"Function of the Human Body II"

2022/2023

Code: 106098
Credits ECTS: 9

Degree	Type	Course	Semester
2500891 Nursing	Basic Training	1	Annual

Contact:

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Use of languages:

Principal working language: Catalan
English group: No
Catalan group: Yes
Spanish group: No

Prerequisites

There are no official prerequisites.

Contextualization and objectives

This subject is part of Basic Sciences training module of the Nursing degree, Physiology and Physiopathology subject are planned in the first and second semester.

The fundamental objective is to know how the different organs and systems that are part of the human body work and to understand the basis of diseases due to their dysfunction.

Knowing the diseases and the process involved in them is an indispensable requirement for the nursing student to be able to respond to people's health problems at all stages of the life cycle, in order to evaluate them from an integral perspective and to be able to develop the necessary strategies to solve them through the nursing care process.

The purpose of this course is to know the triggering process of the diseases in the different stages of the life cycle, identifying the manifestations that appear in the different phases of the physiopathological alterations, as well as the determinant risk factors of the state of health/disease.

Learning objectives of the subject:

1. To know the normal functioning of organs and systems.

2. To identify the main diseases of the human body by apparatus or systems according to the signs or symptoms.

3. Describe the first choice treatments of the main pathologies.

4. Develop a thorough knowledge of medical terminology in relation to medical semiology.

5. Relating and understanding physiopathology with the treatment of the main diseases of the human body.

Competences and learning outcomes

Competences	Learning outcomes
SPECIFIC	
E01. To provide technical and professional health care appropriate to the health needs of the people it serves, in accordance with the state of development of scientific knowledge at any given time and with the levels of quality and safety established in the applicable legal and deontological standards.	E01.29 List the different types of microorganisms and parasites of health interest. E01.30 Identify diseases triggered by germs and their relationship to other socio-environmental factors. E01.31 Identify the pathophysiological processes and their manifestations, as well as the risk factors that determine the states of health and disease in the different stages of the life cycle. E01.32 Recognize life-threatening situations. E01.33 Demonstrate the ability to perform basic life support operations. E01.34 Identify advanced life support operations. E01.37 Identify diagnostic imaging tests and examinations used in various pathophysiological conditions.
GENERALS / BASICS	
G01 Introduce changes in the methods and processes of the field of knowledge in order to provide innovative responses to the needs and demands of society	G1.03 Acquire and use the tools necessary to develop a critical and reflective attitude.
G04 To act in the area of own knowledge by assessing gender/gender inequalities.	G04.03 Analyse sex differences and gender inequalities in etiology, anatomy, physiology, pathology, differential diagnosis, therapeutic options, pharmacological response, prognosis, and nursing care.
B01 That students have demonstrated possession and understanding of knowledge in an area of study that builds on the foundation of general secondary education, and is usually at a level that, while relying on advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.	

Content

MODULE 1.

LOCOMOTIVE SYSTEM

Functions of the locomotive system: movements of the locomotive system, support and protection.
Mechanics of the musculoskeletal system Mechanisms of levers.
Physiology and neurological control of contraction
Physiology and functions of the bones and muscles of: Head, spine, thorax, upper and lower limbs.
Stability of the spine.
Respiratory mechanics.
Gait, multi-joint movement.

NERVOUS SYSTEM

Nervous impulse. Impulse conduction. Arch and reflex centers.
Physiology and functions of: brain, cerebrum, cerebellum, diencephalon, brain stem and spinal cord
Physiology and circulation of the cerebrospinal fluid
Physiology of sleep and wakefulness.
Physiology and functions of the autonomic system.
Physiology of vision. Arrival of the impulse to the retina.
Physiology of hearing. Air, bone, fluid, and nerve conduction
Physiology of balance.
Physiology of taste.
Physiology of smell.

ENDOCRINE SYSTEM

Mechanisms of action of hormones. Control of secretion.
Physiology and functions: pituitary gland, neuro-pituitary, growth hormone, thyroid, parathyroid, adrenal and endocrine pancreas.

URINARY SYSTEM

Physiology and function of the nephron: filtration, resorption, secretion, dilution and concentration of urine.
Final urine formation.
Physiology of urination

DIGESTIVE SYSTEM

Physiology of digestion. Food preparation, chewing, salivation, swallowing.
Physiology and control of gastric secretion and motility
Physiology and functions of the small intestine: digestion and absorption
Physiology and functions of the large intestine: excretion
Physiology and function of the pancreas: pancreatic secretion, composition, function and control
Physiology and function of the liver. Portal and hepatic blood circulation.
Gallbladder secretion: composition and function of bile
Intestinal motility.

RESPIRATORY SYSTEM

Oxygen in cellular life: systems for the capture and transport of oxygen
Function of the upper and lower airways.
Lung ventilation: inspiration, expiration and apnea Lung volumes and capacities. Dead space.
Respiratory musculature.
Airway pressures.
Neurological control of breathing.
Pulmonary diffusion and transport of blood gases: physical principles, alveolo-capillary membrane and surfactant

CARDIOVASCULAR SYSTEM

Main functions: circuit concept, pump and valves, pulmonary and systemic circulation.
Cardiac contraction: cardiac cycle, relationship between pressure and valve movement.
Electrical activation of the heart muscle.
Mechanisms of adaptation of the cardiac pump: debit, preload, post-load, contractility, peripheral resistances.
Exercise as an example of adaptation of cardiac output.
Physiology and functions of the arteries and veins
Physiology of microcirculation. Fluid dynamics.
Physiology of pulmonary circulation.
Physiology of fetal and neonatal circulation: changes at the time of birth.

DEFENSE SYSTEM

Physiology and function of blood: plasma, red blood cells, platelets, leukocytes.
Normal values of the hemogram.
Physiology and metabolism of iron.
Blood groups A, B, 0 and Rh system
Physiological mechanisms of blood clotting
Physiological mechanisms of inflammation
Physiology of immunology: natural and acquired, humoral and cellular
Specialization of lymphocytes. B lymphocytes and T lymphocytes.
Mechanisms of action of antigens and antibodies
Joint physiology of the immune system. Vaccination and hypersensitivity reactions.

REPRODUCTIVE SYSTEM

Physiology of the female reproductive system: ovary, uterus, tubes, vagina
Ovogenesis. Sexual cycle: ovarian cycle and endometrial cycle
Hormonal regulation of the sexual cycle. Ovarian hormones.
Physiology of the mammary gland: lactation, hormones and lactic secretion
Physiology of the male reproductive system: spermatogenesis.
Hormonal secretion: testosterone.
Physiology and composition of semen. Sterility.
Physiology of the sexual act.

EMBRIOLOGY
Physiology of fertilization. In vitro fertilization. Cloning.
Physiology of embryogenesis
Physiology of fetal genesis.
Physiology of the umbilical cord
Physiology of the placenta. Hormonal secretion.
Prenatal studies.

MODULE 2. General concepts related to diseases

Theme 1. General concepts of pathology

Concept of General Pathology. Signs, symptoms, syndromes, semiology. Concept of disease. Etiology. Types of causes of diseases. Physiopathology. Pathological anatomy. Evolution of diseases. Prognosis. Types of treatments.

Theme 2. Physiopathology of inflammation and pain

Concept of inflammation. Mechanisms. Inflammation as a useful reaction. Inflammation as a harmful reaction. Concept of pain. Types of pain. Causes and mechanisms of pain production. Anatomical pain conduction pathways Measurement of pain. Physical and psychological impact of pain. Pain management.

Theme 3. Physiopathology of body temperature regulation
Body temperature normal. Fever. General manifestations. hyperthermia Treatment for hyperthermia. Accidental hypothermia. Methods of rewarming.

Theme 4. Physiopathology of neoplasms
Tumor definition. Concept of cancer and benign tumor. Clonality. Endogenous and exogenous risk factors Harmful effects of tumors on the body. TNM classification. Tumour markers. Strategy of action against tumors. Evaluation of the quality of life in oncological diseases Karnofsky index and Rankin scale.

Theme 5. Physiopathology of the immune function
Types of immune response. Indicators of immune dysfunction. risk factors Autoimmune disorders Immunodeficiences allergic disorders Rheumatic disorders. HIV and AIDS. Mechanism of infection. Related diseases. Transmission Clinical. Prevention. Ethics. Diagnosis and treatment.

Theme 6. Surgical physiopathology
Biological process of wound healing. Mechanical trauma: wounds and contusions Polytraumatisms. Surgical approach routes. Drains and probes. Cutaneous stomas. Surgical infection: local, general. Sepsis. Nutrition of the surgical patient. Post-surgical complications. Donation and transplantation of solid organs.

MODULE 3. Physiopathology

Theme 1. Respiratory physiopathology

General. Diagnostic tests (radiology, gasometry, functional tests...) Acute respiratory failure. Alterations in ventilation: hypoxia, hypercapnia, dyspnea, cyanosis. Respiratory distress. Pulmonary syndromes: acute and chronic bronchitis. Pulmonary emphysema. Bronchiectasis. Bronchial Asthma. Pneumonia. Pulmonary tuberculosis. pnemoconiosis lung cancer hypertrophic osteoarthrosis pulmonary fibrosis lung abscess Pleural syndromes: Pleuritis. Chylothorax. Hemothorax. Pneumothorax. Pleural tumor. Oxygen therapy. Mechanical ventilation.

Theme 2. Cardiocirculatory physiopathology

General. Tests Cardiocirculatory and hemodynamic physical exploration. Right and left heart failure. Shock. ECG. Dilated, hypertrophic and restrictive cardiomyopathies. Myocarditis. Endocarditis. Ischemic heart disease. AMI. Angina pectoris. SCASEST and SCACEST. Valvulopathies. Alterations in heart rate and rhythm. Arrhythmias and blockages. Pacemakers. ICD. Cardiorespiratory arrest. Basic cardiopulmonary and cerebral resuscitation. Cardioversion. Defibrillation. Congenital cardiopathies of major interest. Pericarditis. Reservoir and pericardial tamponade. Arterial hypertension. Aortic aneurysm. Circulatory insufficiency of the extremities: arterial, venous. Raynaud's phenomenon. Pulmonary thromboembolism. Cardiac transplantation. Diagnostic procedures (radiological and others) Therapeutic surgery.

Theme 3. Physiopathology of the blood and the hematopoietic system

I remember normal blood values. Anemias. Iron deficiency anemia. sideroblastic anemia megaloblastic anemia anemia secondary to chronic disease Hemolytic anemia. Aplastic anemia. polyglobulia polycythemia vera leukocytosis leukopenia leukemias Hodgkin's and non-Hodgkin's lymphomas. Thrombocytopenia. Idiopathic thrombocytopenic purpura. Thrombotic thrombocytopenic purpura. Multiple myeloma. Coagulation disorders. Hemophilias. Disseminated intravascular coagulation. Vitamin K deficiency. ABO system. Transfusions of hematological derivatives. Bone marrow transplantation.

Theme 4. Physiopathology of glands and metabolism

Main types of endocrine disorders. Endocrine pathology of the hypothalamus and pituitary gland Prolactin. growth hormone Gonadotropins (LH and FSH). Thyrotropin (TSH). Adrenocorticotropic hormone (ACTH). Endogenous opioids. Vasopressin (ADH). Diabetes insipidus. inadequate secretion of antidiuretic hormone oxytocin the thyroid gland non-toxic goiter hypothyroidism hyperthyroidism Thyrotoxic crisis. Follicular thyroid cancer. Medullar thyroid cancer. Thyroid adenomas. Thyroiditis. Parathyroid glands.hyperparathyroidism. Hypoparathyroidism. Eudohypoparathyroidism. Adrenal cortical hormones. Cushing's syndrome. Adrenal insufficiency. hyperaldosteronism excess adrenal androgens pheochromocytoma Diabetes mellitus: classification, clinical, control, acute complications, late complications, prognosis. Insulin resistance and allergy. Endocrine alterations of the testicles. Endocrine alterations of the ovaries. Endocrine disorders of the breast. Gastrointestinal hormones. Diagnostic procedures (radiological and others). Surgical therapeutics.

Theme 5. Digestive and gastrointestinal physiopathology

Abdominal pain. Digestive bleeding. Intestinal obstruction. Peritonitis and intra-abdominal abscesses Esophagus. Inflammatory, mechanical and tumoural pathology. Stomach and duodenum. Inflammatory and tumoural pathology. Small intestine. Inflammatory and tumoral pathology. Large intestine: inflammatory and tumoral pathology. Liver and biliary tract. Inflammatory and tumoral pathology. Pancreas. Inflammatory and tumoral pathology. Hernias of the abdominal wall. Diagnostic procedures (radiological and others).

Theme 6. Renal and urinary tract physiopathology

Acute kidney failure. Chronic renal insufficiency. Fundamentals of dialysis Peritoneal dialysis and hemodialysis Glomerulonephritis. Nephritic syndrome. Nephrotic syndrome. Urinary tract infections. Acute pyelonephritis. Chronic pyelonephritis. Prostatitis. cystitis urethritis Renal lithiasis. Polycystic kidney disease. Renal neoplasms. Neoplasms of the urinary bladder. Benign prostatic hyperplasia. Prostate cancer. Urinary incontinence. Homeostatic mechanisms. Fluid volume disorder. hydroelectrolyte imbalance Diagnostic procedures (radiological and others). Surgical therapeutics.

Theme 7. Musculoskeletal physiopathology

Metabolic and degenerative pathology of the locomotive system. Osteoarticular infectious pathology.

Tumors of the locomotive system. Traumatic pathology of the locomotive system. Pathology of the upper limb. Pathology of the lower limb. Spine and neck pathology. Diagnostic procedures (radiological and others). Therapeutic surgery. Radiology.

Theme 8. Physiopathology of the nervous system

Motility, gait and posture disorders. Spinal syndromes. Disorders of the quoncience. Coma. Glasgow scale. Headaches. Sleep disorders. Central and peripheral conduction disorders. CNS infections. Cerebral vascular pathology. Degenerative and metabolic diseases. TCE. ICP. Complementary tests (Radiology)

Theme 9. Ophthalmological physiopathology

Refraction defects: hyperopia, myopia, astigmatism, presbyopia. Eye mobility: extrinsic muscles, strabismus and extrinsic muscle paralysis. Eyelids: blepharitis, stye, ectropion and entropion. Conjunctiva: conjunctivitis, cornea: keratitis, ulcers. Corneal transplant. Tear duct: diacryocystis. Uvea: sclera: scleritis. Iris: pupillary reflexes, iritis. Choroid. Crystalline: cataracts. Intraocular fluids: vitreous humor. Aqueous humor. Glaucoma. Retina: exploration of the fundus of the eye. Retinal detachment. Optic nerve: papilla edema, optic neuritis, optic atrophy. Ophthalmic traumatology: burns, foreign bodies, penetrating wounds, ocular contusion. Diagnostic procedures (radiological and others) . Surgical therapeutics.

Theme 10. Dermatological physiopathology

Structure of the skin. Elementary skin lesions. Basis of the dermatological treatment.

Skin infections: bacteria, fungi, viruses. Parasites. Eczema and atopic dermatitis

Urticaria and angioedema. Toxicodermias. Psoriasis. Diseases of the pilo-sebaceous follicle: acne, rosacea Blistering diseases. Pernicious effects of solar radiation. Photoprotection.

Benign and malignant skin tumours. Burns. Skin ulcers. Systemic diseases.

Theme11. Otorhinolaryngological physiopathology

Otology: otolaryngology, otolaryngology, otalgia, hearing loss, vertigo and facial paralysis
Cerumen plug. Foreign bodies. Furuncle. Acute and chronic suppurative otitis. Otosclerosis. Dizzying syndromes, deafness of perception. Diagnostic procedures. Surgical Therapeutics
Rhinology: rhinorrhea, nasal obstruction, epistaxis and anosmia. Nasal Furuncle. Common cold. Vasomotor rhinitis. Epistaxis. Nasal obstruction. Hypertrophy of turbinates. Imperforation of coanas. Sinusitis. Nasosinusal tumors. Foreign bodies and fractures. Diagnostic procedures. Surgical therapeutics. Pharyngology-Laryngology: Dysphonies, dysphagia, dyspnea and regional adenopathies. Adenoids. Tonsils. Peritonsillar phlegm. Pharyngitis. Tonsillitis. Tumors of the region. foreign bodies laryngitis vocal nodules and polyps Laryngeal paralysis. cancer of the larynx Diagnostic procedures Diagnostic procedures (radiological and others)

Theme 12. Psychiatric physiopathology

Psychotic disorders. Affective disorders. Anxiety disorders. Personality disorders
Eating disorders

Methodology

The methodological approach of the subject places the student at the centre of the teaching-learning process. The student has to be active and autonomous throughout the learning process, while the teacher provides with the necessary information and resources for the learning.

Directed activity:

The course is face-to-face with non-compulsory attendance. The fundamental teaching methodology used is the theoretical lecture expository, participatory and group developing active listening and exposure, classroom practices with discussion and group or individual exercises and activities that may be included in the development of TE classes.

A laboratory practice workshop on cardiorespiratory arrest and basic cardiopulmonary resuscitation, attendance is compulsory. It is scheduled in groups of between 10 and 15 students maximum.

Supervised activity:

The classes are a support for the student's autonomous study of the recommended bibliography. Tutorials can be face-to-face or online. Depending on the needs of time in the development of the subject, the tutorial classes will be integrated into TE and PAUL classes. Any doubts that students may have in relation to the subject may be resolved at any time, preferably in any type of class, or by e-mail to the lecturer responsible for the subject that generates the doubt if it is not possible to access the class in person.

Activities

Activity	Hours	ETCS	Learning Outcomes
Type: Directed . Theory . Classroom practices . Laboratory practices	78,75 1	3,15 0,04	E01.29, E01.30, E01.31, E01.37 E01.32, E01.33, E01.34 B01, G01.03, G04.03
Type: Supervised . Tutorial	1	0,20	
Type: Autonomous: . Bibliographic consultation	123,75	4,95	

Assessment

Students have only one sitting per academic year to pass the subject.

Academic progression and passing the subject will be assessed by means of a continuous and formative evaluation, through two 40-question multiple-choice tests and a written concept test that will take place at the same time as one of the two multiple-choice tests (with prior notice). Each multiple-choice test will have a weight of 47.5%, while the concept test will have a weight of 5%.

In the multiple-choice tests, wrong answers penalise according to the following formula:
NOTA = successes - (errors/n-1), where *n* is the number of answer options. Its value will be between 0 and 10.

The concept test will be graded from 0 to 10.

The final grade of the course is obtained from weighted average of the marks obtained in the two multiple-choice tests (from a 5 in each of them) and the concept test.

Requirements to be able to make the average:

1. A minimum mark of 5 is required in each of the two multiple-choice tests. The mark for the concept test may be lower than 5.
2. The student must have taken at least 66.6% of the total weight of the assessment tests. (this means that he/she must have taken the two multiple-choice tests).

Qualification:

- 0 to 4, 9: Fail
- 5, 0 to 6, 9: Pass
- 7, 0 to 8, 9: Satisfactory
- 9, 0 to 10: Excellent (in the event that the student has obtained a grade equal to or greater than 9 may, at the discretion of the teacher, be eligible for an honorary degree).

Recovery Activity

A second chance activity is proposed to students who have been previously assessed for a set of activities whose minimum weight is equivalent to 2/3 of the total grade of the subject and who have obtained a final grade higher than 3.5 and lower than 5.

This test will consist of a single evaluation activity depending on the part not passed. That is to say, if the failed multiple-choice test is the first one, only that part will have to be assessed. If it is the second part, only the second part will be assessed. In the case of failing both, both will have to be assessed.

There will be no make-up test for the concept test.

If the student meets the passing the recovery test corresponding to the failed part (mark of 5 or more), mark for the test will be recorded as a 5. This mark will be the one that will be averaged with the other test (if passed) and the concept test, in order to obtain the final mark for the subject.

The make-up tests will be determined by the teacher, usually a multiple-choice test, which will include all the contents of the failed part.

Once the course has been passed, it cannot be re-evaluated.

Non-evaluable:

It will be considered non-assessable when the student has not participated in any of the continuous assessment activities.

Final grade review:

Once the final grade is published, the student may request the review of the test in the given period for this purpose. Requests for review are not accepted on dates outside the established limit.

Behaviour Rules

The professor may downgrade between 1 and 2 points out of 10 to a student who repeatedly does not respect the indications on standards of class behaviour.

Assessment Activities

Activity	Weight	Hours	ETCS	Learning Outcomes
Test type 1 Test type 2 Proof of concepts	47.5% 47,5% 5%	7,5	0,28	E01.29, E01.30, E01.31, E01.32, E01.33, E01.34, E01.37 B01, G01.03, G04.03

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Author Rozman, C. / Cardellach, F.
Edition 19ª edition. Editorial Elsevier
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HARRISON’S. PRINCIPIOS DE MEDICINA INTERNA

Author J. Larry Jameson, Anthony Fauci, Dennis L. Kasper Stephen L. Hauser, Dan L. Longo, Joseph Loscalzo
Edition 20ª edition. Mcgraw-Hill Interamericana; 2020.
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TRATADO DE PATOLOGÍA QUIRÚRGICA, 2 VOL.

Author Sabiston
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ESTRUCTURA Y FUNCIÓN DEL CUERPO HUMANO

Author ESCUREDO B, SANCHEZ J.M, BORRAS J, SERRAT J.
Edition 2ª edition. Mac Graw Hill Interamericana de España 2002
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