

Medical Physiology I

Code: 102957
ECTS Credits: 8

Degree	Type	Year	Semester
2502442 Medicine	FB	2	1

Contact

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Teaching groups languages

You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject. Please note that this information is provisional until 30 November 2023.

Teachers

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Prerequisites

To take Medical Physiology I subject, students are recommended to have acquired the basic knowledge and competence on the structure and organization of the human body and its body systems, particularly in the subjects of Cell Biology, Biochemistry and Molecular Biology, and Biophysics. It is also necessary to have completed and achieved the basic knowledge and competence of the General Physiology subject of the first year.

Objectives and Contextualisation

The Medical Physiology I subject is programmed during the second semester of the second year of the Degree of Medicine and develops the knowledge of the normal function of the following systems of the human body: circulatory, renal/urinary, respiratory and digestive.

The acquisition of the basic competence of this subject will allow the student to understand the normal function of the systems and to confront the study of the physiopathology and the understanding of the mechanisms of diseases that affect the different systems of the human body during the next years.

The general training objectives of the subject are:

- To understand the basic concepts of physiology of the circulatory, respiratory, renal/urinary and digestive systems of the human body in health, as well as the mechanisms of adaptation to the environment.
- To acquire a comprehensive and integrated view of the interrelations of the different systems of the body.
- To integrate the Physiology knowledge with concepts learned in other basic subjects, that deal with the structure and the cellular and molecular aspects of the organism, to achieve a global vision of the functioning of the human body.
- To train the student to apply the physiological knowledge in deducing the consequences of the diseases.
- To acquire practical skills in each one of the fields of Physiology for performing the most frequent functional tests in the biomedical field.
- To acquire attitudes aimed at the promotion of health and the prevention of disease, oriented towards health medicine, and appropriate for a medical practice based on scientific evidence.

Competences

- Critically assess and use clinical and biomedical information sources to obtain, organise, interpret and present information on science and health.
- Demonstrate basic research skills.
- Demonstrate knowledge of the principles and physical, biochemical and biological processes that help to understand the functioning of the organism and its disorders.
- Demonstrate understanding of the basic sciences and the principles underpinning them.
- Demonstrate understanding of the causal agents and the risk factors that determine states of health and the progression of illnesses.
- Demonstrate understanding of the functions and interrelationships of body systems at different levels of organisation, homeostatic and regulatory mechanisms, and how these can vary through interaction with the environment.
- Demonstrate understanding of the structure and function of the body systems of the normal human organism at different stages in life and in both sexes.
- Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
- Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
- Indicate the basic diagnosis techniques and procedures and analyse and interpret the results so as to better pinpoint the nature of the problems.
- Organise and plan time and workload in professional activity.
- Perform the basic practical procedures of examination and treatment.
- Use information and communication technologies in professional practice.

Learning Outcomes

1. Analyse the functional mechanisms that help the organism to adapt to the main environmental variations.
2. Apply knowledge of physiology to the production of structured review texts.
3. Demonstrate basic research skills.
4. Demonstrate, in professional activity, a perspective that is critical, creative and research-oriented.
5. Describe the general organisation and function of the systems of the human body in health.

6. Describe the interrelationship between the different body systems in the maintenance of homeostasis and good health.
7. Formulate hypotheses and compile and critically assess information for problem-solving, using the scientific method.
8. Identify physiological information sources, including textbooks, atlas images, internet resources and other specific bibliographic databases.
9. Identify the basic mechanisms of cell and tissue physiology.
10. Identify the basic principles of human nutrition.
11. Identify the functional disorders at the level of each system that cause various types of diseases.
12. Identify the functional variations of the human organism at different stages in life and their principal causes.
13. Identify the main experimental techniques in physiology and their usefulness to basic and applied research.
14. Identify the main techniques used in physiology laboratories.
15. Identify the scientific bases of human physiology.
16. Indicate techniques of functional studies that are appropriate for diagnosis and evaluation of biomedical procedures.
17. Interpret normal and abnormal results of techniques of functional studies of body systems.
18. Make correct use of the international physiological nomenclature.
19. Organise and plan time and workload in professional activity.
20. Perform basic techniques for the examination and functional assessment of physiological systems.
21. Relate the cell and tissue characteristics of the organs and systems of the body to their function.
22. Use information and communication technologies in professional practice.

Content

CIRCULATORY SYSTEM

INTRODUCTION

MYOCARDIUM PHYSIOLOGY

ELECTRICAL ACTIVITY OF THE HEART

CARDIAC CYCLE

REGULATION OF CARDIAC FUNCTION

NORMAL HEMODYNAMICS OF VENOUS SYSTEM

NORMAL HEMODYNAMICS OF ARTERIAL SYSTEM

MICROCIRCULATION

CAPILLARY AND LYMPHATIC SYSTEM

REGULATION OF ARTERIAL PRESSURE

CORONARY CIRCULATION

CEREBRAL CIRCULATION

CUTANEOUS CIRCULATION

SPLANCHNIC CIRCULATION

RESPIRATORY SYSTEM

INTRODUCTION

VENTILATION PHYSIOLOGY

PULMONARY VENTILATION

PULMONARY CIRCULATION

GAS EXCHANGE IN LUNGS

BLOOD TRANSPORT OF GASES

BREATH REGULATION

RENAL/URINARY SYSTEM AND BODY FLUIDS

GENERAL KIDNEY FUNCTIONS

GLOMERULAR HEMODINAMICS

MEASURING RENAL FUNCTION

URINARY CONCENTRATION MECHANISMS

VOLUME AND OSMOLARITY FLUID BALANCE

RENAL REGULATION OF ACID-BASE BALANCE

PHYSIOLOGY OF URINARY EXCRETION. MICTURITION

DIGESTIVE SYSTEM

FOOD INTAKE

GASTRIC MOTILITY

INTESTINAL MOTILITY

DIGESTIVE SECRETION

SALIVARY SECRETION

GASTRIC SECRETION

INTESTINAL SECRETIONS

DIGESTION AND ABSORPTION

LIVER PHYSIOLOGY

Methodology

The subject will have a format of mixed teaching modality.

Theory classes:

A systematic explanation of the subject topics, giving relevance to the most important concepts. The student acquires the basic scientific knowledge of the subject in theory classes, which will be complemented by self-study of the themes of the subject program. Lecture sessions will be done online by Microsoft Teams or

similar platforms. If sanitary situation allows it, some of the lectures will be done as face-to-face teaching sessions.

Laboratory practices:

Practical sessions for the observation and performance of procedures, the practical learning of physiological techniques, and their medical application. Group work and active self-learning promoted. These sessions will be done as face to face training form

Case-based work:

Work on cases and problems of relevance for learning the subject. The knowledge acquired in theory classes, practices and personal study is applied to the resolution of practical cases presented using the moodle application. These sessions will be done as face to face training form

Tutorial teaching:

Availability of tutorials for helping in the independent study of physiological concepts and application for the resolution of cases.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
CASE RESOLUTION WORK (PAUL)	5	0.2	1, 2, 4, 7, 11, 8, 17, 19
LABORATORY PRACTICES (PLAB)	21	0.84	1, 3, 7, 13, 16, 17, 19, 20
THEORY (TE)	44	1.76	1, 5, 6, 10, 11, 8, 13, 12, 16, 20, 21
Type: Supervised			
TUTORIALS	20	0.8	1, 7, 11, 8, 16, 22
Type: Autonomous			
PREPARATION OF CASE-BASED WORK AND PRACTICES	20	0.8	1, 2, 3, 4, 5, 6, 7, 15, 9, 10, 11, 8, 13, 14, 12, 16, 17, 19, 20, 21, 18, 22
SELF STUDY	80	3.2	1, 6, 7, 9, 11, 8, 13, 16, 17, 19, 20

Assessment

The evaluation of the subject will be based on the theoretical and practical syllabus contained in the Program.

1. Evaluation model:

Each block or system that integrates the program of the subject will be evaluated individually, both from the theoretical and practical syllabus (including laboratory and case practices).

Systems for evaluation in Medical Physiology I are considered:

- Cardiovascular system
- Respiratory System
- Excretory System and Body Fluids
- Digestive system

To pass the subject, each of the four blocks must be passed with a minimum grade of 5.0.

Throughout the course there will be several tests, two partial exams, and a final exam.

2. Continuous evaluation:

Continuous evaluation:

The continuous evaluation of each system will consist of:

A. Partial exam with:

- Multiple choice items and/or written questions to assess the theoretical knowledge of the subject and the concepts related to laboratory practices.

The grade of the partial exam will represent 85% of the overall grade of the system.

B. Tests throughout the course on the knowledge acquired in laboratory practices and case studies. The mark of these tests will be 15% of the final grade and will be distributed in:

- Evaluation of laboratory practices, through *on-site* tests and/or questionnaires performed in the Moodle application, on the concepts developed in the practices. This qualification will represent 10% of the overall grade of the system.
- Questionnaires on case resolution and practical problems, carried out through *on-site* tests and/or in the Moodle application, which will represent 5% of the overall grade of the system.

To pass each system, a minimum of 5.0 must be obtained in the partial exam (section A) and a minimum of 5.0 in the overall grade of the system (85% partial exam A + 15% questionnaires B).

To pass the subject, it will be necessary to have passed each of the systems with a minimum of 5.0, and that the global average needs to be equal to or greater than 5.

In this case, the final grade will be the weighted average (by the extension of the system) of the grades obtained in each of the passed systems.

Final exam:

A final exam will be carried out, to those students who have not passed the subject in the continuous evaluation. Students will perform the evaluation of only those systems that have not passed in the continuous evaluation of the same academic year.

The final exam of each system will be evaluated by multiple choice items and/or written questions and the knowledge will be evaluated:

- Theoretical knowledge will be weighted 75% of the final grade.
- Laboratory practices and case studies will be weighted 25% of the final grade.

To pass each system the student must obtain a minimum of 5.0 in the exam.

To pass the subject it will be necessary to have passed all the systems with a minimum of 5.0. In this case, the final grade will be the weighted average (by the extension of the system) of the grades obtained in each of the approved systems. In case of not passing any of the systems, the maximum grade obtained will be 4.8.

Those students who have not performed any evaluable task will be considered as "not evaluable"

Exam revision:

Students may submit claims to the exam's questions during the first 24 hours following the completion of the tests.

The review of the qualifications of the partial and final exams will be carried out on the date announced.

Single evaluation

Students can take advantage of the single assessment system, according to the regulations of the Faculty. Single assessment will be based on the content of the subject's program, the acquisition of the same competences, and will have the same level of demand as continuous assessment.

Single assessment will consist of tests that will be carried out on the same date scheduled for the continuous evaluation for each of the systems or blocks of the subject.

For the evaluation of each system or block, an exam consisting of multiple choice questions and/or written questions will be carried out to evaluate the theoretical knowledge of the subject and the concepts related to laboratory practices and case studies, with an approximate weighting of 75% and 25% of the overall grade of each one system.

To pass each system students must obtain a minimum of 5.0 in the exam.

To pass the subject, a minimum of 5.0 is required in each of the four systems or blocks. In this case, the final grade will be the weighted average (by the extension of the system) of the grades obtained in each of the systems. In case of not passing any of the systems, the maximum grade obtained will be 4.8.

A student who does not perform any evaluable task, it will be considered as "not evaluable"

Final exam. The same retaking system will be applied as for continuous assessment.

The revision of the exam will follow the same procedure as for continuous assessment.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Practical evaluation and/or questionnaires in Moodle application	15%	1	0.04	1, 3, 4, 6, 7, 9, 10, 11, 8, 12, 16, 17, 19, 20, 21, 18, 22
Written evaluation through objective tests: 4 tests of multiple choice and/or short questions about the concepts given during the lecture sessions (75%) and laboratory and room practices (10%)	85%	9	0.36	1, 2, 4, 5, 6, 15, 9, 10, 11, 13, 14, 12, 19, 21

Bibliography

- BERNE R, LEVY M. Fisiología (7th ed.). Elsevier-Mosby, 2018.
- GUYTON AC, HALL JE. Tratado de Fisiología Médica (14th ed.). Elsevier-Saunders, 2021.
<https://www.clinicalkey-com.are.uab.cat/student/content/toc/3-s2.0-C20200037060>
- TRESGUERRES JAF. Fisiología Humana (5th ed.). Mc Graw Hill-Interamericana, 2020.
- WEST JB. Fisiología Respiratoria (8ª ed.). Panamericana, 2009.

Software

no specific software is used