<table>
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<th>MODULE</th>
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<tr>
<td>MEDICINE AND PHARMACOLOGY</td>
<td>CLINICAL PHYSIOLOGY AND BIOCHEMISTRY</td>
<td>4th</td>
<td>2nd semester</td>
<td>6 ECTS (4.5 T + 1.5 P)</td>
<td>Compulsory</td>
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**LECTURER(S)**

***Clinical Physiology***

1. Francisco Lisboa Delgado (A and C)
2. Mª Inmaculada López Aliaga (D)
3. Javier Díaz Castro (E)
4. Mª José Muñoz Alférez (E)

***Clinical Biochemistry***

1. José Luis Periago Minguez (A and E)
2. Mª del Mar Sola Zapata (C)
3. Mª Dolores Mesa García (D)

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**DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT**

**TUTORING AND MEETINGS**

**Degree in Pharmacy**

Teachers of Clinical Physiology:
- Francisco Lisboa Delgado:
  - M, W and F: 9:30-11:30 h.
- Mª Inmaculada López Aliaga:
  - T and Th: 12:30-14:30 h.; W: 10:30-12:30 h.
- Javier Díaz Castro:
  - T and Th: 16:00-18:00; F: 16:00-17:00 y 18:00-19:00 h.
- Mª José Muñoz Alférez:
  - M and Th: 9:30-11:30 h.; W: 10:30-12:30 h.

Teachers of Clinical Biochemistry

http://farmacia.ugr.es/BBM2/index.html
PREREQUISITES and/or RECOMMENDATIONS (if necessary)

- 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)

Introduction to laboratory diagnosis of common diseases. Clinical Physiology, Clinical Biochemistry and Molecular Pathology.

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 I. METHODS OF BLOOD’S EXTRACTION (1.5 h.)

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

THEMATIC UNIT 3: BASIC HEMATIMETRY

THEMATIC UNIT 4: INTRODUCTION TO THE STUDY OF THE ERITROCYTARY PATHOLOGY (1 h.)
Anemias, classification of anemias for basic hematimetry. Anemias microcytosis, macrocytosis and normocytosis. Physiopathological classification: Regenerative and arregenerative anemias

THEMATIC UNIT 5: MICROCYTIC ANEMIAS (3h.)

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 leukemias. Linoproliferative 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 (0.5 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: CEPHALORADUGUID LIQUID (1 h.)
Formation, circulation and composition. Obtaining sample. Cells count and leucocitary formula. Biochemical tests

THEMATIC UNIT 16: SEMINAL FLUID (1 h.)
LABORATORY PRACTICE PROGRAM

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

BLOCK II. CLINICAL BIOCHEMISTRY

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

THEMATIC UNIT 2. MOLECULAR PATHOLOGY AND DIAGNOSTIC TECHNIQUES.

THEMATIC UNIT 3. HYPERGLYCEMIA AND HYPOGLYCEMIA. Diagnosis and monitoring of the diabetic patient.

THEMATIC UNIT 4. LIPOPROTEINS. Evaluation of the atherogenic risk.

THEMATIC UNIT 5. ALTERATIONS OF THE NON-PROTEIN NITROGENOUS METABOLISM: urea, uric and creatinin. Pathological consequences and diagnostic techniques. No-protein nitrogenous and renal function

THEMATIC UNIT 6. DISPROTEINEMIAS AND DIAGNOSTIC TECHNIQUES.

THEMATIC UNIT 7. CLINICAL ENZYMOLGY.

THEMATIC UNIT 8. BIOCHEMICAL RISK MARKERS OF THE HEPATIC FUNCTION

THEMATIC UNIT 9. TUMORAL BIOCHEMICAL RISK MARKERS

LABORATORY PRACTICE PROGRAM

Practice 1. Glucose determination
Practice 2. Total cholesterol, HDL-cholesterol and triacylglycerides determination
Practice 3. Uric acid, urea and creatinin determination
Practice 4. GPY and GOT determination

READING

FUNDAMENTAL BIBLIOGRAPHY:

- RUIZ REYES G. y RUIZ ARGÜELLES A. Fundamentos de Interpretación Clínica de los Exámenes de Laboratorio. 2ª Edición. Editorial Médica Panamericana,
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**Complementary Bibliography:**


**Recommended Internet Links**

- Blood Outline: [http://www.mc.vanderbilt.edu/histo/blood/](http://www.mc.vanderbilt.edu/histo/blood/)
- Bloodline: [http://www.bloodline.net/](http://www.bloodline.net/)
- Hematopathology Index: [http://www.medlib.med.utah.edu/WebPath/HEMHTML/HEMEIDX.html#2](http://www.medlib.med.utah.edu/WebPath/HEMHTML/HEMEIDX.html#2)
- Metal Complex in the Blood: [http://wunmr.wustl.edu/EduDev/LabTutorials/Hemoglobin/MetalComplexinBlood.html](http://wunmr.wustl.edu/EduDev/LabTutorials/Hemoglobin/MetalComplexinBlood.html)
- Pathology_Hematology Procedures: [http://medic.med.uth.tmc.edu/path/00000286.htm](http://medic.med.uth.tmc.edu/path/00000286.htm)

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
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)

Información sobre la asignatura puede ser consultada en la página web del Departamento de Bioquímica y Biología Molecular II: [http://farmacia.ugr.es/BBM2/](http://farmacia.ugr.es/BBM2/).