## Universida<sub>de</sub>Vigo

Subject Guide 2023 / 2024

Technics in	cellular and molecular biology			
Subject	Technics in cellular and molecular biology			
Code	V02G031V01310			
Study programme	Grado en Biología			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	2nd
Teaching language	Spanish			
Department				
Coordinator	Morán Martínez, María Paloma			
Lecturers	de Carlos Villamarín, Alejandro Leonides			
	Faro Rivas, Jose Manuel Galindo Dasilva, Juan Megías Pacheco, Manuel			
	Morán Martínez, María Paloma			
	Pérez Fernández, Juan			
	Suárez Alonso, María del Pilar			
E-mail	paloma@uvigo.es			
Web				
	complete and extend the knowledges purchased pole s the first course of degree and in the practices of labora this will make different experimental protocols in the la technical and conceptual level. The different technicial areas of the *Bioloxía. The educational method is main complementary readings and tools to achieve an integ apply them the an experimental problem from different least partly, in English. The schedules of the matter and dates of the examinat	student in the ma atory of the matter aboratory that are no will group in mo- ly based in the wo ration of the know t technical points tion can consult in	tter of basic technic rs of the course sec e considered how ad odules second his re ork of laboratory, bu vledges of the divers of view. The materi	ians of laboratory of ond of degree. For vanced pole his elation with distinct at also incorporates se fields and can al of work will be, at o page gives faculty.
Training an	nd Learning Results			
Code				
A1 Student	ts should prove understanding and knowledge in this st	Idv field that star	ts in the Secundary	Education and with
a level	that, even though it is supported in advanced books, a iguard of the study field.	lso includes some	e aspects that involv	e knowledge from
A2 Student have th	ts should know how to apply their knowledge to their we be competences that are usually proved through the ela	ork or vocation in boration and defe	a professional way. nce of arguments a	They also should nd the resolution of
A3 Student	ts should prove ability for information-gathering and interested a	erpret important o	data (usually within	their study field) to
B2 Manage	e scientific-technical information using diverse and relia	ble sources Analy	ze data and docum	ents and interpret
them ci B4 Draft a	ritically and rigorously, including considerations on their nd write reports, documents and projects related to Biol	social relevance	and in the professio	nal field of Biology.
teachin C2 Identify	g and specialized areas, highlighting the competences	of the degree.	mens and fossils. Ca	arry out
phyloae	enetic analyses and study the mechanisms of heredity.	evolution and bio	diversity.	,
C4 Isolate, their m	identify and growth microorganisms, cells, tissues and etabolic activity.	organs, making e	asier their study and	d the assessment of
C5 Manipu applica	late and analyse genetic material and determine its alte tions of genetic engineering.	erations and patho	ological implications	. Knowing the
C6 Underst their ho	tanding and integrate the functioning of living beings (comeostatic and adaptive responses.	ellular, tissue, org	an and individual le	vel), explaining

- C10 Identify biological and biotechnological processes and their potential applications, in particular in health, agri-food and environmental fields.
- C11 Perform and interpret bioassays, identify chemical and biological agents, including pathogens, as well as their toxic products. Develop and apply biological control techniques.
- D4 Collaborate and work in teams or multidisciplinary groups, promote negotiation skills and the ability to reach agreements.

Expected results from this subject					
Expected results from this subject	Training and Learning				
			Results		
Recognise the versatility, potentiality and limitations of the technicians applied to the Biology.	A1 A2 A3	B2 B4	C2 C4 C5 C6 C10 C11	D4	
Know and handle the concepts, terminology and scientific instrumentation-technical relative to technicians of laboratory.	A1 A2 A3	B2 B4	C2 C4 C5 C6 C10 C11	D4	
Know apply technicians to isolate, identify, handle and analyse specimens and samples of biological origin, as well as to characterise his cellular and molecular constituents.	A1 A2 A3	B2 B4	C2 C4 C5 C6 C10 C11	D4	
Comprise the experimental base that bears the current knowledge on the molecular bases of the biological information and his expression.	A1 A2 A3	B2 B4	C2 C4 C5 C6 C10 C11	D4	

Contents	
Торіс	
Cellular and molecular analysis (Module I ,12 h)	Organs lymphoid, extraction of cells lymphoid cellular SeparationCounting and cellular feasibility cellular Conservation ELISA
Technicians advanced in microscopy (Module II, 12 h)	Inmunocitochesmisty Microscopy Of fluorescence Electronic microscopy
Purificaction and characterisation of proteins (Module III, 20 h)	Spectrometry of masses of proteins Chromatography of proteins Electrophoresis of proteins Assessment of the enzymatic activity of proteins
Recombinant DNA and sequencing (Module IV, 20 h)	Extraction of nucleic acids PCR and quantification Cloning and transformation Gene Expression Sequencing analysis

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	Class hours	Hours outside the classroom	Total hours
Introductory activities	0.5	0	0.5
Laboratory practical	58	0	58
Autonomous problem solving	0	39	39
Report of practices, practicum and externa	I practices 0	29	29
Objective questions exam	0.75	11	11.75
Objective questions exam	0.75	11	11.75
*The information in the planning table is for	r guidance only and does no	ot take into account the het	erogeneity of the students.

	Description
Introductory activities	It describes the method of work that goes to be followed
Laboratory practical	It presents to the student of the most real form the experimental character of the Biology
Autonomous problem solving	It can be proposed in some modules with material in English, Galician or Spanish. It allows to purchase a better understanding of an experimental technician and a greater autonomy in his realisation. In some modules will be necessary to use computer tools or make mathematical calculations and /or statisticians.

Personalized assistance			
Methodologies	Description		
Laboratory practical	Personalized attention to resolve any doubt that have arisen during the teaching of the matter. The doubts can consult in the hours of *tutoría weekly.		
Autonomous problem solving	Personalized Attention to resolve any doubt that have arisen during the realisation of the no face-to-face activities. The doubts can consult in the hours of tutorials.		

Assessment					
	Description	Qualification	T Lea	raining rning R	and esults
Laboratory practical	It evaluates the degree of interest and participation of the student, the punctuality and know be, in addition to the assimilation of the work developed during the practices.	20	A1 A2 A3	B2 C2 B4 C4 C5 C6 C10 C12	D4
Autonomous problen solving	They evaluate the knowledges purchased in the practical sessions, as well as the correction in the form to express in the tongue employed, English, Galician or Spanish (in particular, the grammatical construction, spelling and coherence of the text).	10	A1 A2 A3	B2 C2 C5 C6 C10 C12	D4 ) 1
Report of practices, practicum and external practices	They evaluate the knowledges purchased in the practical sessions, as well as the correction in the form to express in the tongue employed, English, Galician or Spanish (in particular, the grammatical construction, spelling and coherence of the text).	20	A1 A2 A3	B2 C2 B4 C4 C5 C6 C10 C12	D4 0 1
Objective questions exam	They evaluate the knowledges purchased in the practices and the complementary activities of the modules of cellular biology and of biochemistry	25	A1 A2 A3		
Objective questions exam	They evaluate the knowledges purchased in the practices and the complementary activities of the modules of immunologies and of genetics	25	A1 A2 A3		

## Other comments on the Evaluation

TBCM is a subject with mandatory practical sessions. Unjustified absence from one or more laboratory sessions is incompatible with passing this subject.

TBCM is a course that consists of four consecutive laboratory modules (Cell Biology, Biochemistry, Genetics, and Immunology) with continuous evaluation divided into two parts.

Part A: 50% of the final grade is determined by the sum of the grades obtained in each module. These grades can come from various activities such as result submissions, notebooks, solved questionnaires, or others, submitted on time. A minimum of three out of ten points must be obtained in each module. Circumstances such as lack of punctuality or a demotivated or negligent attitude in the laboratories can lower the final scores.

Part B: The remaining 50% of the final grade comes from the completion of 2 written tests, where questions related to the contents of the four completed modules are asked. Again, a minimum of three out of ten points must be obtained in each module's corresponding part.

If a student has a justified absence from two or more laboratory sessions, continuous evaluation is not possible. In that case, students would have to take an exam to pass the subject, in the form of a written test that consists of two parts:

Theoretical part (50% of the final grade): Four exams with questions about the contents of each of the four modules that make up the subject. A minimum of three out of ten points must be obtained in each module to pass.

Practical part (50% of the final grade): Resolution of a practical case from each of the four modules that compose the subject. Similarly, a minimum of three out of ten points must be obtained in each module.

Sources of information	
Basic Bibliography	

Faro, J (coordinador e editor), **Manual de técnicas experimentais en bioloxía molecular e celular**, Servizo de Publicacións da Universidade de Vigo, 2014

Punt, J, Stranford, S, Jones, P y Owen, JA, **Kuby Immunology**, 8ª, WH Freeman and Co, 2019 Lefkovits, I, **Immunology methods manual: the comprehensive sourcebook of techniques**, 1997 Green, RM, **Molecular Cloning: A Laboratory Manual, Fourth Edition**, 2012 Nelson, DL y Cox, MM, **Lehninger: principios de bioquímica, 7a ed**, 2018 Bozzola, JJ y Russell, LD, **Electron microscopy : principles and techniques for biologists**, 1999 Hunter, E, **Practical electron microscopy: a beginner's illustrated guide**, 1993 Hayat. MA, **Principles and techniques of electron microscopy: biological applications**, 2000 **Complementary Bibliography** Valverde, D, Megías, M y Morán, P,

https://www.youtube.com/channel/UCCk6B5Y\_qUD8T2a5OB7Ic-g/videos?shelf\_id=0&view=0&sort=dd,

## Recommendations

## **Other comments**

It recommends work in the matter of continuous form, review the basic mathematics, included the resolution of equations of first degree, \*logaritmos, exponential, linear interpolation, and basic statistics, included linear regression by square minima, and analysis of variance.