

**COURSE DATA****DATA SUBJECT****Code:** 33002**Name:** Human physiology**Cycle:** Undergraduate Studies**ECTS Credits:** 9**Academic year:** 2025-26**STUDY (S)**

| Degree | Center | Acad. year | Period |
|--------------------------------|--------------------------|------------|------------------------|
| 1202 - Degree in Physiotherapy | Facultat de Fisioteràpia | 1 | Annual, Second quarter |

SUBJECT-MATTER

| Degree | Subject-matter | Character |
|--------------------------------|----------------|-----------|
| 1202 - Degree in Physiotherapy | Physiology | BASIC |

COORDINATION

SERNA GARCIA EVA

SUMMARY

Study of the functioning of organic control systems in Physical Therapy treatments.

PREVIOUS KNOWLEDGE**RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE**

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

It is recommended to have studied biology in high school.

COMPETENCES / LEARNING OUTCOMES**1202 - Degree in Physiotherapy**

Have the ability to organise and plan work.



Know the human physiology, especially its importance as the basis to understand the process of disease.

Know the methods and interpret the results of the functional examination as related to normal function and, if applicable, to clinically reason the diagnostic impression.

Know the neuromuscular system, its distribution and function on the joints in order to be applied when performing physiotherapy treatments.

Know the physiologic changes caused by the application of physiotherapy, which are the basis for the physiotherapy treatment.

Know the physiologic changes caused by the application of physiotherapy to avoid possible deleterious consequences in specific disease circumstances.

Know the rest of the organic systems, its distribution and function in relation to the organic homeostasis in order to be applied when performing physiotherapy treatments.

Recognise diversity, multiculturalism, democratic values and peace culture.

Recognise equal opportunity and accessibility for people with disability.

Respect fundamental rights and equality between men and women.

Work in teams.

DESCRIPTION OF CONTENTS

1. INTRODUCTION

ITEM 1. INTRODUCTION TO THE STUDY OF PHYSIOLOGY.

2. CELL FUNCTION

MODULE A. CELLULAR COMPOSITION AND CHEMISTRY.

ITEM 2. Chemical composition of the cell.

ITEM 3. Cellular metabolism and their regulatory mechanisms.

ITEM 4. Cellular chemical reactions. Catabolism.

ITEM 5. Cellular chemical reactions. Anabolism.

3. CELL FUNCTION

MODULE B. GENERAL PHYSIOLOGY OF THE CELL.



- ITEM 6. Transport across the cell membrane ..
- ITEM 7. Membrane properties at rest.
- ITEM 8. Action potential and driving. Study of nerve fibers.
- ITEM 9. Introduction to the study of synapses.
- ITEM 10. Catecholaminergic and cholinergic synapses. Other types of synapses.

4. CELL FUNCTION

MODULE B. GENERAL PHYSIOLOGY OF THE CELL.

- ITEM 11. Skeletal muscle contraction.
- ITEM 12. In skeletal muscle metabolism. Thermogenesis.
- ITEM 13. Muscle mechanics and electrophysiology.
- ITEM 14. Properties of muscle.
- ITEM 15. Smooth muscle physiology.

5. ROLE OF EQUIPMENT AND SYSTEMS

MODULE A. PHYSIOLOGY OF THE NERVOUS SYSTEM.

- ITEM 16. Functional organization of the nervous system.
- ITEM 17. Physiology of awareness: general. The sensory receptors.
- ITEM 18. Somatic sensitivity mecanorreceptiva.
- ITEM 19. Tenderness and heat.
- ITEM 20. Locomotor activity: tone and posture.

6. ROLE OF EQUIPMENT AND SYSTEMS

MODULE A. PHYSIOLOGY OF THE NERVOUS SYSTEM.

- ITEM 21. Motor-driven activity: basal ganglia and cerebral cortex
- ITEM 22. Regulation of the visceral.
- ITEM 23. Activation of the brain. Sleep and wakefulness.
- ITEM 24. Higher Functions of the S. Central nervous.

7. ROLE OF EQUIPMENT AND SYSTEMS

MODULE B. PHYSIOLOGY METABOLIC, ENDOCRINE AND DIGESTIVE SYSTEMS.

- ITEM 25. Energy metabolism.
- ITEM 26. Balance in food: regulation of intake.
- ITEM 27. Introduction to the study of hormones.
- ITEM 28. Hormonal regulation of metabolism.
- ITEM 29. Hormonal regulation of growth ..



8. ROLE OF EQUIPMENT AND SYSTEMS

MODULE B. PHYSIOLOGY METABOLIC, ENDOCRINE AND DIGESTIVE SYSTEMS

- ITEM 30. Osteoarticular physiology.
- ITEM 31. Introduction to the digestive.
- ITEM 32. Digestion: motor processes. Defecation.
- ITEM 33. Chemical digestion process.

9. ROLE OF EQUIPMENT AND SYSTEMS

MODULE C. PHYSIOLOGY OF BLOOD.

- ITEM 34. Functional overview of the blood.
- ITEM 35. Physiology of hemostasis

10. ROLE OF EQUIPMENT AND SYSTEMS

D. MODULE PHYSIOLOGY OF THE CIRCULATORY SYSTEM.

- ITEM 36. Introduction to the study of the circulation.
- ITEM 37. Function of the heart pump.
- ITEM 38. Arterial and venous circulation.
- ITEM 39. Physiology of the microcirculation. Lymphatic circulation.
- ITEM 40. Regulation of circulation.

11. ROLE OF EQUIPMENT AND SYSTEMS

D. MODULE PHYSIOLOGY OF THE CIRCULATORY SYSTEM

- ITEM 41. Movement in regions special skin circulation, muscle and brain
- ITEM 42. Movement in special regions: coronary circulation and lung.

12. ROLE OF EQUIPMENT AND SYSTEMS

E. MODULE RESPIRATORY PHYSIOLOGY.

- ITEM 43. Introduction to the study of lung function.
- ITEM 44. Mechanical ventilation.
- ITEM 45. Gas exchange and transport.
- ITEM 46. Regulation of ventilation.



13. ROLE OF EQUIPMENT AND SYSTEMS

MODULE F. RENAL UNIT PHYSIOLOGY. EXCRETION.

- ITEM 47. Introduction to the study of kidney function.
- ITEM 48. Renal excretory function and its mechanisms.
- ITEM 49. Physiology of the urinary tract.

14. ROLE OF EQUIPMENT AND SYSTEMS

MODULE G. HOMEOSTASIS OF THE CONCENTRATION OF PROTON AND BODY TEMPERATURE.

- ITEM 50. Regulation of acid-base balance.
- ITEM 51. Body temperature.

15. PRACTICAL ISSUES OF CONTENTS

The practical program is organized into 6 classes of three hours each. The topics have been chosen considering the most interest to students of Physiotherapy. The classes are:

- 1.- General Physiology: with a computer-simulated model, it is constructed a curve intensity/time and determine the following parameters: rheobase, chronaxie and absolute and relative refractory periods.
- 2.- Electromyography: electrical signals produced by muscles during contraction are captured.
- 3.-Nervous System (I): it is explored certain aspects of sensory function: Adapting to tactile stimulation, thermal sensitivity, pain and tenderness epicritic.
- 4.- Nervous System (II): exploring aspects of motor function, muscle strength and tone, tendon reflexes and skin, gait and balance.
- 5.- Cardiovascular system: blood pressure is determined by systolic and diastolic noninvasive methods and practices a cardiac auscultation.
6. - Respiratory: we explore the lung volumes and capacities with spirometry. It also is practiced auscultation.

In addition to these practical content, students will take 2 hours to be scheduled throughout the year (depending on the organization of the center) containing the resolution of problems and exposition of topics of the most interest or difficulty arise involve.

WORKLOAD

**PRESENCIAL ACTIVITIES**

| Activity | Hours |
|--------------------|--------------|
| Theory | 70,00 |
| Laboratory | 20,00 |
| Total hours | 90,00 |

NON PRESENCIAL ACTIVITIES

| Activity | Hours |
|---------------------------------------|---------------|
| Attendance at other activities | 0,00 |
| Individual or group project | 30,00 |
| Independent study and work | 40,00 |
| Preparation of lessons | 25,00 |
| Preparation for assessment activities | 40,00 |
| Resolution of case studies | 0,00 |
| Total hours | 135,00 |

TEACHING METHODOLOGY

The theoretical contents will be worked through lectures and seminars (and/or presentations of works).

In classes with practical contents will be used: a) computer simulations b) the learners themselves simulations and c) solving exercises and problems.

The teaching program may be modified during the development of the course if the teacher under teacher quality criteria and assimilation of knowledge by the student it deems appropriate.

EVALUATION

Multiple choice test that will include the theoretical-practical content of the subject: 90%. To calculate the result of this test, the following formula will be applied:

$$\text{GRADE} = [\text{correct answers} - (\text{errors} / \text{number of options} - 1)] * (\text{highest score} / \text{number of questions})$$

Conduct of seminars, attendance and use of practical and theoretical classes and seminars: 10% TOTAL: 100%

REFERENCES

- Susan M. Barman, Heddwen I, Brooks y Jason X.-J. Yuan Kim E. Barret. Ganong. Fisiología Médica. 26ª ed. Mc Graw Hill. 2019. Nueva York



- John E. Hall & John E. Hall. Guyton & Hall. Tratado de fisiología médica. 14ª ed. Elsevier. 2021. Barcelona
- Linda S. Costanzo. Fisiología. 6ª ed. Elsevier. 2018. Barcelona
- Dee Unglaub Silverthorn. Fisiología humana. 8ª ed. Panamericana. 2019. Madrid
- Stuart I. Fox. Fisiología Humana. 14ª ed. Mc Graw Hill. 2017. Nueva York