

Teaching guide

IDENTIFICATION DETAILS

Degree:	Biomedicine		
Scope	Biology and Genetics		
Faculty/School:	Experimental Sciences		
Course:	CLINICAL BIOCHEMISTRY		
Type:	Compulsory	ECTS credits:	4,50
Year:	4	Code:	2161
Teaching period:	Seventh semester		
Subject:	General Principles of Disease		
Module:	Foundations of Biomedicine		
Teaching type:	Classroom-based		
Language:	Spanish		
Total number of student study hours:	112,50		

SUBJECT DESCRIPTION

The subject of Clinical Biochemistry is taught in the seventh semester of the Degree in Biomedicine on a compulsory basis and is included in the module on fundamentals of biomedicine. During the previous three years, the student has acquired solid knowledge of Biochemistry and Molecular Biology, Microbiology, Human Physiology and General Pathology, which will allow them to enter the field of Clinical Biochemistry.

Clinical Biochemistry studies the different biochemical and molecular methods that make it possible both to diagnose metabolically based diseases and to detect biochemical changes specific to certain pathologies. The main applications of clinical biochemistry are diagnosis, prognosis, disease progression monitoring and population screening.

This course will deepen the molecular knowledge of the different pathologies and the study of the development of the different biochemical and molecular tests that allow us to analyze these pathologies.

GOAL

The main objective of the clinical biochemistry course is to acquire the basic knowledge to be able to understand and analyze at the molecular level the different pathologies and the possible biochemical and molecular follow-up of these diseases, encouraging the search for new analysis alternatives that allow an improvement in diagnosis and treatment. To this end, we will deepen our knowledge of: - The molecular bases of the most common pathologies. - The technological bases of the main biochemical and molecular tests used in the clinic. - The applications of biochemical and molecular analysis technologies in different pathologies. - Research at the molecular level of different pathologies.

PRIOR KNOWLEDGE

Prior knowledge of the basic training of the Biomedicine degree is required, mainly in the area of Human Physiology, Structural Biochemistry, Metabolism, Genetics, Microbiology, Molecular Biology and General Pathology.

COURSE SYLLABUS

Topic 1: Introduction to clinical biochemistry. Topic 2: Interpretation of results and management of the clinical laboratory. Theme 3: Pre-analytical phase. Topic 4: Electrolyte disorders. Topic 5: Blood gases and acid-base balance. Topic 6: Calcium and Phosphate Metabolism. Topic 7: Trace elements and hemoporphyrins. Topic 8: Metabolic disorders. Topic 9: Disorders in the endocrine system. Topic 10: Disorders in the digestive and excretory systems. Topic 11: Disorders in the musculoskeletal system. Topic 12: Nutritional disorders. Theme 13: Special Studies. Topic 14: Disease Screening.

EDUCATION ACTIVITIES

Most of the activities will consist of expository classes on the subject's syllabus by the teacher. These classes will be structured in the presentation of the problem, analysis of the technology to be applied and interpretation of results. Practical classes will also be held with exhibition seminars by students, showing, based on a scientific publication on a specific pathology, the assimilation of the theoretical part of the subject, the appropriate interpretation of the results and the vision of the translation of research to the treatment of clinical pathologies. Finally, students will have personalized tutoring aimed at resolving questions about the subject, its study and its evaluation.

DISTRIBUTION OF WORK TIME

TEACHER-LED TRAINING ACTIVITIES	INDIVIDUAL WORK
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LEARNING RESULTS

To know the possible alterations in the metabolic pathways that cause pathology in the human being and their symptomatology.

Know the biochemical, cytogenetic and molecular biology markers applied to clinical diagnosis.

To know the fundamentals of the response of cells and organs of the human body to injury, from a molecular, systemic and clinical perspective.

To know the changes in cellular and systemic physiology that take place in the most prevalent diseases in our society.

To know the pathophysiological processes as well as their manifestations and risk factors affecting health and disease in the human body throughout the life cycle.

Know the different laboratory instruments and materials (biological and non-biological) and their obtaining and handling for different purposes, observing the necessary safety principles.

Understand how homeostasis is integrated with processes such as inflammation, fibrosis or neoplasia to explain the development of physiopathology based on physiological regulatory mechanisms.

SPECIFIC LEARNING RESULTS

Integrate the knowledge acquired in Biochemistry, Molecular Biology, Microbiology and Pathophysiology into the understanding of the molecular basis of diseases.

Interpret biochemical analyses within a given clinical picture and identify the different pathologies according to a specific biochemical profile.

Assimilate the methodological bases of the different technologies applied in clinical biochemistry.

Describe the main molecular alterations detected in ordinary clinical practice.

Interpret correctly the different biochemical tests performed in the clinic.

Describe the basis for the validation of clinical biochemistry tests.

Propose an appropriate biochemical diagnostic and follow-up approach for different pathologies.

Discover, contrast and critique the scope of clinical applicability of each biochemical methodology and analyze its clinical limitations.

Analyze and criticize the scientific rigor of scientific articles on clinical biochemistry, concluding on the scientific contribution and predicting possible future areas of study.

LEARNING APPRAISAL SYSTEM

Ordinary evaluation system: - Evaluation of theoretical content: through partial and final face-to-face exams with test-type questions, short answers or development (65%). - Evaluation of practical content or group work: through expository seminars for cooperative learning based on problems presented in scientific articles (25%). - Evaluation of seminars, attendance and participatory work: through class attendance, participation in classes, forums and in cooperative learning work (10%). It is necessary to obtain a score of 4.5 out of 10 in the evaluation of the theoretical content to apply the weighting of the grades. It is necessary to obtain a minimum score of 4 in each of the two parts of the final exam of the theoretical content to apply the weighting of each part in the overall grade. Alternative evaluation system: - Students in second or subsequent enrollment must contact the teacher to request to take advantage of this system. Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with those established in the Evaluation Regulations and the University's Coexistence Regulations.

ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following principles:

- a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.
- b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.
- c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website(https://www.ufv.es/gestion-de-la-informacion_biblioteca/).
- d) The results obtained through AI systems or services must always be verified. As the author, the student is responsible for their work and for the legitimacy of the sources used.

2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the [Guide for the Responsible Use of Artificial Intelligence in Studies at UFV](#). Additionally, the lecturer may request other types of individual commitments from the student when deemed necessary.

3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

BIBLIOGRAPHY AND OTHER RESOURCES

Basic

González, Hernández A. Principles of Clinical Biochemistry and Molecular Pathology. 3 Elsevier, 2019
(González, Hernández A. Principles of Clinical Biochemistry and Molecular Pathology. 3 Elsevier, 2019 ,
||Marshall W., Lapsley M., Day A., Ayling R. Clinical Biochemistry: Metabolic and Clinical Aspects. 3 Elsevier, 2014

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Additional

Scientific publications provided by the professor. Scientific journals of clinical biochemistry with high impact.