

**Function of the Human Body I**

Code: 101789  
ECTS Credits: 6

Degree	Type	Year	Semester
2500891 Nursing	FB	1	1

**Contact**

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**Use of Languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: No  
Some groups entirely in Spanish: No

**Teachers**

Josep Bartomeu Cladera Cerda  
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**Prerequisites**

It is desirable that the student has acquired basic knowledge and skills about the structure and organization of the human body and its cellular systems, as well as basic knowledge of Physics and Chemistry.

**Objectives and Contextualisation**

The subject *Function of Human Body I* is programmed during the first semester of the first year of the Degree of Nursing and develops the knowledge of the physical and physiological bases of the human organism. This last part is specified in the study of general physiology, the physiology of blood and haematopoietic organs, the physiology of the respiratory system, and the physiology of the cardiovascular system. Likewise, for each of these systems, the knowledge of physiopathological processes and their demonstrations are developed.

The basic learning objectives are:

- To learn the physical bases and basic concepts of the physiology of the different functional systems of the human body in a state of health.
- To acquire a complete and integrated vision of the interrelations of the different systems of the organism.

- To integrate the knowledge of Biophysics and Physiology with those acquired in other basic subjects, which deal with the structure and the cellular and molecular aspects of the organism, in order to achieve a global vision of the functioning of the human body.
- To achieve a better understanding of the basic concepts of the effects of the interaction of radiation with living beings and radio protection.
- To train the student to apply the physiological knowledge in the deduction of the consequences of the diseases.
- To acquire the practical skills in each of the necessary areas for the performance of the most frequent functional studies techniques in the biomedical field.
- To acquire attitudes aimed at the promotion of health and the prevention of disease, oriented to health medicine, and appropriate to the practice based on scientific evidence.

## Competences

- Analyse and synthesise complex phenomena.
- Develop independent learning strategies.
- Find, evaluate, organise and maintain information systems.
- Offer technical and professional health care and that this adequate for the health needs of the person being attended, in accordance with the current state of scientific knowledge at any time and levels of quality and safety established under the applicable legal and deontological rules.

## Learning Outcomes

1. Analyse and synthesise complex phenomena.
2. Describe the three basic elements for any feedback control system.
3. Develop independent learning strategies.
4. Explain the physiological functioning of the human body and the homeostatic mechanisms that regulate it.
5. Find, evaluate, organise and maintain information systems.
6. Identify the physiological functioning of the human body, and health problems resulting from functional disturbances.
7. Identify the signs and symptoms that derive from a situation of malfunctioning of the human body.
8. Recognise situations of risk to life and know how to carry out the basic and advanced life-saving manoeuvres.

## Content

### A. BIOPHYSICS

#### 1. PHYSICAL BASIS OF DIALYSIS AND OSMOSIS.

- FICK'S LAW

- DIFFUSION THROUGH MEMBRANES. OSMOSIS PHENOMENA IN MEMBRANES

- DIALYSIS PHENOMENA

- BIOLOGICAL IMPORTANCE

#### 2. INTERACTION OF WAVES AND RADIATIONS WITH THE LIVING BEING.

- ELECTROMAGNETIC WAVES AND RADIATIONS. PHYSICAL BASES AND SOME APPLICATIONS IN DIAGNOSIS AND THERAPY:

TC (Computed tomography for obtaining anatomical images in three dimensions for diagnosis, examples in the detection of tumors)

GAMMAGRAPHIES (use of radiation examples of the detection of bone pathologies)

SPECT AND PET three-dimensional images for diagnosis with functional information, examples in the detection of tumors and detection of markers in neurodegenerative diseases)

EXTERNAL, INTERNAL OR ENDOCAVITARIAN RADIOTHERAPY

- DOSE AND RADIOPROTECTION

B. PHYSIOLOGY

1. GENERAL PHYSIOLOGY

- ION TRANSPORTATION THROUGH THE CELLULAR MEMBRANE

- CELL ELECTRICAL PHENOMENA

- SYNAPTIC TRANSMISSION

- MUSCLE EXCITATION AND CONTRACTION

- PHYSIOLOGY OF EPITHELIAL CELLS

- FUNCTIONS OF SKIN PROTECTION

2. BLOOD AND HEMATOPOIETIC ORGANS

- COMPOSITION AND FUNCTIONS OF THE BLOOD

- BLOOD PLASMA

- RED BLOOD CELLS

- LEUKOCYTES

- LYMPHOCYTES AND IMMUNITY

- BLOOD GROUPS

- HAEMOSTASIS

3. RESPIRATORY SYSTEM

- INTRODUCTION TO RESPIRATORY PHYSIOLOGY

- VENTILATION MECHANICS

- PULMONARY VENTILATION

- PULMONARY CIRCULATION

- GAS EXCHANGE IN LUNGS

- BLOOD TRANSPORT OF GASES

- REGULATION OF BREATHING

4. CARDIO-VASCULAR SYSTEM

- INTRODUCTION TO THE CARDIO-VASCULAR SYSTEM
- MYOCARDIUM PHYSIOLOGY
- ELECTRICAL ACTIVITY OF THE HEART
- CARDIAC CYCLE
- REGULATION OF THE CARDIAC FUNCTION
- NORMAL HEMODYNAMICS OF VENOUS SYSTEM
- NORMAL HEMODYNAMICS OF THE ARTERIAL SYSTEM
- MICROCIRCULATION. CAPILLARY AND LYMPHATIC SYSTEM
- MECHANISMS OF BLOOD FLOW CONTROL
- REGULATION OF BLOOD PRESSURE
- CIRCULATION IN SPECIAL REGIONS

## Methodology

TIPUS D'ACTIVITAT	ACTIVITAT	HORES
Directed (35%)	Theory classes with ICT support	29
	Instrumental laboratory practices	12
	Classroom practices: seminars for presentation and discussion of cases and problems	12
Supervised (10%)	Support tutorials for the understanding of the subject and development of the marked learning objectives	15
Autonomous (50%)	Preparation of case and problem seminars: analysis of the problem, information search, writing answers, preparation of the presentation	20
	Preparation of the objectives of knowledge and skills proposed. Search for information, realization of diagrams and summaries and conceptual assimilation	55
	Personal study	
Evaluation (5%)	Written tests	7

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
CASE-RESOLUTION WORK (PAUL)	12	0.48	1, 5, 3, 4, 6, 7, 2
LABORATORY PRACTICES (PLAB)	12	0.48	1, 3, 4, 6, 7, 8, 2
THEORY (TE)	29	1.16	1, 4, 6, 7, 2
Type: Supervised			
Tutorials	15	0.6	1, 3, 4, 6, 7, 2
Type: Autonomous			
PERSONAL STUDY	75	3	1, 5, 3, 4, 6, 7, 8, 2

## Assessment

The evaluation of the subject is based on the theoretical and practical topics detailed in the guide. The subject is structured in two sections, Biophysics, which represents 33.3% of the final mark, and Physiology, which represents 66.6% in accordance with the contribution of these two matters.

The competences of this subject will be evaluated by means of:

- Continuous evaluation:

There will be partial assessments during the course, for the different units of the program. The subject is divided into two sections:

1) Biophysics.

Partial exam (95% of the grade from the part of Biophysics -31.67% of the total of the subject-).

The evaluation in the partial exam will consist of two parts:

- A first part where the theoretical knowledge will be evaluated by means of objective tests with multiple-choice items (60% of the mark of the exam -19% of the total of the subject-).

- A second part where the seminars will be evaluated by solving problems with restricted questions (40% of the exam's grade -12,67% of the total of the subject-).

Evaluation of the laboratory practices (5% of the grade from the block of Biophysics -1,67% of the total of the subject -):

Attendance and delivery of the questionnaire about the knowledge and skills developed at the laboratory practices

2) Physiology

Partial exam (75% of the grade from Physiology -50% of the total of the subject-):

The evaluation will consist of a partial exam through objective tests with multiple choice items. This exam will assess the understanding and knowledge of the concepts that the student must have acquired both in the theoretical classes and practical classes, as well as in their own self-learning. The result of this test will be 75% of the final grade of Physiology.

Evaluation of seminars and laboratory practices (25% of the grade from Physiology -16.67% of the total of the subject-):

- Cases and problems worked in the seminars, through presentation of works and/or questionnaires
- Knowledge and practical skills, through the presentation of results, questionnaires and/or written tests, developed in laboratory practices.

It is necessary to obtain a minimum of 4.0 in the partial theory exam in order to be able to incorporate this evaluation grade of seminars and practices.

It is essential to obtain a grade equal to or higher than 4.0 in each written evaluation (partial exams) to pass the subject.

The subject grade will correspond in 33.3% to that obtained in the Biophysics block, and in 66.6% of the Physiology block. To pass the subject, you must obtain a minimum of 5.0 in the final grade.

- Final recovery test:

Students who have not passed the subject through continuous evaluation may submit to a final recovery exam, where the student will only have to submit to the blocks he /she has not passed in the continuous evaluation exams of the same academic year.

- According to general regulations of the UAB, in order to participate in the final recovery exam, students must have been previously evaluated in a set of activities whose weight equals to a minimum of two-thirds of the total grade of the subject.

- The recovery test will be carried out in all cases with objective tests with multiple choice items of each block.

The subject will be exceeded when the final grade is equal to or greater than 5.0.

It will be considered as "non-evaluable" when there is not enough evidence to allow a global evaluation of the subject. In order to evaluate the subject comprehensively, you must have evaluation results of the two blocks in which it is divided (from the two partial exams and/or the final recovery exam).

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Biophysics Block - Practice: essay tests of restricted questions / resolution of problems	14,33%	1	0.04	1, 3, 4, 6, 7, 2
Biophysics Block - Theory: written evaluation through objective tests: multiple-choice questions	19%	2	0.08	1, 3, 4, 6, 7, 2
Physiology Block - Practice: written evaluation through objective tests: multiple choice questions / restricted questions essay tests / problem solving	16,67%	2	0.08	1, 5, 3, 4, 6, 7, 8, 2
Physiology Block - Theory: written evaluation through objective tests: multiple-choice questions	50%	2	0.08	1, 3, 4, 6, 7, 2

## **Bibliography**

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