

26001 - Kinesiology and human biomechanics

Syllabus Information

Academic year: 2023/24

Subject: 26001 - Kinesiology and human biomechanics

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

Degree: 276 - Degree in Occupational Therapy

ECTS: 8.0

Year: 1

Semester: Annual

Subject type: Basic Education

Module:

1. General information

The objective of the subject is that students acquire the knowledge and skills necessary to analyse the movement and posture of the human body, interpreting the forces that influence them. This is aligned with the UN' s Sustainable Development Goals, in particular Goal 3, 4 and 10 related to health, education and reducing inequalities. Kinesiology and biomechanics have developed in recent years and have been applied in different fields, such as occupational, ergonomic, medical and sports. These sciences can improve the quality of life of people and offer solutions in the evaluation of human motor capacity, technical aids to disabled people, orthotics and prostheses. Occupational therapy especially benefits from biomechanics and kinesiology to restore impaired functions and improve work performance and decrease fatigue.

2. Learning results

The student, in order to pass this subject, must demonstrate that:

1. Describes, relates and synthesizes the fundamental concepts of human kinesiology and biomechanics.
2. Adequately applies the biomechanical principles to the movements of the human body, in specific situations identifying the different types of anatomical levers.
3. Identifies and manages the techniques and instruments necessary to perform an adequate kinesiological exploration of the locomotor system and transcribes the results.
4. Is able to qualitatively and quantitatively assess the results of biomechanical analysis of the main activities of daily living, recognizing and interpreting signs of function and dysfunction.
5. Is capable of developing health promotion, dysfunction prevention and health education programs.

3. Syllabus

TOPIC 1. INTRODUCTION TO KINESIOLOGY.

TOPIC 2. INTRODUCTION TO BIOMECHANICS.

TOPIC 3. FORCES.

TOPIC 4. MOVEMENT.

TOPIC 5. WORK, POWER AND ENERGY.

TOPIC 6. LEVERS AND PULLEYS.

TOPIC 7. BALANCE AND STABILITY.

TOPIC 8. BONE TISSUE.

UNIT 9. JOINTS.

UNIT 10. SKELETAL MUSCLES. MUSCULAR BIOMECHANICS. MUSCLE BALANCE.

UNIT 11. NEUROMUSCULAR BASIS OF HUMAN MOVEMENT.

UNIT 12. KINETIC CHAINS.

UNIT 13. SHOULDER.

UNIT 14. ELBOW.

UNIT 15. WRIST

UNIT 16. HAND.

UNIT 17. HIP.

UNIT 18. KNEE.

UNIT 19. ANKLE AND TIBIOPERONEAL JOINTS.

- UNIT 20. FOOT
- UNIT 21. SPINE AS A WHOLE.
- UNIT 22. CERVICAL SPINE.
- UNIT 23. DORSAL SPINE AND THORAX.
- UNIT 24. LUMBAR SPINE.
- UNIT 25. THE PELVIC GIRDLE.
- UNIT 26. ANALYSIS OF MOTOR SKILLS.
- UNIT 27. KINESIOLOGY OF ERECT POSTURE.
- UNIT 28. POSTURAL CONTROL IN THE ACTIVITY.
- UNIT 29. NORMAL HUMAN GAIT.
- UNIT 30. KINESIOLOGY IN EXERCISE PROGRAMS.

4. Academic activities

The program of the subject consists of:

- **Theoretical classes** (50 hours) consisting of presentations by the teacher in the classroom.
- **Seminars** (10 hours) of theoretical and practical content. Attendance is mandatory.
- **Practices** (20 hours) for the application of kinesiological analysis techniques. Attendance is mandatory.
- **Group work with public presentation, individual work and activities** scheduled throughout the term related to the content of the subject. (36 hours)
- **Personal study and evaluation** (84 hours). Students must take responsibility for self-study throughout the entire term as a means to achieve the expected learning results and the progressive acquisition of competencies.

5. Assessment system

Evaluation of theoretical content (weighting: 60% of the final grade)

The material given in the theoretical classes, in the seminars, in the practices, in the group work and in the activities proposed throughout the term will be evaluated in the theoretical exams.

Midterm theory exam

A midterm exam will be held at the end of the first four-month period and will consist of two parts: **a test and a development part**.

1. The multiple-choice part will consist of 20 multiple-choice questions with only one valid answer. To avoid random right answers, these will negatively affect the grade, according to the formula: number of hits, minus the quotient resulting from dividing the number of errors by the number of alternatives minus one.
2. The developmental part will consist of a developmental question related to the content of the theoretical and practical classes.

The grade of the midterm will be obtained by the average of both parts, being necessary to obtain a minimum of 4 points out of 10 in each one of the parts in order to obtain the average.

Theoretical final exam (first official call for exams at the end of the term)

Theoretical final exam of the whole subject in the official May-June call for all students who have not taken the midterm exam or have obtained a grade lower than 5 points.

Students who pass the midterm exam, at the official call at the end of the term may only sit for the exam corresponding to the part of the subject taught in the second four-month period.

The exam format and grading of the final exam will be the same as in the midterm exam.

The overall grade of the theoretical content for students who achieve more than 5 points in each midterm will be the average of both midterms.

The overall grade of the theoretical content of the students who obtain less than 5 points in the midterm exam and take the final exam with all the topics will be the grade obtained in the final exam.

It will be necessary to obtain at least 5 points out of 10 to pass the theoretical part

Evaluation of practices and seminars (weighting: 30% of the final grade)

Students who attend at least 80% of the practical classes and seminars, will be evaluated through:

Individual work: Preparation of a practice notebook in which the content of each practice will be recorded. The student's ability to describe the content of the practice, clarity, order, expression and ability to organize and synthesize the information will be assessed. The passing grade for the practical notebook will be at least 5 points out of 10.

Attitude: Each student will obtain a grade for each practical based on the following criteria:

- The attitude and the fulfilment of the objectives proposed in point 1.1.
- Specifically, the following will be taken into account:
 - Punctuality, preparation of the students for the practice and active participation.
- In order to pass this part, the average of the grades of each practice must be at least 5 points out of 10.

Students whose absences exceed 20% of the practical classes without justification, will be evaluated by means of a test in

which they will have to demonstrate their mastery of the subject through the resolution of different practical assumptions related to the content of the practices.

The minimum passing grade for the practical part will be 5 points.

Group work, individual work and activities (weighting: 10% of the final grade)

The quality of the bibliography used, the capacity of synthesis, the organization, the clarity of the presentation and the correct use of the time established for the presentation will be positively assessed.

Group work: It will be evaluated by a co-evaluation system where each student will evaluate by filling in a rubric for each of the works presented.

Individual work and activities: Objective evaluation criteria will be established based on the theoretical content.

The student's capacity for bibliographic search in bibliographic sources will be assessed, as well as the relevance and accuracy of the answers.

The grade for this part will be the average of the grades obtained in the different assignments and activities, being necessary at least a 5 out of 10 to pass it.

Grades

To pass the subject it will be necessary to pass each of the parts.

Grading will be done on a numerical scale from 0 to 10, with one decimal place: 0- 4.9 Fail; 5-6.9 Pass; 7.0-8.9 Notable; 9.0-10 Outstanding