

26313 - Basic physiological principles for physical activity and sport

Información del Plan Docente

Academic Year	2018/19
Subject	26313 - Basic physiological principles for physical activity and sport
Faculty / School	229 - Facultad de Ciencias de la Salud y del Deporte
Degree	295 - Degree in Physical Activity and Sports Science
ECTS	12.0
Year	2
Semester	Annual
Subject Type	Basic Education

Module

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

The student must show that he has achieved the learning results that are expected through the evaluation activities

GLOBAL TEST EVALUATION MODALITY

First partial (January):

Contents: First half of the theoretical and practical topics of the official program. Two kind of evaluation activities will be made (written test and ability of practice), which have to be passed separately to eliminate subject matter.

Evaluation mode:

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1) Written test which contents two parts that will have to be passed separately (90%):

- Thirty test questions with five possible answers, in which the effect of chance will be subtracted (50%)

- Five short answers (50%)

Between the questions, there will be included theoretical and practical questions learned in the classroom and in the laboratory.

In order to pass the exam and eliminate the subject, the student must obtain at least 45% of the maximum score in each of the two parts of the test.

The students who obtain the 45% of the maximum score may compensate with the qualification of the second part (only if the average of the two partial exams is more than 50% of the maximum score).

2) Evaluation of the skill of the practice(10%)

The performance of the practical part will be evaluated by an evaluation rubric, which evaluates different parameters related to attitude, performance and other aspects of the practical activities in the laboratory. Students who do not attend more than 20% of laboratory activities, must take a practical exam.

Second part and final exam (June):

- *Evaluation of first part: the same structure as the first partial exam- Evaluation of the second part:*

Option 1: This option will be only available for those students that assist at least to 80% practical seasons of the second part of the subject and had responded at least 80% of the tracking test.

1.- Written exam (65%): test and graph interpretation.

2.- Evaluation of practices (20%): Assistance and delivery of the practice tracking sheet in a timely manner

3.- Follow-up of the subject (15%): at the end of each theme an evaluation test will be done in the classroom. The note in this section will be the arithmetic average of all the tests performed by the student.

Option 2: any student may be presented

1.- Written test (100%): it will be composed of questions type test and performance / interpretation of graphs. The official day of the examination calendar proposed by the center will take place.

To pass the subject, the arithmetic mean of the two parts must exceed 5 out of 10. You can compensate one part with another provided you get at least 4 points out of 10 possible in each of them. *Final exam (September):* In case of not passing the subject in June, the student will have to examine the whole subject in this call.

- *Evaluation of first part: the same structure as the first partial exam*

- *Evaluation second part:*

1.- Written exam (100%): It will be composed of questions type test and performance / interpretation of graphs.

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4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. The first part of the course focuses on understanding the main concepts of General Physiology. The second part helps the student to understand Exercise Physiology. A wide range of teaching and learning tasks are implemented, such as lectures, practice sessions, laboratory practice sessions, and tutorials.

4.2. Learning tasks

The course includes the following learning tasks:

- Lectures
- Practice sessions.
- Laboratory practice sessions and seminars.
- Tutorials.

4.3. Syllabus

The course will address the following topics:

SECTION I. General Physiology

Seminars

1. Carbohydrates
2. Proteins and lipids
3. Energetic metabolism
4. pH and its regulation

Lectures

1. General Physiology
 1. Physiology concept. Internal environment and homeostasis
 2. Cellular physiology fundamentals
 3. Micronutrients and water
 4. Transmembrane transport
2. Nerve and muscle
 1. Action potential
 2. Functional structure of muscle.
 3. Muscular contraction
 4. Neuromuscular junction. Excitation-contraction coupling
 5. Motor unit. Biophysics of contraction. Isotonic and isometric contraction. Regulation of force
3. Nervous system
 1. Functional organization of nervous system
 2. Sensitive functions of nervous system
 3. Reflex action
 4. Motor activity regulation
 5. Autonomous nervous system
4. Kidney and internal environment
 1. Biological fluids. Structure and general functions of kidney
 2. Glomerular filtration. Tubular reabsorption and secretion

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3. Hydroelectrolytic balance. Micturition
5. Immunity and blood
 1. General functions of blood. Components
 2. Red cells. Iron metabolism. Blood groups
 3. Platelets. Hemostasis
 4. White cells. Immunity
6. Cardiovascular system
 1. Circulatory system: characteristics and general functions
 2. Electric activity of the heart
 3. Mechanical activity of the heart. Cardiac cycle
 4. Regulation of Cardiac function
 5. Arterial physiology. Microcirculation
 6. Lymphatic and venous return
 7. Regulation of blood flux. Local circulations
7. Respiratory functions
 1. Function of respiratory airways. Respiratory muscles
 2. Thoracic pressures. Respiratory mechanics. Pleura and pleural fluid functions
 3. Respiratory cycle. Alveolar ventilation. Respiratory membrane. Oxygen consumption
 4. Blood gases transport. Regulation of respiration
8. Digestive functions
 1. Functions of mouth, esophagus and stomach
 2. Biliar and exocrine pancreatic secretions
 3. Intestinal physiology. Faeces.
9. Endocrine system
 - Endocrine system. Hormones. Hypothalamus pituitary axis. Endocrine pancreas. Suprarrenal glands

Practice sessions

1. Nervous exploration
2. Exploration of senses
3. Electromyography and dynamometry
4. Urine analysis. Sediment
5. Hematocrit
6. Blood groups
7. Blood pressure and pulses. Changes during exercise
8. Basal electrocardiogram
9. Basal spirometry
10. Glycemia.

SECTION II. Exercise physiology

Lectures

1. Introduction to exercise physiology. Historical perspective and key concepts.
2. Energy system and exercise.
3. Muscular responses and adaptations to physical exercise.
4. Cardiovascular responses and adaptations to physical exercise.
5. Pulmonar responses and adaptations to physical exercise.
6. Aerobic functional capacity.
7. Anaerobic functional capacity.
8. Neuroendocrinic responses and adaptations to physical exercise.
9. Renal gastrointestinal function and physical exercise.
10. Age and gender related to physical exercise: children, elderly and women.
11. Environmental stress and physical exercise. Thermal stress, hyperbaria and altitude.

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Practice sessions

1. Physical work assessment. Ergometers.
2. Work, power and energy.
3. Indirect calorimetry.
4. Electromiography and exercise.
5. Heart rate and blood pressure response to exercise. Heart rate monitors.
6. Anaerobic threshold determination by ventilatory and cardiologic methods.
7. Lactate threshold.
8. Oxygen consumption assessment.
9. Oxygen consumption estimation. Problems.
10. Physiological simulation. PhysiLogical.
11. Thermal regulation problems.
12. Video "El éxito de los keniatas".

4.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Faculty of Health and Sports Sciences website.

4.5.Bibliography and recommended resources