



Guía Docente
“Parte General”

Biochemistry of Physical Activity and Sport
Sciences of Physical Activity and Sport Grade (2nd course)

1. SUBJECT DESCRIPTION

Grade:	Science of Physical Activity and Sport
Double Grade:	
Subject:	Biochemistry of Physical Activity and Sport
Module:	I, Scientific Basis of Human Movement
Department:	Fisiología, Anatomía y Biología Celular
Semester:	Second semester
Total Credits:	6
Course:	2
Character:	Compulsory
Teaching & Learning language:	English

Teaching Model:	C1	
a. Basic Teaching (EB):		50%
b. Practice and Development Teaching (EPD):		50%
c. Guided Activities (AD):		NO

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2. HEAD OF THE SUBJECT

Head of the subject	
Name:	Manuel Angel Ballesteros Simarro
Center:	Faculty of Sport
Department:	Fisiología, Anatomía y Biología Celular
Area:	Biología Celular (Cell Biology)
Category:	Associate Professor
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3. CONTEXT IN THE TRAINING PLAN

3.1. Description of the objectives

Our main objective with this course is to provide students with an overview of Energy Metabolism and the integration of metabolic activities in the human body in motion, as well as modulation under new energy demands ascribed to Physical Activity.

3.2. Contributions to the training plan

The subject will primarily focus on bioenergy and Biological bases of sport that has already been introduced in previous subjects such as "Human Physiology" and "Motor System Functional Anatomy". We will underlined the metabolic and energetic factors that influence Sport and Physical Activity practice, focusing on the effects that physical exercise has on the structure and function of the human body. We are also introducing several aspects that shall subsequently applied in other subjects, such as “Physiology of sports training”, “Nutrition of the sportsman” and “Sport training related to physical health”

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3.3. Recommendations or previous knowledge required

- English language: correct expression both oral and written, competent understanding and reading.
- Basic knowledge of biology.
- Having passed the subjects "Motor System Functional Anatomy" and "Human Physiology" User-level knowledge of virtual teaching platform WebCT

4. COMPETENCES

4.1 Degree competences that will be developed in the subject

- a) Instrumental: From the beginning we will heighten both analysis and synthesis skills. Our subject has mainly an applied approach, we do not want our students to memorize concepts and formulas, but to understand and integrate the acquired knowledge. We will also exercise the ability to organize and plan during the laboratory practices. We will also work with basic computing tools and solve problems related to sport training from a scientific point of view.
- b) Systemic: Practical and Development teaching classes and tutorials have among its objectives to promote independent learning under the teacher guidance, also to promote creativity and active involvement in all the academic activities. We will assert on boosting your initiative to resolve the challenges, complete assignments and empower your curiosity and encouragement for the application of scientific and technical knowledge.
- c) Personal: During the course we will promote teamwork through group assignments both in the classroom and outside.

4.2. Module Competences that will be developed in the subject

- a) To acquire the scientific foundations related to the branch of knowledge of the Health Sciences, relevant to the Sport and Physical Activity.
- b) To become more familiar, understand and be able to apply physiological and mechanical factors that influence the practice of Physical Activity and Sport.
- c) To identify the effects that physical exercise has on the structure and function of the human body.

4.3. Specific competences that will be developed in the subject

- a) To acquire basic scientific training in the field of biochemistry that the future sport professional could put to use into physical activity and sport training.
- b) To know and understand the biological, bioenergetics and metabolic aspects related to sport practice and physical activity as well as the diverse indicators of human movement.
- c) To know and understand the effects of physical exercise on bioenergetics and metabolism of human body



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5. CONTENTS OF THE SUBJECT (CURRICULUM)

The Curriculum consists of 3 Thematic Units to be developed in the sessions of Basic Teachings:

UNIT I: FUNDAMENTALS

In this thematic unit we will address basic aspects of biochemistry as an introduction to Sport and Physical Activity applied Biochemistry.

UNIT II: ENERGY METABOLISM

In this thematic unit we will address energy metabolism applied to human physical activity.

UNIT III: METABOLIC INTEGRATION.

In this thematic unit we will integrate the different subjects we have learned during the course in order to apply them to Sport and Physical Activity real scenarios.

6. METHODOLOGY AND RESOURCES

6.1 Student Workload

TOTAL NUMBER OF STUDENT WORKLOAD: 150 hours.

In-class hours: 53

- Basic Teachings (Attendance at lectures): 22.5
- Practices and development Teachings (Assistance to Practice): 22.5
- Specialized tutorials (face to face and/or online): 8
- Final Exam 2

Individual (autonomous) learning: 97

- Hours of study and preparation for basic teachings: 45
- Hours of study and preparation of practice and of development teachings, including team-work task: 45
- Performing assessment tests and / or exams: 7

6.2. Teaching Techniques

6.2.1. Theoretical Lessons (EB)

Lectures will be taught in weekly sessions of an hour and a half, according to the schedule given by the Faculty of Sport.

In general, teachers will summarize the main aspects of each theory topics and focus on those aspects that are either most important or difficult to students, showing the proper way to work and learn from each of the topics. Our script of the lectures is as follows:

- Overview of the subject matter and importance within the overall framework of the subject.
- Development of the main points and questions.
- Debate.

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6.2.2. Practices and development sessions (EPD)

EPD activities are directly related to Basic Teaching Curriculum and will focus to explore both practical and applied aspects.

The Training and Development sessions of this course will last for one and a half hour every week at the assigned time by the Faculty of Sport.

The practical classes will focus on practical cases, problem support classes and presentations by students of assigned topics.

Teachings and Practices Development are divided into four Units of three classroom sessions each:

- **A: Approach** of the activity to develop during this unit. This session will take place in the classroom and will provide with the theoretical foundations necessary for the proper development of the practical part. This session will also serve to answer any questions that students raised in relation to this unit.
- **D: Development** of the practice. This session will take place in the laboratory and will take a series of experimental determinations from which several results will be obtained.
- **E: Evaluation** of this unit. This session will take place in the classroom and in it each team must prepare a report analyzing the results obtained previously. After this session, and with this report, each team will provide the teacher with the resolution of any other issues or activity related to this unit that, where appropriate, be raised during this session.

For the correct progress of this part of the course team work during EPD sessions is crucial. To do this, and in order to positively reinforce this attitude, student teams that demonstrate a collaborative participation of all of its members receive extra credit in their respective grades (as discussed below in the section on "Evaluation").

It is also important not to lose the connection between the different classroom sessions that make up each unit, i.e. when you go to a classroom session must take into account what have been seen in the previous sessions.

Students will have more information on these activities in the “Specific Teaching Guide”, which will be provided in the virtual classroom from the month of January 2016.

6.2.3. Mentoring Sessions

Each faculty member will establish office and tutoring times during the presentation in the first class. Students will also have the opportunity to participate in online mentoring through participation in the forums of the virtual platform. Students can also request a personal appointment to the Professor if they deem it necessary.

6.2.4. Online Teaching

Online Teaching organized in our virtual campus (WebCT-platform) is a key support for our subject. Teachers shall use this online platform for regular communication with students.

On this online platform, students can find:

- Teaching support of theory topics with summaries, presentations and self-assessment exercises.
- Information regarding practices: Registration, schedules, scripts, rules, calendars and tutorials.

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- Virtual tutorials and Forums.
- Email service
- Educational Links.
- Agenda and course’s curriculum.
- Teaching Guide
- Detailed learning resources, both bibliographic and virtual.

7. EVALUATION

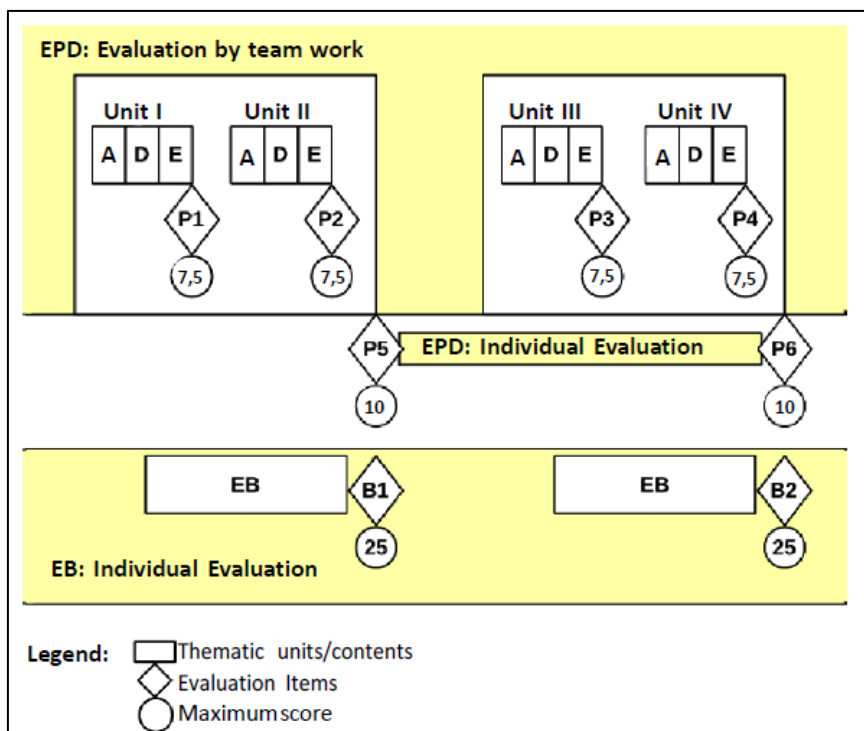
The evaluation criteria are in accordance with the provisions of the current regulations for the Evaluation of undergraduate students- Universidad Pablo de Olavide (06/03/2014, BUPO No. 7/2014).

To make clear the different aspects of the evaluation we will establish a 100-point based-scale, so that the final qualitative rating would be:

- “Suspendo”: When the final score is below 50 points
- “Aprobado”: Between 50-70 points
- “Notable”: Between 70-90 points
- “Sobresaliente”: Between 90-100 points.

Obtaining Distinction (“Matrícula de Honor”) may be assigned to students with a higher score to 90 points and is established in the regulations for the evaluation of undergraduates at the University Pablo de Olavide.

The following chart summarizes the model of continuous assessment will continue on the course and we will explain below:



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1. Continuous evaluation for the First Call

- The overall grade for the course will be split as follows: 50 points for EB and 50 points for EPD.
- The final score is the sum of all points earned in each of the computable elements.
- In order to pass the subject the student must obtain a minimum of 50 points out of the 100.

A. Basic Teaching (EB, 50 points from the total)

There will be 2 written exams to be performed individually on the theoretical contents. Each of these will have a maximum score of 25 points. The first of these exams (EB1) will take place approximately mid-year, the second (EB2) will coincide with the official first call examination (end of May-beginning of June).

B. Practical and Development Teaching (EPD, 50 points from the total)

- As discussed above, the third classroom session of each EPD Unit consist of an evaluation of the said Unit. During this session, we will assess each team and each of these evaluations (P1-P4) will have a maximum score of 7.5 points.
- There will be two written individual evaluations (P5 and P6) on the EPD contents.
- Each of these evaluations will have a maximum score of 10 points. The first of these evaluations (P5) will take place approximately mid-year, along with the EB1 Exam, and will focus on the contents of the first two EPD Units. The second evaluation (P6) will be held along with the EB2 Exam evaluation and will focus on the contents of the last two EPD Units.

SUMMARY:

Teamwork EPD assessments (P1-P4):	4 tests x 7.5 points each / max. = 30 points
Individual EPD assessments (P5-P6):	2 tests x 10 points each / max. = 20 points
individual EB assessments (EB1-EB2):	2 tests x 25 points each / max. = 50 points

Total Maximum score = 100 points

Important:

- No evaluable item affects the assessment of others.
- There are no minimum grades to pass a specific test/exam. The final grade obtained is the summation of every individual assessment. Therefore, if someone does not make a test/exam will not score points for that particular item. Similarly, since there are no minimum grades, each of the evaluable item is not recoverable.

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2. Non-continuous evaluation (assessment by Final Exam)

In addition to the continuous evaluation, students may opt for a non-continuous evaluation in which:

- There is the option of getting the maximum 100 points score.
- The grade will be obtained from a single test called "Final Exam" encompassing all contents of the course (50 points EP + 50 points EPD).
- No incentives shall apply.
- Since this Final Exam will take place on the official date for the first call, and will coincide with the ongoing EB2 and P6 test, the students who choose this model of assessment must inform the teacher responsible for the subject with at least two weeks before the date of the exam, in order to facilitate the organization of the evaluation process.

3. Evaluation in Second Call (resitting)

Students who do not pass the course in the first call have the option of a second call, also called "resitting" or "recovery". In this call the student may:

- A.** Renounce to previous grades from continuous evaluation
 - In this case, the student will be examined by a single exam of all contents of the subject. Thereby, it will apply the same criteria as for the not continuous evaluation by Final Exam (see above).
 - This will also apply for the students who have not followed the model of continuous assessment and fail the first call Final Exam.
- B.** Keeping part of the grades obtained during continuous evaluation
 - Students may keep either the EB or the EPD grade and examine for the remaining part: All EB contents or all EPD contents. In fact, this corresponds to $\frac{1}{2}$ of the recovery Final Exam.
 - Thereby, Resitting exam will account for a maximum score of 50 points.
 - Under this assumption, the final grade is the sum of the grade obtained in the recovery exam plus the part the student has decided to retain.

Important considerations to take into account in the evaluation

- A. On the written exam:** All exams taking place during the course will consist of a series of short questions reflecting clearly and concisely the acquired knowledge during the course by solving a metabolic problem or a specific biochemical situation applied for Sport and Physical Activity, in which the student must justify their answers. These questions will be based on the tasks and questionnaires performed throughout the course. In the exam, the scores for each of its constituent parts shall be marked, as well as the minimum qualification required to pass the test.
- B.** Students who fail the subject after both official calls must repeat the whole subject in the next or subsequent academic courses, not retaining any of the grades obtained during the present course.



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It is recalled that the UPO allows an extraordinary call in the month of November for students who are enrolled in all detract ECTS credits to complete their studies. This call must be requested within the time and in accordance with the procedure established by the Faculty of Sports Science. In this call the student will be evaluated for the total subject curriculum in accordance to the competences contained in the teaching guide from the previous year, in which the student will be able to obtain 100% of the full grade.

8. GENERAL BIBLIOGRAPHY

In principle, there is no a fully comprehensive text covering all the topics to be covered in this course. The following are the current and recommended books, all available in the Library.

General Bibliography:

- Alberts, B. et al. Essential cell biology: an introduction to the molecular biology of the cell. New York [etc.] : Garland Publishing, cop. 1998.
- Berg, Jeremy “Biochemistry”. New York : W. H. Freeman and Company, cop. 2002 M., Lubert. Bioquímica. Reverté, D.L. 1998.
- Elliott, William H. “Biochemistry and molecular biology”. Oxford [etc.] : Oxford University Press, 2002.

Specific Bibliography:

- Hargreaves, Mark. Exercise metabolism. Champaign, IL : Human Kinetics, cop. 2006.
- Maughan, Ron. Biochemistry of exercise and training. Oxford : Oxford University Press, 2008
- Mougios, Vassilis. Exercise biochemistry Champaign, IL : Human Kinetics, cop. 2006.
- Wilmore, Jack H. “Physiology of sport and exercise” Champaign (Illinois) : Human Kinetics, 2004

Journals available at the Library:

- International Journal of Sports Medicine
- Journal of Science and Medicine in Sport