COURSE DATA

DATA SUBJECT

Code: 33217
Name: Biomechanics of physical activity
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1312 - Degree in Physical Activity and Sport Sciences	Facultat de Ciències de l'Activitat Física i Esports	3	First quarter, Second quarter
1331 - Degree in Physical Activity and Sport Sciences (Ont)	Facultat de Ciències de l'Activitat Física i Esports	3	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1312 - Degree in Physical Activity and Sport Sciences	Biomechanics of physical activity	COMPULSORY
1331 - Degree in Physical Activity and Sport Sciences (Ont)	Biomecánica de la Actividad Física	COMPULSORY

COORDINATION

PEREZ SORIANO PEDRO

SUMMARY

Biomechanics of physical activity is a matter of basic and mandatory training, which consists of 6 ECTS credits spread over a semester. Biomechanics of Physical Activity (and / or Sports Biomechanics), could be defined as an eminently interdisciplinary branch of applied biomechanics, with foundation or starting point in the Science of Physical Activity and Sport, whose object of study through different tools and instrumental techniques, focuses on humans for physical practice / sports (especially the kinetics and kinematics of movement), and the result of their interaction with others, fluids, surface and /or inanimate objects .

Through theoretical matter, be submitted to the biomechanics, its method, its application areas and their different perspectives, will explore the mechanical basis governing the movement, describing the instrumental techniques employed, different movements will be analyzed human as well as the main biomechanical design criteria and selection of material and sports equipment. To complement this theoretical content, practical content developed through workshops and seminars will enable students / as familiar with the method of Biomechanics, taking direct contact measurement instrumentation, and propose solutions to various problems proposed.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

COMPETENCES / LEARNING OUTCOMES

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Apply biomechanical principles to the different fields of physical activity.

Apply information and communication technologies (ICTs) in the field of physical activity and sport sciences.

Apply the principles of fundamental rights, gender equality, equal opportunities, universal accessibility for people with disabilities, solidarity, environmental protection, the culture of peace and democratic values.

Design, implement and evaluate the teaching-learning processes related to physical activity and sport, paying attention to the individual, collective and contextual characteristics of people.

Develop habits of professional excellence and quality.

Gain basic scientific training applied to physical activity and sport in their mechanical forms.

Identify mechanical risks derived from inappropriate physical and sporting activities and propose alternatives.

Know and understand the biomechanical factors that determine the practice of physical activity.

Know and understand the effects of the practice of physical exercise on the structure and mechanical function of the human body.

Plan, implement and evaluate physical activity and sports programmes targeted at special populations.

Promote and evaluate the acquisition of enduring and autonomous habits of practising physical activity and sport.

Select and know how to use sports material and equipment, suitable for each type of activity and population.

Select and know how to use sports material and equipment in the most appropriate way for different types of activities and populations under biomechanical criteria.

DESCRIPTION OF CONTENTS

1. INTRODUCTION TO BIOMECHANICS

Unit One (Issues 1-3), establish the conceptual and historical framework of Biomechanics and analysis methodology used.

2. MECHANIC BASES: ANALYSIS OF PHYSICAL ACTIVITIES & SPORTS

Second unit (items 4-9) presents the basic content for the mechanical analysis (dynamic and kinematic) motion or rest of the body, as well as interaction with fluids and materials for the practice of physical activity and sport.

3. BIOMECHANICAL TECHNIQUES TO INSTRUMENTATION

Unit III (Items 10): Instrumental techniques not discussed in the workshops will be described.

4. BIOMECHANICAL ANALYSIS OF PHYSICAL ACTIVITIES & SPORTS

Fourth unit, is presented from the perspective of biomechanical analysis, kinematic and kinetic characteristics of human gestures often related to physical activity, and a small representation of biomechanical analysis in different sports and physical activities.

5. BIOMECHANICAL OF SPORTS EQUIPMENT

Finally, the Fifth Unit , aims to introduce in the biomechanical study of materials and sports equipment, from the perspective of health and performance, specifically in footwear and sports surface (present in any physical activity / sports).

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	45,00
Laboratory	15,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours

Attendance at other activities	2,00
Individual or group project	18,00
Independent study and work	34,00
Preparation of lessons	18,00
Preparation for assessment activities	10,00
Resolution of case studies	8,00
Total hours	**90,00**

TEACHING METHODOLOGY

As shown in the previous section, the development of the subject is structured around 4 face axes: Theoretical lessons, workshops, seminars and tutorials, as well as two non-contact areas: Study and autonomous and / or team work.

The theoretical lessons will be taught in the classroom, where the scientific and technical matter, bases highlighting the key to understanding the subject concepts are explained.

The practical lessons (workshops) are normally taught in the Laboratory of Biomechanics. Will last approximately 2 hours and the student may check (individually or collectively), procedures practical application, allowing familiar with tools used in sports biomechanics, develop their ability to analyze biomechanical variables and confront the actual resolution problems, and to strengthen and reaffirm the validity of the content covered in lectures.

Seminars: may be developed in the classroom, with the same resources of the lectures. Each seminar will consist of a small number of works, which will be presented by the students themselves. These monographs, allow introduce students in intellectual collaboration, preparing for team research, especially focused on the search and selection of information.

Tutorships: they will be held in the offices of professors and virtually by email (official user UV). They guide the student's interest in learning more about a particular subject matter, and especially to answer questions related to the subject itself.

EVALUATION

The minimum requirements to pass the subject through the c***ontinuous evaluation mode*** are related to passing the theoretical and practical part, based on:

In relation to the theoretic section:
There will be a theoretical exam on the day of the official call.

Previous (partial) controls may be carried out, which eliminate material from the final exam.

Both the final and partial exams will be passed with 5 points (out of 10).

Within this part of theoretical contents, presentations, written works and/or presentation seminars by the students may be included.

In relation to the practical section:

Attendance, participation, as well as the presentation of the requested workshops ("*Portafolios*") will have a maximum score of 3 points.

The final grade for the course will be obtained as follows:
Final grade = (70%) Theoretical grade + (30%) Practical grade

The minimum requirements to pass the subject through the ***Final Evaluation mode*** are related to passing the theoretical and practical part, which is based on passing a theoretical exam that includes contents of the theoretical part (the result represents 50 % of the final grade) and contents of the practical part (the result represents 50% of the final grade). That is, the grade for the subject by selecting the Final Evaluation mode will be obtained as follows: Final Grade = (50%) Theoretical Grade + (50%) Practical Grade (being necessary to obtain equal to or greater than 25% in both parts (theoretical and practical) to be able to average and pass the subject).

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