

## PATOPHYSIOLOGY

(approved by the Council of the Department of Physiology on 22<sup>nd</sup> May, 2017)

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
Medicine and Pharmacology	Pathophysiology	2 <sup>nd</sup>	2 <sup>nd</sup>	6 ECTS	Required (Mandatory)
LECTURER(S)			Postal address, telephone n <sup>o</sup> , e-mail address		
<b>Department of Physiology Theory</b> Elena Planells Del Pozo Cristina Sánchez González M <sup>a</sup> Alba Martínez Burgos <b>Practice</b> Carlos de Teresa Galván  <b>Department of Medicine (theory and practice)</b> Luis Aliaga Martínez Francisco Martí Jiménez			Department of Physiology, School of Pharmacy, Cartuja Campus*  Phone number: +34 958 243879  <a href="mailto:elenamp@ugr.es">elenamp@ugr.es</a> , <a href="mailto:crissg@ugr.es">crissg@ugr.es</a> , <a href="mailto:malbam@ugr.es">malbam@ugr.es</a> , <a href="mailto:cdeteresa@ugr.es">cdeteresa@ugr.es</a> , <a href="mailto:laliaga@ugr.es">laliaga@ugr.es</a> , <a href="mailto:fmarti@ugr.es">fmarti@ugr.es</a>  *Tutoring will be located at this address unless otherwise stated (see below)		
<b>DEGREE WITHIN THE SUBJECT IS TAUGHT</b>			<b>TUTORING AND MEETINGS</b>		
Degree in Human Nutrition and Dietetics			Elena Planells del Pozo T and Th: 10.30-13.30 h  Cristina Sánchez González M: 11.30-14.30 h: T: 12.30-14.30 h and 16.00-17.00 h  Maria Alba Martínez Burgos T and Th: 9.00-12.00 h  Carlos de Teresa Galván M: 15.00-16.00 h and 19.00-20.00 h T, W, Th and F: 15.00-16.00 h  Luis Aliaga Martínez F: 9.00-14.00 h (room 05, building B, 6th floor, Fac. Medicine, PTS).		



Francisco Martí Jiménez  
F: 10.00-12.00 h (Department of Medicine,  
Faculty of Medicine)

#### PREREQUISITES and/or RECOMMENDATIONS (if necessary)

**Prerequisites:** Those necessary to access to the degree, related with the level of formation that the student must acquire to accede to the University.

**Recommendations:** To have previous basic knowledge (background knowledge of Chemistry, Biology, Anatomy and Histology, Biochemistry (I and II), Cellular and Human Physiology. A good standard of English and informatics skills are also required.

#### BRIEF ACCOUNT OF THE SUBJECT PROGRAMME

General aspects of pathophysiology. Dysfunction and disorders of the musculoskeletal system, cardiovascular system, respiratory system, gastrointestinal system, renal system, nervous system, and hormonal systems.

#### BASIC, GENERAL AND CROSS COMPETENCES

CB2: Students can apply their knowledge to their work or vocation in a professional manner and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study.

CB3: Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection on relevant social, scientific or ethical.

CG13: Integrate and evaluate the relationship between diet and nutrition in health and disease states.

CG14: Apply scientific knowledge of physiology, pathophysiology, nutrition and food to planning and dietary advice to individuals and communities, throughout the life cycle, both healthy and sick.

CG29: Acquire basic training for the research activity, being able to formulate hypotheses, collect and interpret information for problem solving using the scientific method, and understanding the importance and limitations of scientific thinking in health and nutrition.

CT1: Understand and master a foreign language.

CT2: Ability to use ICT with ease.

CT3: Ability to search for employment and entrepreneurial capacity

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

At the completion of the course the student should be able to:

- Describe the functional alterations in specialized organs and tissues that are responsible for disorders that involve these organs, as well as the etiopathogenic mechanism involved in the alterations, and the symptomatology of each disease.



- Describe the adequate response of human body against the modifications exerted by agents causing internal or external injury.
- Comprehend the concepts of health and disease
- Comprehend the pathophysiological substrate of disease
- Describe the compensatory mechanism to maintain system homeostasis under pathological conditions
- Relate these concepts with previous knowledge and acquire the scientific base for more elaborate posterior knowledge

#### DETAILED SUBJECT TOPICS

##### **THEMATIC UNIT I: INTRODUCTION AND GENERAL PATHOPHYSIOLOGY**

Module 1: Normal and pathologic function

Module 2: Cellular responses to stress and toxic insults. Alterations in cell physiology I: Apoptosis and ageing.

Module 3: Cellular responses to stress and toxic insults. Alterations in cell physiology II: Necrosis and environmental diseases.

Module 4: Acute and chronic inflammation

##### **THEMATIC UNIT II: BLOOD**

Module 5: Pathophysiology of Erythrocytes.

Module 6: Pathophysiology of Leukocytes.

Module 7: Pathophysiology of hemostasis and thrombosis.

##### **THEMATIC UNIT III: DIGESTIVE SYSTEM**

Module 8: Disorders of gastrointestinal motility/transit.

Module 9: Disorders of gastric and intestinal secretions.

Module 10: Symptomatology of digestive pathology.

Module 11: Syndromes of gastrointestinal tract pathology.

Module 12: Syndromes of liver, biliary tract and pancreas pathology.

##### **THEMATIC UNIT IV: ENDOCRINE SYSTEM**

Module 13: Pathophysiology of growth. Alterations of the hypothalamic-pituitary axis

Module 14: Pathophysiology of Thyroid gland. Goiter. Hyperfunction, hypofunction.

Module 15: Alterations in calcium and phosphate metabolism.

Module 16: Alterations of suprarenal cortex function.

Module 17: Alterations of glucidic and lipidic metabolism.

Module 18: Alterations of protein and amino acid metabolism.

##### **THEMATIC UNIT V: REPRODUCTIVE SYSTEM**

Module 19: Alterations in sex differentiation and development.

Module 20: Disorders of testicular function.

Module 21: Disorders of ovary function.

##### **THEMATIC UNIT VI: CARDIOVASCULAR SYSTEM**

Module 22: Pathophysiology of valve malfunction. Valvular heart disease.



Module 23: Pathophysiology of heart bit rate and rhythm disorders. Cardiac arrhythmia  
Module 24: Pathophysiology of coronary circulation.  
Module 25: Pathophysiology of arterial blood pressure.  
Module 26: Cardiac insufficiency. Pathophysiology of the pericardium.  
Module 27: Acute circulatory failure.  
Module 28: Pathophysiology of peripheral vascular system.

#### **THEMATIC UNIT VII: RESPIRATORY SYSTEM**

Module 29: Respiratory failure I: Classifications. Symptomatology. Obstructive lung disease.  
Module 30: Respiratory failure II. Restrictive lung disease.  
Module 31: Pathophysiology of pulmonary circulation.  
Module 32: Alterations of respiratory rhythm and pattern.

#### **THEMATIC UNIT VIII: RENAL SYSTEM**

Module 33: Alterations of glomerular and tubular functions.  
Module 34: Acute and Chronic renal failure.  
Module 35: Pathophysiology of the urinary tract.  
Module 36: Acid-base metabolism disorders.

#### **THEMATIC UNIT IX: MUSCULOSKELETAL SYSTEM**

Module 37: Pathophysiology of muscle.  
Module 38: Pathophysiology of bone.  
Module 39: Pathophysiology of joints.

#### **THEMATIC UNIT X: SYSTEMIC PATHOPHYSIOLOGY: THE NERVOUS SYSTEM**

Module 40: Pathophysiology of sensory function  
Module 41: Pathophysiology of peripheral, medular and brain stem alterations. Pathophysiology of the upper and lower motor neuron.  
Module 42: Pathophysiology of motor coordination.  
Module 43: Pathophysiology of basal ganglia.  
Module 44: Pathophysiology of Autonomic Nervous System. Mood alterations.  
Module 45: Pathophysiology of cerebral cortex.  
Module 46: Alterations of consciousness, epilepsies, and sleeping disorders

#### **PRACTICAL LABORATORY CLASSES**

Group work sessions in the laboratory supervised by the lecturer. Meaningful construction of knowledge through interaction and student activity. Assistance is required. Students will use a pathophysiology laboratory notebook provided by the Department of Physiology in which they will annotate the results and complete the different exercises and problems proposed. Upon completion of the practical laboratory classes, the laboratory notebook will be evaluated by the instructor and it will count as part of the practical laboratory grade.

The practical classes at the laboratory will be taught as follows:

**Practical session 1.** Pathophysiology of the digestive system. Pathophysiology cases: Lactose



intolerance, peptic ulcer.

**Practical session 2.** Pathophysiology of the endocrine system. Altered metabolism of carbohydrates and lipids. Pathophysiology cases: Hyperglycemia Diabetes mellitus type I and II.

**Practical session 3.** Pathophysiology of cardiac and respiratory systems. Cardiopulmonary resuscitation.

## SYSTEM FOR ASSESSING THE ACQUISITION OF THE COMPETENCES AND KNOWLEDGE

### CONTINUOUS ASSESSMENT

- Evaluation of theoretical contents: by performing 2 partial exams.
- Evaluation of seminars: through the realization and presentation of the same, valuing the knowledge, clarity in the presentation, capacity of communication, bibliography used, etc.
- Evaluation of laboratory practices: with the accomplishment of a written examination to evaluate the contents and the valuation of the knowledge, by the supervision of results obtained in each practice.
- Daily accounting of attendance

COMPETENCES	EVALUATION SYSTEMS	% FINAL CALIFICATION
Theory: controles periódicos (CG9, CG15, CEM5.13)	SE.1 SE.2 SE.3 SE.4 SE.13	approximately 70
Practices: Realization and exhibition of seminars (CG13, CEM5.13)	SE.5 SE.6 SE.11 SE.12	approximately 10
Practices: Discussion of clinical cases (CG13, CEM5.13)	SE.7 SE.8 SE.9 SE.10 SE.13 SE.15	approximately 10
Attendance to class with use (CG9, CG15, CEM5.13)	SE.13 SE.15	Approximately 10

### SINGLE FINAL ASSESSMENT

According to the Students Assessment and Qualification Policy of the University of Granada, the evaluation will preferably be continuous, this being understood to be the diversified evaluation established in the Teaching Guides of the subjects. Nevertheless, a single final evaluation system is contemplated for those students who cannot comply with the continuous assessment one due to working, health or disability issues (or any other duly justified cause). In accordance with article 8 of the aforementioned regulations, in order to take advantage of the single final evaluation regime, 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 two weeks after the beginning of the lectures (or two weeks after the enrolment date if this was later than the beginning of the lectures). 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.



The final mark in the single final assessment system will be calculated according to the percentages:

Theoretical classes: 90%

Practical classes: 10%

Evaluation of theoretical contents:

Students will be evaluated through a final exam. The final exam will be scored on 10 and a score of 5 points or higher will be required in order to pass the subject. Theoretical material will account for up to 90% of the final grade.

Evaluation of laboratory practices: Students must pass a practical exam that will involve carrying out one of the practices (randomly chosen) of the practice notebook, as well as answering to several questions about the different practices of the notebook. The practice mark will represent up to 10% of the final mark.

#### ADDITIONAL INFORMATION

The dates of exams can be consulted in the official website of the Degree (<http://grados.ugr.es/nutricion/>)



## BIBLIOGRAPHY

### PRINT BOOKS ON PHYSIOLOGY

#### KEY REFERENCES:

- Braun C.A. and Anderson C.M. Pathophysiology. A clinical approach. 2nd Edition. Ed. Lippincott Williams & Wilkins, Barcelona. 2011.
- J. García Conde, J. Merino Sanchez, General Pathology Glez J. Macias: Semiotics and Clinical Pathophysiology. 2nd Edition. Ed American - Mc Graw-Hill. Madrid. 2003.
- Perez Arellano Sicinius JL Castro, Manual of General Pathology. 6th Edition Ed. Masson S.A. Barcelona. 2006.
- Buja L. M. and Krueger G.R.F. Netter. Pathology. 1st Edition. Ed. Masson, S.A. Barcelona. 2006.
- Kumar Abbas. Robbins and Cotran. + StudentConsult structural and functional pathology. Ed. Elsevier. 2015.
- Porth S. and C. M. Grossman Health disorders. Basic concepts. 9th Edition. Ed. Lippincott Williams & Wilkins. Barcelona. 2014.
- Pastrana J. Delgado Sánchez and García de Casasola G. Pathophysiology and pathology basic health sciences general. 1st Edition. Editorial Elsevier. Barcelona. 2013.

#### FURTHER READING:

- Ullmann H.F. Atlas of Anatomy. 1st Edition. Ed. Elsevier. China 2009
- Terminological dictionary of medical sciences. 13th Edition. Ed. Masson, S.A. Barcelona 2002.

#### RECOMMENDED INTERNET LINKS

<http://www.ugr.es/local/fisioaai>

