Teaching Guide				
Identifying Data				2015/16
Subject (*)	Bioloxía Molecular		Code	610509016
Study programme	Mestrado en Investigación Química e Química Industrial			
Descriptors				
Cycle	Period	Year	Type	Credits
Official Master's Degree	1st four-month period	First	Optativa	3
Language	Spanish			
Teaching method	Face-to-face			
Prerequisites				
Department	Bioloxía Celular e Molecular			
Coordinador		E-mail		
Lecturers	Cerdan Villanueva, Maria Esperanza Lamas Maceiras, Mónica	E-mail	esper.cerdan@udc.es monica.lamas@udc.es	
Web				
General description	This course contains basic and fundamental concepts of research methods on biological processes that are performed on living cells.			

Study programme competences	
Code	Study programme competences
A1	Define concepts, principles, theories and specialized facts of different areas of chemistry.
A3	Apply materials and biomolecules in innovative fields of industry and chemical engineering.
A4	Innovate in the methods of synthesis and chemical analysis related to the different areas of chemistry
B1	Possess knowledge and understanding to provide a basis or opportunity for originality in developing and / or applying ideas, often within a research context
B4	Students should be able to communicate their conclusions, and the knowledge and the reasons that support them to specialists and non-specialists in a clear and unambiguous manner
B5	Students must possess learning skills to allow them to continue studying in a way that will have to be largely self-directed or autonomous.
B7	Identify information from scientific literature by using appropriate channels and integrate such information to raise and contextualize a research topic
B10	Use of scientific terminology in English to explain the experimental results in the context of the chemical profession
B11	Apply correctly the new technologies to gather and organize the information to solve problems in the professional activity.

Learning outcomes			
Learning outcomes	Study programme competences		
Knowing the basics for the isolation , cloning , expression and purification of proteins. Learn the basic techniques used to visualize biological processes in cell	AC1 AC3 AC4	BC1 BC4 BC5 BC7 BC10 BC11	

Contents	
Topic	Sub-topic

ITEM 1. Handling and DNA sequencing. 1. Sense of the subject (Introduction) This topic will address the description of the main tools and methods to manipulate genetic information and verify that the operations have been successful and have been conducted as they are designed .	2. Wording of the subject. Restriction enzymes and cloning vectors hybridization for the detection of specific sequences, PCR, DNA sequencing. 3. Bibliography - Molecular Biology of the Cell fifth edition (2008) . Alberts et al. Garland Science. Chapter 8. - Molecular Biology fourth edition (2008) . Robert F. Weaver. McGraw -Hill International Edition. Chapters 4 and 5. 4. Activities to develop. During the development of the subject practical cases that students must solve using the knowledge gained will arise. It could also be considered that students will read scientific articles related to the topic for exhibition / public presentation.
ITEM 2. Techniques for obtaining and analyzing proteins. 1. Sense of the subject (Introduction) We look at how, using the techniques seen in item 1, we can produce and purify proteins in the lab for testing its activity, determine its structure, etc.	2. Wording of the subject. Recombinant proteins , labeling of proteins, protein expression and purification , and protein sequencing analysis . 3. Bibliography - Molecular Biology of the Cell fifth edition (2008) . Alberts et al. Garland Science. Chapter 8. - Molecular Biology fourth edition (2008). Robert F. Weaver. McGraw -Hill International Edition. Chapters 4 and 5. 4. Activities to develop. During the development of the subject practical cases that students must solve using the knowledge gained will arise. It could also be considered that students will read scientific articles related to the topic for exhibition / public presentation.
ITEM 3. Viewing biological processes. 1. Sense of the subject (Introduction) In this issue the main methods of display structures and biological processes, both in vivo and in vitro will be explained.	2. Wording of the subject. Chemical markers , GFP and fluorescent fusion proteins , optical microscopy (confocal, super-resolution, real-time), electron microscopy. 3. Bibliography - Molecular Biology of the Cell fifth edition (2008). Alberts et al. Garland Science. Chapter 9. 4. Activities to develop. During the development of the subject practical cases that students must solve using the knowledge gained will arise. Also scientific work to read an comment by the students.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Problem solving	A1 A3 A4 B1 B5	7	24	31
Seminar	B4 B7 B10 B11	2	8	10
Mixed objective/subjective test	A1 A3 A4	0	2	2
Guest lecture / keynote speech	A1 A3 A4	12	20	32
Personalized attention		0		0
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description

Problem solving	Theoretical / practical class in which the teacher propose and students solve applications of theory, problems and applied questions. It may also imclude the presentation by students of a topic related to the subject. Small group interactive classes seminars , " S " in the timetables)
Seminar	Tutorials in very small group ("T" in the timetables) planned by the teacher and coordinated by the Tutoring Center. In general, each student will account for two hours per semester and subject. Monitoring activities as directed exercises, clarification of doubts about theory, problems, exercises, readings or other proposed tasks. Also the presentation, discussion or comments in small groups. Attendance at these classes is mandatory.
Mixed objective/subjective test	Test to evaluate skills and knowledge
Guest lecture / keynote speech	Lesson taught by the teacher who may have different formats (theory, problems and / or general examples, general guidelines on the matter ...). The teacher may have the support of audiovisual and computer media but, in general, students do not need to handle them in class.

Personalized attention	
Methodologies	**Description**

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Mixed objective/subjective test	A1 A3 A4	Final evaluation	60
Guest lecture / keynote speech	A1 A3 A4	Evaluation of attendance and participation	10
Problem solving	A1 A3 A4 B1 B5	Continuous assessment	15
Seminar	B4 B7 B10 B11	Continuous assessment	15

Assessment comments
Evaluation procedure. The assessment of this will be done through continuous assessment and the completion of a final exam.The access to the exam requires participation in at least 80% of classroom and teaching compulsory attendance activities (seminars and tutorials. Continuous assessment (N1) will weigh 40% in the total of the course and consist of two components: interactive small group classes (seminars) and interactive classes in very small groups (tutorials). Seminars and tutorials may include exercises and assignments made in person, exercises submitted to the teacheror public presentations of topics previously selected. The final exam (N2) will cover the entire content. The student's score, will be obtained as a result of applying the following formula: End = maximum Note (0.4 x 0.6 x N1 + N2, N2) N1 is the corresponding to the continuous assessment (scale 0-10) and N2 numerical final exam (0-10 scale numerical grade.

Sources of information	
Basic	- Molecular Biology of the Cell fifth edition (2008). Alberts y otros. Garland Science. - Molecular Biology fourth edition (2008). Robert F. Weaver. McGraw-Hill International Edition.- Molecular Biology of the Cell fifth edition (2008). Alberts y otros. Garland Science. - Molecular Biology fourth edition (2008). Robert F. Weaver. McGraw-Hill International Edition.
Complementary	

Recommendations
Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments
It is necessary to know the different kinds of biomolecules and processes of transfer of genetic information in cells. It is very important to attend the lectures. It is essential to keep the study of matter " up to day".

(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.