



## Teaching Guide

Identifying Data					2015/16
Subject (*)	Biotecnoloxía animal		Code	610475304	
Study programme	Mestrado Universitario en Biotecnoloxía Avanzada				
Descriptors					
Cycle	Period	Year	Type	Credits	
Official Master's Degree	2nd four-month period	First	Optativa	3	
Language	Spanish				
Teaching method	Face-to-face				
Prerequisites					
Department	Biología Celular e Molecular				
Coordinador	Mendez Felpeto, Josefina	E-mail	josefina.mendez@udc.es		
Lecturers	Insua Pombo, Ana Maria Mendez Felpeto, Josefina	E-mail	ana.insua@udc.es josefina.mendez@udc.es		
Web	mba.uvigo.es/				
General description	<p>Trátase dunha materia na que se pretende presentar aos alumnos os aspectos básicos de biotecnoloxía animal. Comprender os fundamentos de ferramentas moleculares para o estudo de genomas e como a través de marcadores moleculares poden ser identificadas especies, analizar poboacións desenvolver programas de mellora. Ademais de ferramentas e aplicación de tecnoloxías para o estudo da manipulación cromosómica e fertilización in vitro. Además de las herramientas y aplicación de las tecnologías para el estudio de la manipulación cromosómica y la fertilización in vitro. (Incorporación al POD de Dr Alberto Arias Pérez).</p>				

## Study programme competences

Code	Study programme competences
A21	Coñecer os recursos microbianos, vexetais e animais de interese biotecnolóxico así como as súas aplicacións na industria alimentaria e agropecuaria.
A24	Coñecer as estratexias de produción e mellora de alimentos por métodos biotecnolóxicos.
B1	Capacidade de análise e síntese (localización de problemas e identificación das causas e a súa tipoloxía).
B2	Capacidade de organización e planificación de todos os recursos (humanos, materiais, información e infraestruturas).
B3	Capacidade de xestión da información (con apoio de tecnoloxías da información e as comunicacións).
B4	Capacidade de planificación e elaboración de estudos técnicos en biotecnoloxía microbiana, vexetal e animal.
B5	Capacidade de identificar problemas, buscar solucións e aplicarlas nun contexto biotecnolóxico profesional ou de investigación.
B6	Capacidade de comunicación oral e escrita dos plans e decisións tomadas.
B7	Capacidade para formular xuízos sobre a problemática ética e social, actual e futura, que propón a Biotecnoloxía.
B8	Capacidade de comunicación eficazmente coa comunidade científica, profesional e académica, así como con outros sectores e medios de comunicación.
B9	Capacidade de Traballo en equipo multidepartamental dentro da empresa.
B10	Capacidade de Traballo nun contexto de sostibilidade, caracterizado por: sensibilidade polo medio ambiente e polos diferentes organismos que o integran así como concienciación polo desenvolvemento sostible.
B11	Racionamento crítico e respecto profundo pola ética e a integridade intelectual.
B12	Adaptación a novas situacións legais, ou novidades tecnolóxicas así como a excepcións asociadas a situacións de urxencia.
B13	Aprendizaxe autónoma.
B14	Liderazgo e capacidade de coordinación.
B15	Sensibilización cara á calidade, o respecto medioambiental e o consumo responsable de recursos e a recuperación de residuos.

## Learning outcomes

Learning outcomes	Study programme competences		
Knowing the opportunities offered by the development of animal biotechnology improvement programs ..	AC21		
	AC24		



Possess knowledge of ethical and legal issues related to animal biotechnology.	BC7 BC11 BC12
Promoting the ability to manage information (analysis and synthesis) related to animal biotechnology and transmission and effective communication of the same.	BC2 BC3 BC6 BC8
Promoting the ability to identify problems and solutions as well as planning and technical studies within the field of animal biotechnology	BC1 BC4 BC5
Promoting learning ability and adaptation to new situations and respectful work environment in the field of animal biotechnology.	BC9 BC10 BC13 BC14 BC15

Contents	
Topic	Sub-topic
Genomics and its application in the exploitation of natural animal variability.	Structural and functional genomics. Animal genomes. Paradox of Value-C. Genomic regions and their variation. Gene identification. Linkage maps.
Breeding and marker-assisted selection	Molecular makers: types, characteristics, development and analysis. Selection of quantitative traits in animals. Detection and analysis of QTLs. Use of identified genes in genetic improvement. Genome-wide association studies. Genomic selection.
Control of reproduction and assisted reproductive technologies in animals.	In vitro fertilization and embryo production Micromanipulation of gametes and embryos Determination of sex.
Chromosome manipulation in fish and shellfish	Poliploidy. Gynogenesis. Androgenesis. Monosex populations. Production of clones.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Laboratory practice	A21 A24 B9	8	8	16
Objective test	A21 A24 B1 B3 B4 B5 B6	0	7	7
Supervised projects	A21 A24 B1 B2 B3 B6 B7 B8 B9 B10 B13 B14	0	8.5	8.5
Guest lecture / keynote speech	A21 A24 B11 B12 B15	17	25.5	42.5
Personalized attention		1	0	1

(\*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Methodologies	Description
Laboratory practice	Visit a laboratory in which biotechnology tools used on reproduction in animals
Objective test	This test will be used to assess learning and knowledge, skills and abilities acquired in this field.
Supervised projects	Students perform in groups or individually a paper on some aspect of the matter



Guest lecture / keynote speech	Presentations were made by the participants in the course in order to convey a general knowledge of the subject teachers. The exhibitions will be held by videoconference and dialogue between students and teachers will be encouraged.
--------------------------------	---

### Personalized attention

Methodologies	Description
Supervised projects	Custom and group tutorials are possible. Physically or via videoconference, for advice on jobs and view any subject matter.

### Assessment

Methodologies	Competencies	Description	Qualification
Laboratory practice	A21 A24 B9	Attendance at practices will be assessed. Students respond to questionnaires on practice-visits they make.  Competencias avaliadas: A21, A24, B9	10
Objective test	A21 A24 B1 B3 B4 B5 B6	The objective test will allow the student to demonstrate mastery of the knowledge acquired on basic issues of matter. It will consist of several short questions about the contents explained by teachers.  Competencias avaliadas: A21, A24, B6, B7, B8, B10, B12, B15	40
Guest lecture / keynote speech	A21 A24 B11 B12 B15	Attitude attendance and participation in the dialogues promoted by teachers will be evaluated.  Competencias avaliadas: B6, B7, B10, B11, B12, B15	30
Supervised projects	A21 A24 B1 B2 B3 B6 B7 B8 B9 B10 B13 B14	Originality, degree of understanding of the subject matter, ability to synthesize and reviewed and consulted literature sources will be evaluated..  Competencias avaliadas: A21, A24, B1, B2, B3, B4, B5, B6, B7, B8, B11, B13, B14	20

### Assessment comments

A realización da proba obxetiva e imprescindible para ser avaliado.
A Matrícula de Honra otorgarase preferentemente entre os alumnos que acaden polo menos 9 na primeira oportunidade.

### Sources of information

<b>Basic</b>	<ul style="list-style-type: none"> <li>- Allis, D., Jenuwein, T., Reinberg, D. &amp; M.T. Caparros (2007). Epigenetics. Cold Spring Harbor Laboratory Press</li> <li>- Caetano-Anollés G., Gresshoff PM (1997). DNA markers: protocols, applications and overviews. Willey-Liss New York</li> <li>- Lewin B. (2008). Genes IX. McGraw Hill</li> <li>- Lynch, M (2007). The Origins of Genome Architecture. Sinauer Assoc., Sunderland</li> <li>- Piferrer, F., Beaumont, A., Falguière, J.C., Flajshans, Haffray, P., Colombo, L (2009). Polyploid fish and shellfish: production, biology, applications to aquaculture for performance improvement and genetic containment. Aquaculture 293: 125-156</li> <li>- Piferrer, F., Felip, A., Cal, R.M. (2007). Inducción de la triploidía y la ginogénesis para la obtención de peces estériles y poblaciones monosexo en acuicultura . En Genética y genómica en acuicultura. Observatorio Español de Acuicultura, Madrid.</li> <li>- Ruvinsky, A., Marshall-Graves, J.A. (2005). Mammalian Genomics. CABI Publishing</li> <li>- Cortés Rubio, E.&amp; Morcillo Ortega G. (2002). Ingeniería Genética. Manipulación de genes y genomas. Universidad Nacional de Educación a Distancia</li> <li>- Smith J.E. (2004). Biotecnología . Acribia S.A.</li> <li>- Thieman W.J. &amp; Palladino M.A. (2009). Introduction to Biotechnology Second Edition. Pearson International Edition</li> </ul>
--------------	--



Complementary

**Recommendations**

**Subjects that it is recommended to have taken before**

Enxeñaría xenética e transxénese/610475101

Enxeñaría Celular e Tisular/610475102

Xenómica e Proteómica/610475103

**Subjects that are recommended to be taken simultaneously**

Organización e xestión: xestión empresarial e xestión eficaz do laboratorio/610475201

Aspectos legais e éticos en Biotecnoloxía/610475203

Análise de alimentos, seguridade alimentaria e trazabilidade/610475302

**Subjects that continue the syllabus**

Reproducción asistida/610475502

**Other comments**

It is recommended to have knowledge of English comprehension level of scientific information sources for the proper learning of skills of the subject.

(\*)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.