

Academic Year/course: 2021/22

26035 - Clinical exercise physiology for health professionals.

Syllabus Information

Academic Year: 2021/22

Subject: 26035 - Clinical exercise physiology for health professionals.

Faculty / School: 127 - Facultad de Ciencias de la Salud

Degree: 276 - Degree in Occupational Therapy

ECTS: 5.0

Year: 4 and 2

Semester: Second Four-month period

Subject Type: Optional

Module:

1. General information

1.1. Aims of the course

To have a basic understanding of the mechanisms through which physical activity affects metabolism and overall bodily functions, both in regular and altered conditions.

To acquire knowledge and skills towards the applicability of physical exercise and training when facing disease treatment.

1.2. Context and importance of this course in the degree

This is a multidisciplinary course in which the effects of physical exercise and the responses and adaptations of the organism when facing exercise and training are analyzed. Training methods for aerobic and resistance performance are studied, as well as the pathologies that might receive benefits from exercise when added to conventional medical care.

1.3. Recommendations to take this course

This course is closely related to basic subjects such as anatomy, physiology or public health. Previous knowledge in this area is advised. It is also recommended to have an active interest regarding physical activity, exercise, training and their relation with physiology.

2. Learning goals

2.3. Importance of learning goals

The aspects covered in this course include physical activity and health and will reflect and link with health promotion, research and social wellbeing.

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

This course is based on a combination of theoretical lectures directed to a broad audience, seminars and practical sessions conducted in reduced groups and individual work and study.

4.2. Learning tasks

1- Lectures for the whole group (1 ECTS)

Explanation and orientation for further personal study of different contents of the course, directed to the acquisition of specific skills related to the course and its learning results.

2- Practical sessions with reduced groups (1 ECTS)

Applied sessions focused on the acquisition of skills related to functional evaluation, use of medical apparatus and methods regarding physical training.

3- Seminars and individual paper (1 ECTS)

Develop abilities in the analysis, synthesis and planification of information gathering and reporting.

4- Non-attending activities (2 ECTS)

The student is responsible for their own study of practical and theoretical contents presented within the course, as well as the elaboration of an individual paper, retrieval of documentation and each other activities performed outside the classroom that are oriented to the acquisition of the specific skills.

5- Tutoring

In order to receive feedback regarding the learning process, the students may request personal tutoring within the stipulated timeframe set by the teachers (3 hours per week). Any questions arising from the study of the course may be discussed during these sessions.

Distribution of learning activities

Lectures	Seminars	Practical sessions	Individual paper	Tutoring	Individual study
25 h	12.5 h	12.5 h	25 h	3 h	50 h

4.3. Syllabus

Section 1. Basics of exercise physiology

1.1. Introduction to exercise physiology. Physiological responses and adaptations during exercise. Physiological adaptations to long-term exercise.

1.2. Neuromuscular adaptations to exercise. Muscle fibers and their recruitment during exercise. Muscular strength: concept and types of muscular actions. Muscular atrophy and strength decline related to inactivity. Overall aspects of strength training. Muscle pain and fatigue.

1.3. Exercise metabolism fundamentals. Aerobic and anaerobic energy obtention systems during rest and exercise. Physiological concepts related to energetic metabolism (maximum aerobic capacity, anaerobic threshold, oxygen deficit). Metabolic adaptations to training.

1.4. Cardiovascular function during exercise. Cardiac cycle. Vascular system. Blood-flow distribution. Arterial pressure. Blood volume and composition.

1.5. Respiratory function during exercise. Ventilation mechanics. Breathing regulation. Pulmonary ventilation during exercise. Problems linked to ventilation during exercise. Relationship between smoking habits and physical performance.

Section 2. Physical activity and health

2.1. Physical exercise as therapeutic method in medicine: introduction and justification.

2.2. Risks associated to physical exercise. Alarm signals. Cardiac problems. Injuries in sport. Strength, mobility and flexibility exercises with scarce effectivity.

2.3. Preliminary assessment of physical aptitude and health.

2.4. Evaluation of aerobic performance. Ergometric stress test. Maximum aerobic power in healthy and diseased populations. Functional classification of subjects according to aerobic exchange capacity (VO₂max). Signs and symptoms of exercise intolerance. Simple tests for aerobic evaluation.

2.5. Aerobic training prescription. Exercise modalities. Exercise intensity. Physiological adaptations to aerobic exercise.

2.6. Evaluation of muscular strength and training design. Basic terminology. Evaluation of isometric strength using dynamometers. Evaluation of dynamic muscular strength. Evaluation of dynamic muscular resistance.

2.7. Design of resistance training programs. Types of strength training. Dynamic and isometric strength training. Circuit training. Functional training. Effects derived from resistance training.

2.8. Body composition. Storage and essential body fat. Obesity. Underweight, exercise and menstrual irregularity. Methods for body composition assessment. Exercise prescription focused on modifying body composition.

Section 3. Exercise prescription in diverse pathologies

3.1. Circulatory system. Arterial hypertension. Heart failure. Ischemic cardiopathy.

3.2. Locomotive system. Artrrosis. Lumbalgia. Knee ligament injuries. Osteoporosis.

3.3. Endocrine system. Diabetes. Obesity. Dyslipidemia.

3.4. Neuropsychology. Anxiety. Depression. Multiple esclerosis.

3.5. Cancer. Other pathologies.

4.4. Course planning and calendar

The course will follow the general academic calendar.

- Lectures: 2h/week

- Practical sessions: 1h/week

- Group seminars: 1h/week

The individual paper is handed in the last month of the course.

Official exam calls: June and September

4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=26035>