



IDENTIFYING DATA

Genetic Engineering

Subject	Genetic Engineering			
Code	V02M123V01105			
Study programme	(*)Máster Universitario en Ciencias Biológicas: Biología Molecular, Computacional e Ambiental e Bio-Industrias			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	1st	1st
Language				
Department				
Coordinator	Pérez Rodríguez, Montserrat			
Lecturers	Gestal Mateo, Camino Pérez Rodríguez, Montserrat Rotllant Moragas, Josep			
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Web				
General description				

Competencies

Type A	Code	Competences Specific
	A1	(*)To know the scientific method and the correct use of the scientific terminology as well as to acknowledge the contribution that scientific research provides to the overall knowledge and professional practice.
	A2	(*)Ability to describe and to analyse biological diversity, the mechanisms determining the interactions with the biotic and abiotic environment and being able to select those which might have technical applications.
	A3	(*)Ability to manage and/or to develop basic tools for validating and analysing data by means of statistics and bioinformatics.
	A4	(*)To know the ethical and legal aspects governing the collection and the handling of biological samples, organisms and habitats.
	A5	(*)Ability to design, evaluate and implement models of biological structures, systems and processes.
	A6	(*)To learn the sampling techniques and the instrumental methodologies, in the field and laboratory, for their application in the Biological Sciences
	A7	(*)To have an integrated view of the R&D processes and their possible transfer to the industrial sector. Planning and supervising facilities together with managing their human and economic resources.
	A8	(*)Ability to classify, evaluate, conserve, restore and manage natural and productive systems. Developing and implementing land management and sustainability plans.
	A9	(*)To understand and know how to apply quality control systems and safety protocols in any biological laboratory of the public or private sector.
	A10	(*)To acquire the professional ability to teach and spread Biology and to offer expertise advice for elaborating scientific, technical and socioeconomic biology reports. Address environmental consulting.

A11 (*)To perform an individual Master Project (critical and in-depth study) under the supervision of a tutor in a research or working environment demonstrating that skills have been acquired.

Type B Code Competences Transversal

B1	(*)Dissemination of results and conclusions of the biological studies, in oral and written English, through complex presentations that address ideas related with R&D in Biology.
B2	(*)Managing computational, laboratory, field and industrial techniques in order to obtain, process and apply the acquired information.
B3	(*)Disseminating and broadcasting ideas in contexts both academic and non-specialised.
B4	(*)Reflecting on social and ethical responsibilities.

Learning aims

Subject competences	Typology	Competences
(*)A4, A10, A9	know Know How	A4 A9 A10 B1 B2 B3 B4

Contents

Topic	
Chapter I-INTRODUCTION	Evolution of molecular genetics.
Chapter II. FUNDAMENTALS: Fundamentals of Genetic Engineering.	The technology of restriction enzymes. DNA-RNA cloning vectors. Recombinant DNA. Gene transfer: transfection and transduction. Methods of clonal selection. Methods of DNA sequencing.
Chapter III APPLICATIONS OF RECOMBINANT DNA TECH	Sequencing strategies. Exogenous gene expression. Expression of recombinant proteins. Knockdown and knockout technologies. Transgenic expression. GMOs.

Planning

	Personalized attention	Assessment	Ordinary class hours A	Face-to-face hours outside the classroom Guided academic environment B	Student's work factor C	Outside the classroom hours D	Total hours (A+B+D) E
Seminars	<input type="checkbox"/>	<input type="checkbox"/>	6	0	3	18	24
Master Session	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12	0	3	36	48
Workshops	<input type="checkbox"/>	<input type="checkbox"/>	6	0	10	60	66
Short answer tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	0	1	2	4
Practical tests, real task execution and / or simulated.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4	0	1	4	8
Total hours E:							150
Work load in UVIGO ECTS credits:							6

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

Methodologies

	Description
Seminars	Students presentations about one of the topics included in the subject contents.

Master Session	Individual lectures of about 2 h that will cover the topics included in the subject contents.
Workshops	Practical work will be carried out through resolution of questions and problems.

Personalized attention

	Description
Master Session	A personalized attention to students requirements will be maintained during master sessions

Assessment

	Description	Qualification
Short answer tests	Written exams on the subject contents.	50
Practical tests, real task execution and / or simulated.	answer short questions related with practical work	50

Other comments and second call

Sources of information

Desmond S. T. Nicholl , An Introduction to Genetic Engineering, Third, cambridge

Recommendations

Subjects that continue the syllabus

Genomics and Gene Expresión/V02M123V01106

Other comments

Basic knowledge on : a) cellular biology, b) laws of inheritante, c) molecular biology and evolution