to enhance the teaching-learning process of the student. This programme has been designed taking into account the integration concept and **cover a diverse range of physiological topics, with a clear coherence between the different modules**. Physiology is a study of the normal functions of cells, organs and systems of the living body, the mechanisms by which they are achieved and the regulation of functional activities to maintain the homeostasis, therefore the programme has been divided into thematic unit just for didactic purposes, although during the course we will integrate all the body systems, to understand better how they maintain a stable, constant condition.



Program theory (with aims and time schedule)

THEMATIC UNIT I: INTRODUCTION AND CELL PHYSIOLOGY

Subject 1. - Introduction to Physiology (0,5h)

Subject 2. - Functional organization of the cell (Plasma membrane). Transport across the plasma membrane (1h)

Subject 3. – Resting membrane potential and action potential. Excitability (1,5h)

THEMATIC UNIT II: NERVOUS SYSTEM

Subject 4. - Nerve cells. Synaptic transmission (1,5 h)

Subject 5. - General structure of the nervous system (1h)

Subject 6. - General physiology of receptors (1h)

Subject 7. Physiology of sensory organs (2h)

Subject 8. – Control Motor Activity (1h)

Subject 9.- Autonomic Nervous System (1h)

Subject 10. - Higher functions of the nervous system (1h)

Subject 11. Skeletal and visceral muscle physiology (1,5 h)

THEMATIC UNIT III: BODY FLUIDS AND BLOOD

Subject 12. Body Fluids. The blood (1 h)

Subject 13. Physiology of the erythrocyte and leukocyte (1h)

Subject 14. Platelet physiology and hemostasis (1h)

THEMATIC UNIT IV: ENDOCRINE SYSTEM

Subject 15. General organization of the endocrine system. Neuroendocrine Integration (1,5h)

Subject 16. Thyroid physiology (1h)

Subject 17. Hormonal regulation of protein metabolism and growth (1,5h)

Subject 18. Hormonal regulation of both glycemic and lipid metabolism (1,5h)

Subject 19. Hormonal regulation of water-salt balance (1h)

Subject 20. Hormonal regulation of metabolism calcium/phosphorus (1h)

THEMATIC UNIT V: CARDIOVASCULAR SYSTEM

Subject 21. Functional Anatomy of the Heart. Myocardial properties. Electrocardiogram. (1h)

Subject 22. Cardiac cycle. Cardiac output and factors affecting it. (1,5h)

Subject 23. General circulation and microcirculation. (2h)

Subject 24. Cardiovascular regulation. (1h)



THEMATIC UNIT VI: RESPIRATORY SYSTEM

Subject 25. - Morphofunctional structure of the respiratory system. Mechanical ventilation. (1.5h)

Subject 26. - Exchange and transport of respiratory gases. (1h)

Subject 27. - Regulation of respiration. (1h)

THEMATIC UNIT VII: RENAL SYSTEM

Subject 28. - Morphological-functional structure of the excretory system. The nephron. (1h)

Subject 29. - Mechanisms of urine formation. (1h)

Subject 30. Regulation of acid-base balance. (1h)

THEMATIC UNIT VIII: DIGESTIVE SYSTEM

Subject 31. Functional structure of the digestive tract. Smooth muscle. Motility of the alimentary tract (1h)

Subject 32. Digestive Secretions (1h)

Subject 33. Digestion and absorption (1h)

THEMATIC UNIT IX: REPRODUCTIVE FUNCTION

Subject 34. Morphologic and functional structure of the reproductive system (1.5h).

Subject 35. Physiology of fecundation, pregnancy, childbirth and lactation (1h)

LABORATORY PRACTICE PROGRAM

Practice 1. Detailed functional study of different organs and body systems models. (3h)

Practice 2. Blood cell count and morphology by mean of the optical microscope. (3h)

Practice 3. Determination of hemoglobin and hematocrit. Automatic counting of leukocytes and erythrocytes (3h)

Practice 4. Blood Pressure assessment. Glycemic profile. (3h)

Practice 5. Respiratory system assessment by mean of spirometry (3h)

BIBLIOGRAPHY

GENERAL BIBLIOGRAPHY:

Print Books:

- LIBROS DE TEXTO:



UNIVERSIDAD
DE GRANADA

- CORDOBA, A. "Fisiología Dinámica". Barcelona: Ed. Masson, 2003.
- COSTANZO, L.S. Fisiología. 5ª edición. Madrid: Ed. Elsevier, 2014.
- COSTANZO, L.S. Temas Clave Fisiología. 4ª edición. Barcelona: Ed. Wolters Kluwer, 2007
- DVORKIN, M.A. and CARDINALI, D.P. Best & Taylor: Bases Fisiológicas de la Práctica Médica. 14ª edición. Ed. Médica Panamericana, 2010.
- LÓPEZ CHICHARRO, J., FERNÁNDEZ VAQUERO, A. Fisiología del Ejercicio. 3ª Edición. Madrid, Ed. Médica Panamericana, 2008.
- FOX, S. I. Fisiología Humana. 13ª edición. Aravaca (Madrid): Ed. Mc Graw-Hill-Interamericana, 2014.
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- GUYTON, A.C. and HALL, J.E. Tratado de Fisiología Médica. 13ª edición. Madrid: Ed. Elsevier, 2016.
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- ROBERT M. BERNE; MATTHEW N. LEVY. Fisiología. 7ª edición. Madrid: Elsevier Mosby; 2018.
- RHOADES, R. and BELL, D. Fisiología Médica: Fundamentos de medicina clínica, 4ª edición. Barcelona: Ed. Lippincott Williams And Wilkins. Wolters Kluwer Health, 2012.
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- TRESGUERRES, J.A.F. y otros, Fisiología Humana. 4ª edición. Madrid: Ed. Interamericana-McGraw-Hill, 2011.
- TORTORA, G.J. and DERRICKSON, B. Principios de Anatomía y Fisiología. 13ª edición. Ed. Médica Panamericana. 2013.
- TORTORA, G.J. and DERRICKSON, B. Introducción al Cuerpo Humano. 7ª edición. Ed. Médica Panamericana. 2008.
- WILMORE, J.H., COSTILL, D.L. Fisiología del Esfuerzo y el Deporte. 6ª Edición. Barcelona, Ed. Paidotribo, 2007.

Dictionary and Atlas:

- Diccionario médico. 4ª edición. Barcelona. Editorial Masson, 2005.
- Diccionario médico ilustrado Harper Collins de bolsillo. Editorial Marban, 2005.
- CASSAN, A. Atlas Básico de Fisiología. Ed. Parramón, 2003
- JACOB, S. Atlas de Anatomía Humana. Ed. Elsevier, 2002
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- THE MOSBY PHYSIOLOGY MONOGRAPH SERIES. 5ª edición. Renal Physiology (2012), Cardiovascular Physiology (2012), Gastrointestinal Physiology (2012), Endocrine Physiology (2012), Respiratory Physiology (2012). Ed. Mosby Elsevier.
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- WILLIAMS, W.J. Manual de Hematología. 8ª edición. Madrid: Ed Mc Graw Hill 2016.

PERIODIC PUBLICATIONS

- News in Physiological Sciences Physiological (<https://www.ncbi.nlm.nih.gov/labs/journals/news-physiol-sci/>)
- Physiological Review (<https://www.physiology.org/journal/physrev>)
- Current Opinion in Physiology (<https://www.journals.elsevier.com/current-opinion-in-physiology>)
- Annual Review of Physiology (<https://www.annualreviews.org/journal/physiol>)
- Journal of Physiology (<https://physoc.onlinelibrary.wiley.com/journal/14697793>)
- American Physiological Society Journal (<https://www.physiology.org/>)

MANUALS OF PRACTICE

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RECOMMENDED LINKS

<https://www.dailymotion.com/video/xgsbsj>
<https://www.google.com/search?q=videos+fisiolog%C3%ADa&ie=utf-8&oe=utf-8&client=firefox-b>
http://www.youtube.com/results?search_query=fisiolog%C3%ADa&oq=fisiolog%C3%ADa&gs_l=youtu-be-reduced.3..0l4.2430.4096.0.4578.10.8.0.2.2.0.173.642.5j3.8.0...0.0...1ac.a47BoB4QuMs (vídeos Fisiología)
<http://tu.tv/tags/fisiologia/> videos de fisiología
<http://www.youtube.com/watch?v=L5T81uMVR44> (Sistema Nervioso)
<http://muscle.ucsd.edu/musintro/Jump.shtml> (Sistema Muscular)
<http://www.youtube.com/watch?v=dVidTJ4Wjs&feature=related> (Sangre)
<http://www.youtube.com/watch?v=8af1Cpustf0&feature=related> (Coagulación)
<http://arbl.cvmbs.colostate.edu/hbooks/pathphys/endocrine/index.html> (endocrinología)
<http://www.youtube.com/watch?v=aQZaNXNroVY&feature=related> (Sistema Renal)
<http://www.youtube.com/watch?v=URHB3RKEs&feature=fvsr> (Sistema digestivo)
<http://www.youtube.com/watch?v=HiT621Prr00&feature=related> (Sistema Respiratorio)
http://www.youtube.com/results?search_query=Sistema+Cardiovascular&oq=Sistema+Cardiovascular&gs_l=youtu-be-reduced.3..0l4.10418.14237.0.14404.22.13.0.9.9.1.154.1399.4j9.13.0...0.0...1ac.JWsGUPeTe0 (Sistema Cardiovascular)

Sociedades científicas con webs educativas y webs generalistas



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<http://www.the-aps.org/> The American Physiological Society
<http://physoc.org/> The Physiological Society
<http://www.secf.es/> Sociedad Española de Ciencias Fisiológicas
<http://www.feps.org/> Federación Europea de Sociedades de Fisiología

TEACHING METHODOLOGY

I. Continuous Assessment

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 class and class activities: 20%

A minimum mark (indicated by the professor at the beginning of the course) in both the theory and laboratory practice sections must be obtained in order to pass the subject.

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

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

According to the Students Assessment and Qualification Policy of the University of Granada (adopted by the Governing Council on Oct 26, 2016), those students who cannot follow the continuous assessment system due to working, health or disability issues (or any other reason appropriately justified) can apply for a Single Final Assessment. For this purpose, the student will submit a formal request to the Director (Head) of the Department, arguing and proving (with documented evidence) the reason for not being able to follow the continuous system. The submission deadline will be 2 weeks after the beginning of the lectures. In extraordinary circumstances, the starting date for counting the 2-week period will be the enrolment date (policy NCG78/9) and, in this case, the student will have to include the proof of enrolment date when making the request. After ten days without the student receiving a written reply from the Director of the Department, it will be understood that the request has been deemed. In case of denial, the student may file, within one month, an appeal to the Rector, who may delegate this task to the Dean or Director of the Centre, exhausting the administrative proceedings.

For students in the Single Final Assessment system, the final mark will be calculated according to the following:

Theory: 90%



Laboratory practice: 10%

SCENARIO A ON-CAMPUS AND REMOTE TEACHING AND LEARNING COMBINED

TUTORIALS

TIMETABLE

(According to Official Academic Organization Plan)

TOOLS FOR TUTORIALS

(Indicate which digital tools will be used for tutorials)

- Videoconference (Google Meet)
- 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.
- 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

To evaluate the contents of the subject, periodic evaluation controls will be carried out on dates set by both the teaching staff (first control) and the Faculty (second and final exam). Before the date of each control, the teacher will explain the type of exam in class. There will also be an evaluation of the work done and presented by the students in class, as well as regular attendance with use of the face-to-face activities scheduled throughout the course. In order to pass the course, it will be essential to have passed the laboratory practices and the theory controls. The allocation of points in the evaluation system will be made according to the percentages:

- Theoretical classes: 70%
- Completion of laboratory practices: 10%
- Presentation of topics by the students and / or completion of work and attendance with use of class: 20%

Assessment of theoretical content:

- Students will be evaluated continuously throughout the semester by completing a maximum of 2 controls, including the final exam (inside or outside of class time), which may be subject eliminatory. The matter will be eliminated, until the ordinary call, as long as the controls have a score equal to or greater than 5 points. The theoretical subject will account for 70% of the final grade.



Evaluation of the work carried out and exhibited by the students:

- At the beginning of the course, a series of subjects will be distributed among the students and the approximate date of their presentation in class will be set. Each work will be evaluated in its contents, exposition and defense of the subject. In addition to the presentation, the students in charge of carrying out the work must prepare a summary that will serve the rest of the class to study the topic. Some topics will be prepared by all students and will be discussed later in class. The content of the works will also be part of the subject to be evaluated in the written tests. The completion of work will account for 10% of the final grade.

Evaluation of regular attendance with use of face-to-face activities scheduled throughout the course:

- The evaluation of class attendance with achievement will be carried out by means of small tests at the end of some of the theoretical classes. This system, which will be carried out randomly and without warning, has the purpose of controlling the student's attendance at class, mandatory in the current context.

Laboratory practice evaluation:

- To pass, attendance is compulsory and students must present a notebook with the results obtained during the course. Students who do not pass the practicals will be able to take a new practical exam that will be held before or coinciding with the theoretical exam of the official call (ordinary / extraordinary).

Extraordinary assessment session

Students will always take a theory test that will be evaluated over 70%. In the rest of the sections, the students will be able to keep their mark or waive the mark of all the sections (practices, seminar and continuous evaluation questions) and be re-evaluated of all of them if they so request. The qualification that will appear in the minutes will be obtained by applying the same criteria specified in the ordinary call

Single final assessment

SCENARIO B (ONCAMPUS ACTIVITYSUSPENDED)

TUTORIALS

TIMETABLE

(According to Official Academic Organization Plan)

TOOLS FOR TUTORIALS

(Indicate which digital tools will be used for tutorials)

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%. In the rest of the sections, the students will be able to keep their mark or waive the mark of all the sections (practices, seminar and continuous evaluation questions) and be re-evaluated of all of them if they so request. The qualification will be obtained by applying the same criteria specified in the ordinary call.

Single final assessment

- Online questionnaires through the PRADO-EXAMEN platform
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.
- Students will be called for a practical exam on the day of the theoretical exam (10% of the final grade).
- 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 (those who pass the test must also pass an oral exam the same day through Google Meet to complete the grade up to 90%) and 10% corresponds to the practices.
- 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.



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.

It will be an essential condition to pass the subject, both in the continuous evaluation 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, assistances with achievement or any other evaluable component that appears in the teaching guide, will serve to pass the course and will only contribute to the final mark of the same. once the theoretical and practical parts have been approved.

