CLINICAL PHYSIOLOGY AND BIOCHEMISTRY

Approved by the Council of the Department of Physiology on 11th April 2019
Approved by the Council of the Department of Biochemistry on

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<td>4th</td>
<td>2nd semester</td>
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LECTURER(S)

CLINICAL PHYSIOLOGY
1. Francisco Lisbona Delgado (Groups A and C)
2. Mª Inmaculada López Aliaga (Group D)
3. Mª José Muñoz Alférez (Group E)
4. Ana Soriano Lerma (Group E)
5. Marta de la Flor Alemany (Group E)

CLINICAL BIOCHEMISTRY
1. José Luis Periago Mínguez (Groups C and E)
2. Mª Dolores Mesa García (Groups A and D)

DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT
Degree in Pharmacy

TUTORING
http://www.ugr.es/~fisiougr/tutorias.php
http://farmacia.ugr.es/BBM2/

PREREQUISITES and/or RECOMMENDATIONS
- It is recommended to have a previous basic knowledge (background knowledge) of Human and Cell Physiology (I and II), Physiopathology, Structural Biochemistry, Metabolic Biochemistry and Human Anatomy.
- A good level of English and Informatics skills are also required.
- Ability to process and to elaborate documents in virtual format and on paper.

BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE GUIDE)

**GENERAL AND PARTICULAR ABILITIES**

**GENERIC SKILLS:**

- CG9. To participate in the activities of promotion of the health, prevention of disease, in the individual, familiar and community area; with the integral and multiprofessional vision of the process health - disease.
- CG10. To design and to evaluate reagents, methods and analytical clinical technologies, knowing the basic foundations of the clinical analyses and the characteristics and contents of the laboratory diagnosis.
- CG13. To develop skills of communication and information, both oral and written, to deal with patients and users of the center where to perform his professional activity. To promote the capacities of work and collaboration in multidisciplinary teams and the related ones to other sanitary professionals.
- CG15. To recognize the own limitations and the need to support and update the professional career, giving special importance to the independent learning of new knowledge being based on the scientific available evidence.

**SPECIFIC SKILLS:**

- CE36. To know and understanding the basic foundations of the clinical analyses, the characteristics and contents of the results of the main clinical laboratory tests.
- CE39. To know and understanding the technologies and skills used in the design and evaluation of the preclinical and clinical tests.
- CE49. To know the analytical technologies and skills related to the laboratory diagnostics.

**OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)**

- To integrate the knowledge obtained in the Clinical subjects of Physiology and Biochemistry.
- To interpret the laboratory tests used in the diagnosis and follow-up of common diseases.
- To apply the interpretation of laboratory information in the follow-up of the efficiency and of the therapeutic safety.
- To be able to accomplish of reports with the results of the physiological and biochemical diagnosis of laboratory.
- To introduce the specialization in the clinical matters of Clinical Analyses, Clinical Biochemistry, Microbiology and Clinical Parasitology.

**DETAILED SUBJECT SYLLABUS**

**THEORETICAL PROGRAM**

**BLOCK I. CLINICAL PHYSIOLOGY**

**THEMATIC UNIT 1. METHODS OF BLOOD’S EXTRACTION (1.5 h.)**

THEMATIC UNIT 2. HEMATOPOYETIC ORGANS (1.5 h.)
Blood cells, origin, differentiation and cellular maturation. Morphologic characteristics of the blood cells.

THEMATIC UNIT 3. BASIC HEMATOMETRY

THEMATIC UNIT 4. INTRODUCTION TO THE STUDY OF THE ERITROCITARY PATHOLOGY (1 h.)

THEMATIC UNIT 5. MICROCYTIC ANEMIAS (3 h.)

THEMATIC UNIT 6. MACROCYTIC ANEMIAS (1 h.)
Megaloblastic anemias by vitamin B12 and folic acid deficiency. Non-megaloblastic macrocytic anemias.

THEMATIC UNIT 7. NORMOCYTIC ANAEMIAS (2 h.)

THEMATIC UNIT 8. INTRODUCTION TO THE STUDY OF THE LEUKOCITARY FUNCTIONALISM (2 h.)

THEMATIC UNIT 9. CHRONIC MYELOPROLIFERATIVE SYNDROMES (1 h.)
Chronic myeloid leukaemia. Chronic myeloproliferative syndromes with hemo-peripheral expression. T and B-cell chronic lymphocytic leukaemia.

THEMATIC UNIT 10. CLASSIFICATION OF THE ACUTE LEUKAEMIAS (1 h.)
Secondary acute leukaemias. Linfoproliferative syndromes without hemo-peripheral expression. Lymphomas and myelomas.

THEMATIC UNIT 11. HEMOSTASIS: COAGULATION AND FIBRINOLYSIS (1.5 h.)
Elements that intervene in the hemostasis. Platelets. Plasmatic factors of the coagulation and fibrinolytic system. Analytical tests of the exploration of the different components.

THEMATIC UNIT 12. FUNCTIONAL ALTERATIONS OF THE PLATELETS (1.5 h.)

THEMATIC UNIT 13. RENAL FUNCTION: PRINCIPLES OF THE RENAL CLEARANCE (1 h.)
Methods to determine the renal clearance. Measures of glomerular filtration, renal blood flow and effective renal plasma flow. Tubular function tests. Dilution and concentration tests.

THEMATIC UNIT 14. EXAMINATION OF THE ACID-BASE BALANCE (1 h.)
Arterial gasometry. Interpretation of information in respiratory and metabolic acidosis. Respiratory and metabolic alkalosis. Effects of compensation.

THEMATIC UNIT 15. CEPHALORAQUID LIQUID (1 h.)
Biochemical tests

THEMATIC UNIT 16. SEMINAL FLUID (1 h.)
Functional tests

BLOCK II. CLINICAL BIOCHEMISTRY

THEMATIC UNIT 1. CLINICAL BIOCHEMISTRY.
Diagnostic semantics. Analytical and biological variability control.

THEMATIC UNIT 2. HYPERGLYCEMIA AND HYPOGLYCEMIA. Diagnosis and monitoring of the diabetic patient.

THEMATIC UNIT 3. LIPOPROTEINS. Evaluation of the atherogenic risk.


THEMATIC UNIT 5. DISPROTEINEMIAS AND DIAGNOSTIC TECHNIQUES.

THEMATIC UNIT 6. CLINICAL ENZYMEOLOGY.

THEMATIC UNIT 7. BIOCHEMICAL RISK MARKERS OF THE HEPATIC FUNCTION

THEMATIC UNIT 8. TUMORAL BIOCHEMICAL RISK MARKERS

THEMATIC UNIT 9. HEREDITARY DISEASES.

THEMATIC UNIT 10. BIOCHEMICAL ASSESSMENT IN DIFFERENT PHYSIOLOGICAL SITUATIONS.

LABORATORY PRACTICE PROGRAM

BLOCK I. CLINICAL PHYSIOLOGY

Practice 1. Blood cells count: red cells, white cells and platelets
Practice 3. Leucocitary formula.
Practice 4. Reticulocyte count.

BLOCK II. CLINICAL BIOCHEMISTRY

Practice 1. Total cholesterol, HDL-cholesterol and triacylglycerides determination
Practice 2. Uric acid, urea and creatinin determination
Practice 3. GPT and GOT determination

READING

FUNDAMENTAL BIBLIOGRAPHY:
PHYSIOLOGY


BIOCHEMISTRY

- Gaw, Cowan, O´Reilly, Bioquímica Clínica. Ed Harcourt
- Ruiz Reyes, Ruiz Argüelles. Fundamentos de interpretación clínica de los exámenes de laboratorio. Ed Panamericana
- Sánchez de Medina Contreras F, Sánchez Pozo A, Suárez Ortega MD. Apuntes de Bioquímica Clínica. ICE, Universidad
- González A. Principios de Bioquímica Clínica y Patología Molecular. Elsevier España 2010

COMPLEMENTARY BIBLIOGRAPHY:

**RECOMMENDED INTERNET LINKS**

**PHYSIOLOGY**

- Anemia_ Pathophysiology, Classification, Clinical Investigation
- Interactive Basic Hematology https://hemeteam.com/
- The Medical Biochemistry http://web.indstate.edu/thcme/mwking/blood-coagulation.html#intro
- Bloodline http://www.bloodline.net/
- Hematopathology Index Medscape http://www.medscape.com/index/section_154_0
- American Society of Haematology https://www.ashacademy.org/Product/TeachingCasesList
- http://www.the-aps.org/ The American Physiological Society
- http://physoc.org/ The Physiological Society
- http://www.seccff.org/ Sociedad Española de Ciencias Fisiológicas
- http://www.feps.org/ Federación Europea de Sociedades de Fisiología

**BIOCHEMISTRY**

- http://www.biorom.uma.es/indices/index.html (Página con contenidos relacionados con Bioquímica y especialmente metabolismo. Incluye presentaciones de clase, problemas y preguntas tipo test)

**ADDITIONAL INFORMATION**

Information about the subject can be consulted in the following web pages:

Department of Physiology: http://www.ugr.es/~fisiougr/
Department of Biochemistry and Molecular Biology II: http://farmacia.ugr.es/BBM2/

According to the Students Assessment and Qualification Policy of the University of Granada (adopted by the Governing Council on Oct 26, 2016), those students who cannot follow the continuous assessment system due to working, health or disability issues (or any other reason appropriately justified) can apply for a Single Final Assessment. For this purpose, the student will submit a formal request to the Director (Head) of the Department, arguing and proving (with documented evidence) the reason for not being able to follow the
continuous system. The submission deadline will be 2 weeks after the beginning of the lectures. In extraordinary circumstances, the starting date for counting the 2-week period will be the enrolment date (policy NCG78/9) and, in this case, the student will have to include the proof of enrolment date when making the request. After ten days without the student receiving a written reply from the Director of the Department, it will be understood that the request has been deemed. In case of denial, the student may file, within one month, an appeal to the Rector, who may delegate this task to the Dean or Director of the Centre, exhausting the administrative proceedings.