

Degree programme	Type	Course
Physiotherapy	FB	1

Contact lecturer

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Teaching staff

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Group languages

You can consult this information at the [end](#) of the document.

Prerequisites

There are no official prerequisites.

Students are strongly advised to have completed Biology at upper-secondary school level. Students without this background are encouraged to attend the preparatory course offered during the first week of September by the Faculty of Medicine.

Objectives

This course is taught in the first year of the Bachelor's Degree in Physiotherapy and is part of the basic training subjects. It provides an essential scientific foundation for the education of future physiotherapists. Its general objectives are to study the biochemical, cellular and histological foundations of the human body, which provide the essential basis for understanding its composition and function.

Learning outcomes

1. Identify physiological and structural changes that can take place as a result of the injury and/or disease process in the different systems.
2. Explain the functioning of the the human body in health in order to have a sound basis for understanding the processes that induce disease.
3. Identify life-threatening situations and perform basic and advanced life support manoeuvres.
4. Analyse and synthesise.
5. Solve problems.

6. Explain the theories of cell biology, envisioning the cell as a functional unit.
7. Explain the fundamental biochemical principles of the functioning of the human body.
8. Identify situations in which a change or improvement is needed.
9. Analyse a situation and identify its points for improvement.
10. Propose new methods or well-founded alternative solutions.
11. Weigh up the risks and opportunities of suggestions for improvement: one's own and those of others.
12. Propose new ways to measure success or failure when implementing innovative proposals or ideas.
13. Communicate using language that is not sexist.

Contents

This course aims to provide students with an understanding of the cell as the functional unit of life, the biochemical foundations of human body function, and human histology. It also addresses the functioning of the different systems and organs of the human body. In addition, students will study general pathophysiology, with particular emphasis on inflammation, tissue repair processes, pain, infection, fever, and asepsis. Basic life support, neoplastic pathophysiology, immunodeficiencies, and blood groups will also be covered.

The course is organized into three thematic modules: Cell Biology, Biochemistry, and Histology.

1. CELL BIOLOGY

(Module Coordinator: Ariadna Delgado Bermúdez, ariadna.delgado@uab.cat)

Introductory Course

- General organization of the cell
- General characteristics of prokaryotic cells
- General characteristics of eukaryotic cells

I. The Eukaryotic Cell

- Structure: plasma membrane, cytoplasm (cytosol, organelles, and cytoskeleton), and nucleus.
- Extracellular matrix.
- Cellular functions.

II. Cellular Compartmentalization

- Plasma membrane: functions, composition, and structure.
- Transport across the plasma membrane: small molecules, macromolecules, and particles.
- Cytosol.
- Endomembrane system: endoplasmic reticulum, Golgi apparatus, endosomes, and lysosomes.
Vesicular trafficking between compartments.
- Mitochondria and peroxisomes: structure, composition, and function.

III. Cytoskeleton, Cell Adhesion, and Cell Movement

- Cytoskeleton: actin filaments, microtubules, and intermediate filaments.
- Cell adhesion and junctions: adhesion molecules and types of junctions.
- Cell movement.

IV. Nucleus

- Nuclear structure and chromatin organization.
- Genetic information flow and regulation of gene expression.

V. Cell Communication

- Types of signaling.

- Components of signaling pathways: cellular receptors, signal transduction, and cellular response.
- Applications in physiotherapy: mechanotransduction.

Seminars

- Introduction to Genetics and Inheritance. Set of traits transmitted from parents to offspring according to genome segregation and genetic laws.

2. BIOCHEMISTRY

(Module Coordinator: Carles Gil Giro, carles.gil@uab.cat)

I. Structure and Function of Biomolecules

- Water, weak acids, and biological buffers.
- Amino acids, peptides, and proteins:
- Three-dimensional structure of proteins.
- Structural proteins: collagen.
- Catalytic proteins: enzymes.
- Hormones, membrane receptors, and cell signaling.
- Nucleotides and nucleic acids.
- Carbohydrates.
- Lipids.

II. Introduction to Metabolism

- Definition of nutrients; fundamentals of nutrient digestion and absorption.
- General principles of bioenergetics. The role of ATP in energy transfer.
- General characteristics of intermediary metabolism: catabolic and anabolic pathways.

III. Carbohydrate Metabolism

- Digestion and absorption of carbohydrates.
- Carbohydrate metabolism: glycolysis, gluconeogenesis, and glycogen metabolism.
- Tricarboxylic acid cycle.
- Mitochondrial electron transport and oxidative phosphorylation.

IV. Lipid Metabolism

- Digestion, absorption, and transport of dietary lipids.
- Metabolism of lipids with energetic and storage functions.
- Cholesterol metabolism.
- Lipid transport in blood: lipoproteins.

V. Nitrogen Compound Metabolism

- Nitrogen balance. Exogenous and endogenous sources of amino acids.
- Amino acid metabolism.
- Nitrogen-containing derivatives of amino acids.

VI. Integration and Regulation of Metabolism

- Metabolic characteristics of selected tissues: liver, muscle, adipose tissue, and brain.
- Metabolic interactions among tissues during the fed-fasting cycle.
- Hormonal and metabolic changes during exercise.

3. HISTOLOGY

(Module Coordinator: Joan Roig, joan.roig.soriano@uab.cat)

I. Introduction to Human Tissues

- Introduction to Histology. Definition of tissue.
- Classification of basic tissues.
- Histological processing.

II. Nervous System

- Central nervous system (CNS) and peripheral nervous system (PNS).
- Basic structure of the CNS: white matter and gray matter.
- Main areas of the CNS and their organization.
- Description of the main components of the PNS: spinal and visceral ganglia, plexuses, and nerves.

III. Musculoskeletal System

- Structure of bones and joints.
- Tendons and fasciae.
- Skeletal muscle fibers and their types.
- Neuromuscular junctions.

IV. Cardiovascular and Respiratory Systems

- Components of the cardiovascular system.
- Blood and lymphatic vessels.
- Organization of the cardiac wall.
- Components of the cardiac conduction system.
- Components of the respiratory system: trachea, bronchial tree, and lungs.

V. Genitourinary System

- Microscopic structure of the kidney.
- Urinary tract: tunics/layers.
- Histological structure of the male and female reproductive systems.

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
LABORATORY PRACTICES (PLAB)	8	0.32	
PREPARATION OF PROJECTS/ASSIGNMENTS	19	0.76	
INDIVIDUAL STUDY	134	5.36	
THEORY SESSIONS	40	1.6	
CLASSROOM PRACTICAL SESSIONS	7	0.28	
SPECIALISED SEMINARS	11	0.44	

The learning activities are presented in the corresponding table and are divided into autonomous learning activities and guided learning activities.

The theoretical classes for the Histology block will be conducted in a telepresence format, and students will access them from the theory classroom. Under no circumstances can these classes be accessed from outside the classroom or at a later time.

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.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Assessment of practical sessions and seminars using written objective tests, multiple-choice questions, or short-answer restricted essay questions.	28-38% of the final grade	2	0.08	1, 2, 3, 4, 5, 6, 7, 8, 9
Oral presentation of a group project developed during classroom practical sessions.	5% of the final grade	1	0.04	1, 2, 4, 6, 8, 9, 10, 11, 12, 13
Assessment of theoretical content through written objective tests, multiple-choice questions, or short-answer restricted essay questions.	57-67% of the final grade	3	0.12	1, 2, 6, 7

This course does not include a single assessment system.

In this course, each content block or module (Cell Biology, Biochemistry and Histology) is assessed independently through: assessable activities carried out during seminar sessions, classroom practical sessions or laboratory practical sessions; a final exam for each module and, if necessary, a resit examination for each of them. The final exam for each of the three modules is scheduled on different days, once the theoretical part of each content block has been completed. The resit exam, however, is scheduled on the same day for all three modules, although each block is still assessed independently. The dates assigned for all these exams can be found on the Faculty of Medicine website.

The requirements to pass each module can be found in the sections "Cell Biology Module Assessment", "Biochemistry Module Assessment" and "Histology Module Assessment", respectively. Students who do not meet the requirements must take the resit examination for the failed modules. Students who have passed the final exam may also take the resit exam in order to improve their grade. Sitting the resit exam implies renouncing the grade obtained in the first exam. Grades for each content block can be improved independently.

If all three content blocks are passed in the final exam with a grade of 5 or higher, the final course grade will be the average of the three module grades. If one or more resit exams are required, the average can only be calculated if at least two modules are passed in the resit with a grade of 5 or higher and the remaining module has a grade of at least 4. In this case, the course will be considered passed if the resulting average is 5 or higher. If any grade is missing for one or more content blocks, the final grade will be recorded as "Not assessable".

IMPORTANT: From the second enrolment onwards, repeating students will only be assessed on the modules not previously passed. This exemption applies for up to three additional enrolments.

ASSESSMENT SYSTEM:

- **THEORY:** Written assessment using objective written tests, multiple-choice items, or restricted essay questions, with an overall weight depending on the module (see Module Assessment).
- **PRACTICALS AND SEMINARS:** Assessment of classroom sessions and seminars through oral

presentations, written tests, multiple-choice items or restricted essay questions, with an approximate weight depending on the module (see Module Assessment).

Attendance and active participation in class and seminars: approximately 5% overall weight.

Non-attendance at any or all parts of the final exam will result in a "Not assessable" grade.

MODULE ASSESSMENT

Cell Biology Module Assessment:

THEORY AND SEMINARS (60%):

- The assessment consists of a final multiple-choice exam with a single correct answer and/or short conceptual and reasoning questions. To pass the Cell Biology module in the first sitting, the exam mark must be above 5. If the mark is below 5, students may take the resit exam. This may be a multiple-choice or short-answer conceptual exam. The resit also allows students who wish to improve their grade to do so. In this case, sitting the resit implies renouncing the previous exam grade.

CLASSROOM PRACTICAL SESSIONS (40%):

- The group project will be assessed through a public oral presentation of one of the proposed diseases (40% of the activity). In addition, the level of understanding of the disease developed by the student's group will be assessed (40%), as well as the understanding of the other diseases presented by other groups (20%). This last part will be assessed through a 10-12 multiple-choice question test held on the same day as the final exam. In case of second or subsequent enrolment, students do not need to repeat the activity provided that the grade is 5 or higher. In such cases, the previously obtained grade is carried forward for final calculation. In other words, the activity grade is retained for repeating students.

Important: The grade obtained in the final or resit exam must be at least 5 in order to average with the classroom practical activity grade.

The final grade for the Cell Biology module represents 33.3% of the overall course grade.

Biochemistry Module Assessment:

THEORY (70-100%):

- Final exam including a multiple-choice test and a conceptual/problems section. The average of both parts constitutes the exam grade.

SEMINARS (0-30%):

- Continuous assessment exercises associated with seminars. The continuous assessment grade is only taken into account when it is higher than the final exam grade, and therefore it can increase the final mark.

The final grade for the Biochemistry module represents 33.3% of the overall course grade.

Histology Module Assessment:

THEORY EXAM (50%):

- Final true/false multiple-choice exam and image interpretation questions. A minimum grade of 5 is required to pass the course.

CONTINUOUS ASSESSMENT ACTIVITIES (50%):

- Moodle classroom: continuous assessment exercises linked to seminars via Moodle and/or Teams (20%).
- Practical sessions: continuous assessment tests carried out during practical sessions on theoretical concepts and image interpretation (30%).

To pass the module (exam + continuous assessment activities), minimum requirements for each part must be met and a final grade of at least 5 must be obtained after applying the weighting. If the theory exam is not passed, a final exam with the same characteristics as the midterm exam will be held.

The final grade for the Histology module represents 33.3% of the overall course grade.

ADDITIONAL CONSIDERATIONS

The use of Artificial Intelligence (AI) technologies is allowed in this course as part of the development of assignments, provided that the final outcome reflects a significant contribution from the student in terms of analysis and personal reflection. Students must clearly identify which parts have been generated using these technologies, specify the tools used, and include a critical reflection on how they influenced the process and the final outcome. However, the use of AI technologies is not permitted during individual assessment tests (exams, written or oral tests), which must be completed without external support unless explicitly stated otherwise in the assessment call. Lack of transparency regarding AI use will be considered academic dishonesty and may result in grade penalties or more severe sanctions in serious cases.

Any irregularity in an assessment activity (academic fraud, plagiarism, or improper use of AI, unless expressly authorised in the course syllabus) that may significantly affect the grade will result in a score of 0 for that activity. If the syllabus states that a minimum grade in that activity is required to pass the course, or if multiple irregularities occur within the same course, the final course grade will be 0. In addition, disciplinary proceedings may be initiated against the student involved in such irregularities.

Bibliography

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Software

The use of software is not required in this course.

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	101	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	101	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	101	Catalan	first semester	morning-mixed
(SEM) Seminars	101	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	102	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	102	Catalan	first semester	morning-mixed
(SEM) Seminars	102	Catalan	first semester	morning-mixed
(PAUL) Classroom practices	103	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	103	Catalan	first semester	morning-mixed
(SEM) Seminars	103	Catalan	first semester	morning-mixed
(PLAB) Practical laboratories	104	Catalan	first semester	morning-mixed
(SEM) Seminars	104	Catalan	first semester	morning-mixed