TEACHING GUIDE

1. SUBJECT DESCRIPTION

Degree:	**Human Nutrition and Dietetics**
Subject:	**Cell Biology**
Module:	
Department:	**Physiology, Anatomy and Cell Biology**
Year:	**2016-17**
Semester:	**First**
ECTS credits:	**6**
Course:	**1**
Type:	**Basic**
Language:	**English**

Model	**C1**
a. Basic teaching (EB):	**50%**
b. Practical teaching (EPD):	**50%**
c. Guided Academic Activities (AD):	**---**

TEACHING GUIDE

2. PROFESSORS

Name:	**José A Sánchez Alcázar**
Center:	**Faculty of Experimental Sciences**
Department:	**Physiology, Anatomy and Cell Biology**
Area:	**Cell Biology**
Category:	**Senior lecturer**
Tutorial hours:	**Monday and Wednesday 9:00 a 12:00 h** **ALWAYS SET APPOINTMENTS PREVIOUSLY**
Office number:	**E22.1.14**
E-mail:	**jasanalc@upo.es**
Phone:	**954 978071**

Name:	**Marina Villanueva Paz**
Center:	**Faculty of Experimental Sciences**
Department:	**Physiology, Anatomy and Cell Biology**
Area:	**Cell Biology**
Category:	**Fellow (FPU)**
Tutorial hours:	**Monday and Wednesday 9:00 a 12:00 h** **ALWAYS SET APPOINTMENTS PREVIOUSLY**
Office number:	**E22.1.14**
E-mail:	**marvp75@gmail.com**
Phone:	**954 978019**

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TEACHING GUIDE

TEACHING GUIDE

3. TRAINING PLAN

3.1. Goals

• To understand the structural and molecular aspects of cell-based organisms.
• To have an overview of the cell and the integration of its functions within the body.
• To achieve a vision of the versatility of the living system against changes.
• To select the relevant information in the technical and scientific literature.
• To develop skills for presenting technical scientific information in public.
• To develop skills for writing documents with clear and technically rigorous language.
• To develop skills for solving biological problems in relation to human nutrition.

3.2. Contributions to training plan

The subject "Cell Biology" provides the students the essential foundations for understanding the structures and functions of the cells in the human body, as well as the cellular aspects of human nutrition and metabolism.

3.3. Recommendations or previous requirements

There are no prerequisites. Previous user-level computer knowledge (office package and Internet browsing) is recommended.

TEACHING GUIDE

4. COMPETENCES

4.1 Degree competences developed in the course

• Capacity for analysis and synthesis.
• To develop skills for management of information and expression of knowledge.
• To explain and argue, orally and in writing, the results of a work/task.
• To develop skills for planning and time management.

4.2. Module competences developed in the course

• The biology and function of cells as an integral unit in tissues.
• Fundamentals of inorganic and organic chemistry.

4.3. Subject-specific competences to be developed

a) Professional competencies/skills.
- To develop pedagogical methods for teaching.
- To handle the basic tools in computer and computational techniques of information and communication.

b) Attitudinal skills.
- To develop abilities of criticism and self-criticism.
- To show respect and appreciation for the work of others.

5. CONTENTS (topics)

THEOTERICAL CONTENTS. (EB)

1. Concept and definition of cell. Cell theory. General characteristics of the eukaryotic cell: general structure.
2. The plasma membrane as selective semipermeable barrier. Osmosis. Accumulation of energy in ionic gradients: electrolyte balances.
3. Cell compartmentalization: main organelles and their functions.
4. Intracellular transport of protein and lipid materials.
5. Cellular bioenergetics. Uses of mitochondrial energy: ATP generation, heat and reactive oxygen species.
6. Cytoskeleton and cell movement.
7. Cell proliferation and tissue renewal.
8. Constitution of tissues and organs. Intercellular communication.
9. Epithelial tissues.

PRACTICAL TEACHING TOPICS. (EPD)

1. Developing specific topics based on the subject: organization instructions, treatment and information management.
2. Optical microscopy: basics and use of the optical microscope. Observation of cells and tissues.
3. Importance of the electrolytic composition of plasma. Alteration of ionic gradients of the cell membrane and its effects on cellular physiology. (Lab coat required)
4. Staining. Sample preparation: fixation, embedding and sectioning with microtome. Hematoxylin-eosin staining and assembly. Observation of the preparations. (Lab coat required)
5. Electron microscopy. Treatment and sample preparation. Types of electron microscopes. ultra-structural study of the various cellular components.
6. Cellular elements of blood. Collection of blood samples, Giemsa staining and observation of blood smears. Blood groups. (Lab coat required)

7. to 10. Development of specific aspects of practical issues related to Cell Biology. Examples of topics that can be developed are:
• Importance of diet in membrane fluidity
• Metabolic Diseases
• Nutrition and Cancer
• Food Frauds
• Morbid obesity
• Intolerances and food allergies, ...
Students should prepare, in pairs, one of these topics and present their work to the rest of the students during a period of approximately 30 min. A brief discussion on the topic presented will be carried out after the presentation.

The work of the students will be scored according to the following criteria:

	Insuficient	Correct	Remarkable	Outstanding	Mark
Development of the main ideas	(1 point)	(2 points)	(3 points)	(4 points)	
Orthography	(0,25 points)	(0,5 points)	(0,75 points)	(1 point)	
Expression and vocabulary	(0,25 points) y expresión deficiente.	(0,5 points)	(0,75 points)	(1 point)	
Timing	(0,5 points)	(1 point)	(1,5 points)	(2 points)	
Slides	(0,5 points)	(1 point)	(1,5 points)	(2 points)	
Presentation without reading	(0,5 points)	(1 point) Se expone el tema recurriendo a las notas más de lo deseado.	(1,5 points) s.	(2 points)	
Treatment of contents	(0,5 points)	(1 point)	(1,5 points)	(2 points)	
Questions and debate	(0,5 points)	(1 point)	(1,5 points)	(2 points)	
General impression	(1 point) Bad	(2 points) Correct	(3 points) Good	(4 points) Very good	

STUDENT:	.....	**DATE:**	
		TOTAL:	**0,00**
Issue:	.....	**GROUP:**	

Maximum score: 20 points
(see below in Evaluation section)

6. METHDOLOGY AND RESOURCES

a) Basic teaching (EB):

• The classroom sessions are voluntary. Classroom sessions are devoted to data and information sharing of the main issues included in the TEACHING GUIDE.
• The aim of the classroom sessions is the clarification of the issues that are more complex for their understanding.
• The dynamics of these sessions include frequent interaction with the students who are encouraged to participate by asking questions and giving responses to questions posed in class.
• Some of these issues and others not covered in the classroom sessions will be worked by questionnaires through the Virtual Platform.

b) Practical teaching (EPD):

• The laboratory classroom sessions are voluntary. However, considering that this degree is experimental in nature, it is recommended to attend to this type of training.
• There will be also a non-experimental practical task as a non-presential work. This work will focus on issues directly related to nutrition and presented in public in couples over the last four sessions. Since one the aim of this activity is to encourage the habit of communication and public presentation of a topic, it is crucial the attendance of all the students. For this reason, attendance at these four sessions is mandatory. In fact, attendance will be taken into account for the qualification of this part of the subject.

c) non-presential activities and tutorials

• All non-presential activities are delivered, evaluated, scored through the Virtual Classroom tool. Announcements about subject, scores, schedule of activities, etc. are published herein.
• Tutoring sessions can be held by face-to-face or virtual meetings and always set by a previous appointment to optimize the use of time.

d) Agenda

- Proper management of both presential and non-presential activities is essential. Therefore the following structure of the course is proposed:

  d1) The temporary organization for the 23 presential sessions (EB) (1 hour per presential session) is as follows:

Session	Hours
Introduction	**1**
Topic 1	**2**
Topic 2	**3**
Topic 3	**3**
Topic 4	**3**
Topic 5	**2**
Topic 6	**3**
Topic 7	**3**
Topic 8	**2**
Topic 9	**1**
Total	**23 hours**

d2) The agenda for the 10 practical teaching sessions (EPD) is:

- a session for giving the instructions for the preparation and presentation of the student work (1,5 hours)
- five sessions of laboratory practices (2,5 hours each)
- four sessions (2 hours each) for student work presentations
- **Total: 22 hours**

d3) The temporary organization proposal from the non-presential activities is as follows:

• 1 hour for the overall organization of the course work agenda

• 54 hours for EB issues. About every issue requires 6 hours of non-presential work with the following distribution:

 2 hours for documentation in the library and information search

 3 hours to prepare the report of each issue incorporating the information obtained

 1 hour to review and study of the topic

• 20 hours for the non-experimental work to present in public (suggested 15 hours of searching of information and documentation and 5 hours for the writing and presentation)

• 15 hours of study for the preparation of final exams

• Total non-presential work: 90 hours

d4) The agenda for evaluations is as follows:

• 7.5 hours to answer the questionnaires of EB issues (50 min by questionnaire)
• 2.5 hours to solve practical evaluable questionnaires (30 min by questionnaire)
• 0.5 hours for presenting the non-experimental work
• 2 hours to answer a questionnaire about the students work presentations
• 2.5 hours for a written exam at the end of the semester
• Total hours 15 hours of evaluation

In summary:
• EB, 23 Hours
• EPD, 22 Hours
• Non-presential work, 90 Hours
• Hours evaluation, 15
Total course 150 hours (6 ECTS)

f) Recommendations to pass the course successfully.

• Before each presential session review key aspects of the topic, resources available in the Virtual Classroom and search of documents and information.
• During the sessions raise any doubts, maximizing the presential hours available with teachers.
• After practice sessions prepare the report of the issue and review it with a brief final study.
• Bring the subject up to date following the recommendations of the temporary organization.
• During the academic year you can consult with teachers by tutorial sessions or through the Virtual Platform.
• To understand the biological processes included in the TEACHING GUIDE; avoid unnecessary memorization about aspects that are not well understood.

TEACHING GUIDE

7. EVALUATION

- A continuous and formative evaluation method, intending to be progressive, motivating and participative will be applied during the whole course
- The overall mark of the course derives from the weighted averaged mark of the aforementioned activities. Each of these activities will be assessed according to the following percentages: 50% of EB and 50% of EPD
- The student who sums a mark of 5 or higher after the assessment of all the evaluation activities will pass the course.

a) Basic teaching (50% of final mark):

- Attendance at the presential sessions is not mandatory
- Basic teaching will be evaluated by written questionnaires through the Virtual Classroom, a comprehensive exam at the end of the semester and the evaluation of a report of a specific issue chosen at random.
- All these written tests intend to verify clearly and concisely the level of competency acquired through their education and training This requires the resolution of particular problems or specific biological situations.
- In the written tests a minimum of intelligibility will be required in the expression, i.e. abbreviations not accepted in English are not allowed.

The following tools are mainly used:

- short answer questions
- long answer questions
- calculated responses
- set combinations
- fill in blanks
- sort of sentences
- multiple choice (test types)
- true / false
- troubleshooting

Evaluation of Basic teaching (EB):

- Final exam **(20% of final mark)**
- Questionnaires on selected topics through the Virtual Classroom, **(20% of final mark)**
- Report about EB topics **(10% of final mark)**

b) Practical teaching (50% of final mark):

- Attendance at the sessions is not mandatory.
- Evaluation of practical teaching:
  - ❖ Assessment of questionnaires about laboratory practice sessions through the Virtual Classroom **(20% of final mark)**
  - ❖ Public presentation of a work, dealing with topics related to the subject but not covered in the sessions **(20% of final mark)**
    - Final questionnaire about the students presentations which is also made through the Virtual Classroom **(10% of final mark).** This 10% is calculated as follows: **2,5% × attendance** to oral presentations (4 sessions)

As a general rule, the evaluations through the Virtual Classroom will be held in the week following the completion of the contents to be evaluated. It is always recommended:

TO CONSULT THE VIRTUAL PLATFORM CALENDAR

IMPORTANT: No evaluable items determine the evaluation of others. This means that if someone does not make any assessable item, such as the final exam of EB, it simply will not count for the final mark.

- According to the existing university regulations, plagiarism in the performance of any assessable item is not allowed. Illegal copying will be prosecuted and may lead to a fail in the final mark.

- The students who opt for a final evaluation have the option to get 100% of the grade. The rating scheme is the same as for the continuous evaluation:
- Written exam of EB (presential): 20%
- EB Questionnaire (Virtual Classroom): 20%
- Report about an issue of EB (Virtual Classroom): 10%
- EPD Questionnaire (Virtual Classroom): 20%
- Presentation of a work (presential): 20%
- Questionnaire about students presentations (Virtual Classroom): 10%

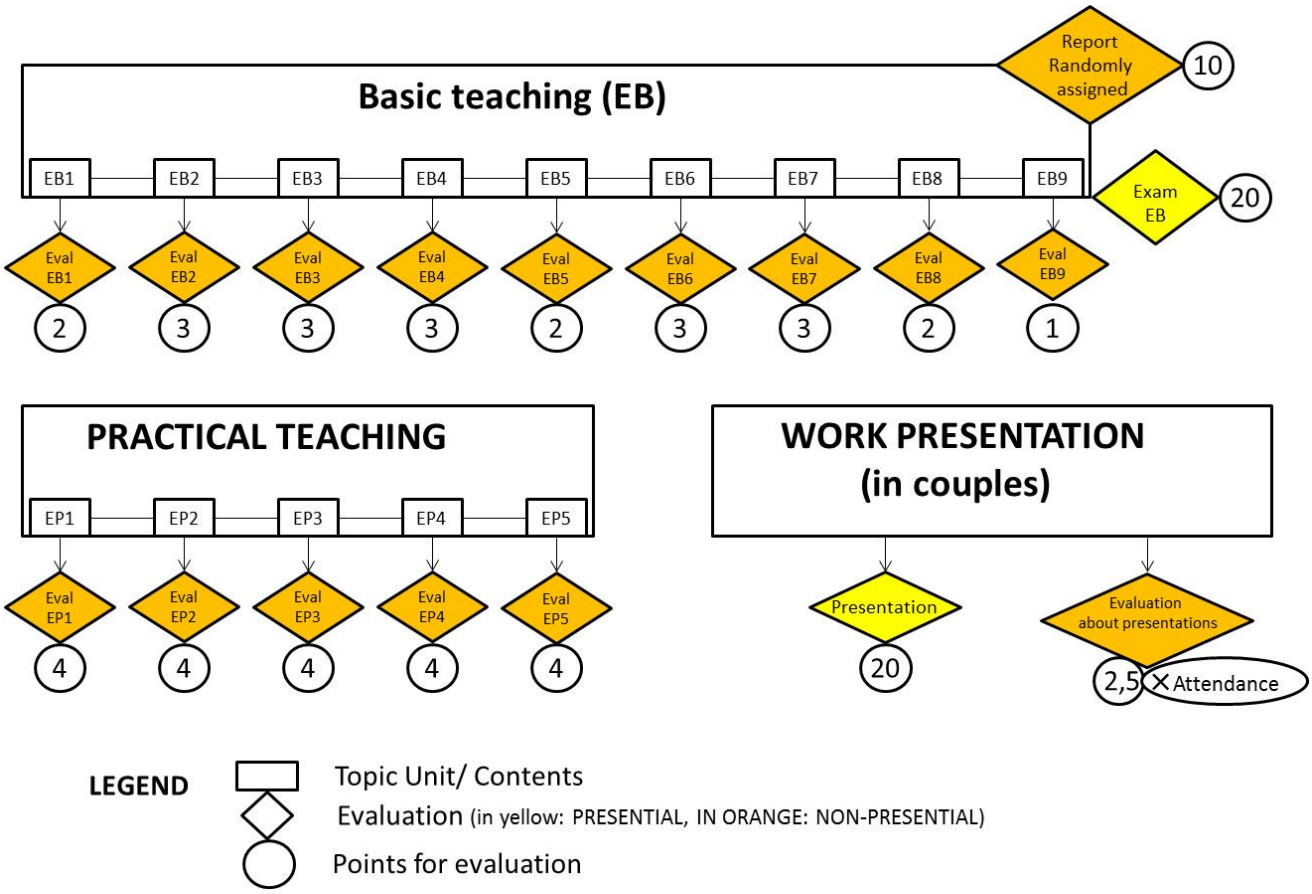
- According to University regulations, those students failing the course will have the possibility of being evaluated at the end of the course (resit exam). The rating scheme is the same as for continuous evaluation (see above). However, they are eligible for the evaluation of any of the items to consider at their discretion. The rating of the other evaluation sections will be taken from that

obtained previously in the first round of evaluation to guarantee the possibility of reaching 100% of the final grade.

- Although the student has successfully completed all the tasks carried out during the period of teaching, is entitled to be evaluated, under the following conditions:
- The evaluation will assess the total knowledge and skills contained in the Teaching Guide.
- The student expressly will waive all previously obtained qualification.

- For it:
- The student will be evaluated according to the same rating system followed during continuous evaluation.
- The student should expressly inform the professor with a minimum of 10 days before the conclusion of the tests, in order to facilitate the organization of the evaluation process.

TEACHING GUIDE
GENERAL SCHEME OF THE ORGANIZATION OF THE COURSE



Note: Take note that the evaluations of the nine topics of EB through Virtual Classroom (distance learning) total 22 points (no 20 points). Two additional points (Eval EB1) are supplied with the aim of students to get used to the virtual platform and the evaluation system.

8. RECOMMENDED LITERATURE

It is recommended to consult more than one bibliographic source. The University Library has several reference books in various editions. It is advised to consult the latest edition of a manual.

- ALBERTS, B. et al (2015). Molecular biology of the cell (6th Ed.). Garland Science, 9780815345244.

- COOPER, G.M. (2006) The Cell. A molecular approach. Fourth edition. ASM Press, Washington. 0-87893-219-4

- KARP, G. (2007) Cell and Molecular Biology. Fourth edition. John Wiley and sons, Inc, New York. 978-0-470-04217-5

- LODISH, H. y otros (2008) Molecular Cell Biology (Sixth edition). W.H. Freeman and Co., New York. 978-0-7167-7601-7

- POLLARD, D.T. et al (2008). Cell Biology (Second edition). Saunders. 978-1-4160-2255-8-

Finally, it is not recommended using books of earlier stages of education (ESO, Bachillerato,...) because the contents are not treated in the proper depth.
It is not recommended using notes made by students from previous courses.