



Teaching Guide

Teaching Guide				
Identifying Data				2017/18
Subject (*)	Animal biotechnology		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	Bioloxía			
Coordinador	Mendez Felpeto, Josefina	E-mail	josefina.mendez@udc.es	
Lecturers	Insua Pombo, Ana Maria	E-mail	ana.insua@udc.es	
	Mendez Felpeto, Josefina		josefina.mendez@udc.es	
Web	masterbiotecnologiaavanzada.com/			
General description	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.			

Study programme competences

Code	Study programme competences
A1	Saber buscar e analizar a biodiversidade de microorganismos, plantas e animais así como seleccionar os de maior interese biotecnolóxico (aplicado).
A5	Coñecer os principios da xenómica e a proteómica.
A7	Saber buscar, obter e interpretar a información das bases de datos biolóxicos: xenómicas, proteómicas, transcriptómicas e metabolómicas e utilizar as ferramentas básicas da bioinformática.
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 aplicalas 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		
Ability to identify the different biotechnological applications that animal resources have in the sector of food and agriculture.	AC21 AC24	BC1 BC3 BC4 BC5 BC6 BC7 BC8 BC10 BC11 BC12 BC13	
Ability to develop production strategies based on food improvement by biotechnological methods.	AC5 AC7 AC21 AC24	BC2 BC4 BC5 BC6 BC7 BC8 BC9 BC10 BC11 BC12 BC13 BC14 BC15	
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	AC5	BC2
	AC7	BC3
	AC21	BC5
	AC24	BC7
		BC8
		BC10
		BC12
		BC13
		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	A24 A21 B9	8	8	16
Objective test	A1 A5 A7 B1 B3 B4 B5 B6	0	7	7
Supervised projects	A5 A1 B1 B2 B6 B7 B8 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.
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Assessment			
Methodologies	Competencies	Description	Qualification
Supervised projects	A5 A1 B1 B2 B6 B7 B8 B10 B13 B14	Originality, degree of understanding of the subject matter, ability to synthesize and reviewed and consulted literature sources will be evaluated..	20
Guest lecture / keynote speech	A21 A24 B11 B12 B15	Attitude attendance and participation in the dialogues promoted by teachers will be evaluated.	20
Laboratory practice	A24 A21 B9	Attendance at practices will be assessed. Students respond to questionnaires on practice-visits they make.	10
Objective test	A1 A5 A7 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.	50

Assessment comments
To be assessed it is necessary to carry out the objective test. Preferably, first class honors will be awarded in June among students with a score of 9 or higher.

Sources of information	
Basic	- Lynch, M (2007). The Origins of Genome Architecture. Sinauer Assoc., Sunderland - Lewin B. (2008). Genes IX. McGraw Hill - Allis, D., Jenuwein, T., Reinberg, D. & M.T. Caparros (2007). Epigenetics. Cold Spring Harbor Laboratory Press - Ruvinsky, A., Marshall-Graves, J.A. (2005). Mammalian Genomics. CABI Publishing - 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. - 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 - Cortés Rubio, E.& Morcillo Ortega G. (2002). Ingeniería Genética. Manipulación de genes y genomas. Universidad Nacional de Educación a Distancia - Thieman W.J. & Palladino M.A. (2009). Introduction to Biotechnology Second Edition. Pearson International Edition - Smith J.E. (2004). Biotecnología . Acribia S.A.
Complementary	

Recommendations
Subjects that it is recommended to have taken before
Genetic Engineering and Transgenetics /610475101 Cellular and Tissue Engineering/610475102 Genomics and Proteomics/610475103
Subjects that are recommended to be taken simultaneously
Organisation and management of a laboratory/610475201 Legal and ethical aspects in Biotechnology/610475203 Analysis of foodstuff. food security and traceability /610475302
Subjects that continue the syllabus
Assisted reproduction technology/610475502



Other comments

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

(*)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.