		Teachin	g Guide		
	Identifying Data				
Subject (*)	Cytogenetics			Code	610G02022
Study programme	Grao en Bioloxía				
	·	Desci	riptors		
Cycle	Period	Ye	ear	Туре	Credits
Graduate	1st four-month period	For	urth	Optional	6
Language	Spanish				·
Teaching method	Face-to-face				
Prerequisites					
Department	Bioloxía				
Coordinador	Mendez Felpeto, Josefina		E-mail	josefina.mende	z@udc.es
Lecturers	Martinez Martinez, M. Luisa		E-mail	m.l.martinez@u	udc.es
	Mendez Felpeto, Josefina			josefina.mende	z@udc.es
Web	www.udc.es/grupos/xenomar				
General description	This is a course focusing on the study of eukaryotic chromosome from the structural, functional and evolutionary				
	perspective. In this area seek to improve the knowledge acquired in the molecular genetics and genetic materials. Special				
	emphasis on the organization of the genetic material and their implications in the evolution of genomes, their variation and				on of genomes, their variation and
	handling will be done.				

	Study programme competences		
Code	Study programme competences		
A1	Recoñecer distintos niveis de organización nos sistemas vivos.		
A2	Identificar organismos.		
A11	Identificar e analizar material de orixe biolóxica e as súas anomalías.		
A16	Realizar cultivos celulares e de tecidos.		
A26	Deseñar experimentos, obter información e interpretar os resultados.		
A29	Impartir coñecementos de Bioloxía.		
A30	Manexar adecuadamente instrumentación científica.		
A31	Desenvolverse con seguridade nun laboratorio.		
B1	Aprender a aprender.		
B2	Resolver problemas de forma efectiva.		
В3	Aplicar un pensamento crítico, lóxico e creativo.		
B5	Traballar en colaboración.		
В6	Organizar e planificar o traballo.		
B8	Sintetizar a información.		
В9	Formarse unha opinión propia.		
B10	Exercer a crítica científica.		
B11	Debater en público.		

Learning outcomes	
Learning outcomes	Study programme
	competences

	A1	B1	
	A16	B2	
Deepen your knowledge of the organization of hereditary material with an evolutionary approach through the study of	A26	В3	
chromosomes and their variations.	A30	B5	
	A31	В6	
		B8	
		В9	
		B10	
		B11	
To understand the fundamentals involve when learning about chromosome and familiar with the basic methodology employed	A1	B1	
for the study of chromosomes.	A2	B2	
Tools for cytogenetics.	A11	В3	
	A16	B5	
	A30	В6	
	A31	B11	
Search and use of different literature and databases that allow carrying out the scientific approach to a topic related to	A29	В3	
chromosomes sources, organization, function and evolution.		В8	
Management information sources of interest in cytogenetics.		В9	
		B10	

	Contents		
Topic	Sub-topic		
Block 1 Structural and Organization Genomes	1Organization of genomes from viruses to eukaryotes. Evolutionary aspects.		
	2The chromosomes are chromatin		
	3Levels of organization		
	4 - Structure of metaphase chromosomes		
	5Induced chromosome structure: Bands vs isocoras.		
	6Linkage and mapping		
Block 2 Chromosomes, celular reproduction and function	1Control of the cell cycle. Cycle disorders		
	2 - Evolution of the mitotic mechanism		
	3replication and chromosomal regions		
	4Evolution of meiosis and its genetic consequences. Meaning of sexual		
	reproduction.		
	5 - Different karyotypes and their use		
	6Chromosomes and gene function		
Block 3Chromosome variation and evolution	1Chromosomal rearrangements and their significance in evolution.		
	2Genetic consequences of numerical and structural variations .		
	3 Chromosomal polymorphisms: evolutionary aspects.		

	Planning			
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Collaborative learning	A1 A2 A11 A16 A30 A31 B1 B2 B3 B5 B6 B11	28	56	84
Oral presentation	B5 B6 B8 B9 B10 B11	12	0	12
Objective test	A1 A16 B3 B8 B9 B10	2	25	27

Guest lecture / keynote speech	A26 A29 B1 B8 B11	8	0	8
Laboratory practice	A11 A16 A26 A29	15	0	15
	A30 A31 B1 B5			
Personalized attention		4	0	4

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

	Methodologies		
Methodologies	Description		
Collaborative learning	Students work in groups of 2 or 3 and work collaboratively to effectively solve an assigned topic each block. They should learn		
	to arrange and organize work among them. Perform appropriate to the subject under study literature searches .		
	It is a mandatory activity		
Oral presentation	The collaborative work by the group, will be presented orally at the end of each block. Throughout the course there will be at		
	least three oral presentations for each student. It will consist of transmitting the rest of the seminar co-dossier prepared by the		
	gruo (2-3 students) together.		
	Each team member will present a part of the joint seminar, trying to fit it in coordination with their peers. It is a mandatory		
	activity.		
Objective test	Students will perform a final test consisting of different short questions that reflect different aspects learned throughout the		
	course		
	It is mandatory activity.		
Guest lecture /	The teacher explains the fundamental contents of each thematic block and identifies the associated activities.		
keynote speech	Attendance at these lectures and interactive sessions will be positively evaluated.		
	The assitance will be assessed.		
Laboratory practice	Laboratory practices related to the development of chromosomes and karyotypes were developed.		
	It will be know the cell cultures, making the karyotype and develop some method of chromosome banding.		

Personalized attention			
Methodologies	Description		
Laboratory practice	Throughout the course, the teacher will be available during the hours of interactive lectures, group tutorials / small group and		
Collaborative learning	individual tutoring for answering questions, guiding the development of seminars / group work and all matters related to the		
	organization of matter.		

Assessment			
Methodologies	Competencies	Description	Qualification
Guest lecture /	A26 A29 B1 B8 B11	In the keynote session, the teacher will explain the fundamental contents of each	10
keynote speech		thematic block of matter. Attendance at these classes enables the treatment of	
		questions and issues that may arise and further clarifies and organizes collaborative	
		work group will be further developed and that will be lectures on oral presentations.	
		Assisting them continuously is recommended.	
Objective test	A1 A16 B3 B8 B9 B10	The final test will take place on the field marked by the Faculty. Consist of a few short	40
		questions about the novel contributions learned in the course ideas and reflection of	
		learning as well as the realization in the responses, personal opinions and scientific	
		literature specific answers to questions will be assessed.	
Oral presentation	B5 B6 B8 B9 B10 B11	Clarity and precision in the presentation will be assessed. Suitable and current	20
		content. Synthesis capacity, motivation and debate. Both the submitted writen report	
		and oral presentation will contribute to the assessment.	

Laboratory practice	A11 A16 A26 A29	Take into account the interest to learn techniques on chromosomes, skill in the	10
	A30 A31 B1 B5	laboratory experiments ability to solve chromosomes and the attitude and ability to	
		function in the laboratory.	
Collaborative learning	A1 A2 A11 A16 A30	Students will form working groups and the way teamwork is valued, how they solve	20
	A31 B1 B2 B3 B5 B6	the problems, the strategy when conducting literature searches to resolve the issue	
	B11	raised and its ability to incorporate new knowledge acquired in years above. Group	
		work and coordination are essential in this regard. Their aptitude and attitude will be	
		assessed throughout the course.	

Assessment comments

The final test and practical clases are essential and mandatory activity.

In the case of justified exceptional circumstances, additional measures may be taken so that the student can pass the subject, such as flexibility in the delivery date of supervised projects, flexibility in practice schedules or a global assessment test of the learning results.

	Sources of information
Basic	- Brown T.A. Genetics: A molecular approach (third edition). Chapman & Hall 1998-Brown, T.A. Genomas (Tercera
	edición). Editorial Médica Panamericana S.A. 2008-The evolution of te genomes. Edited by T.Ryan Gregory. Elsevier
	Academic Press. 2005-Lacadena, J.R. Citogenética Editorial Complutense S.A. 1996- Lewin, B. Genes IX.
	McGrawHill Education 2008-Lima de Faria, A. One hundred years of chromosome research and what remains to be
	learned. Kluwer Academic Publishers 2003- Lynch M. The origins of genome architecture Sinauer Associates, Inc
	Publishers. 2007-Macgregor, H.C. An Introduction to Animal Cytogenetics. Chapman & Hall 1993-Macgregor, H. &
	Varley, J. Working with Animal Chromosomes (second edition) John Wiley & Sons. Toronto 1988-Wagner R.P.;
	Maguire M.P. & Stalling R.L. Editorial Wiley-Liss 1993
Complementary	En primer lugar, los alumnos consultarán los libros recomendados en las materias de Genética y Genética Molecular
	para recordar los contenidos y conocimientos adquiridos previamente. A continuación realizarán una búsqueda
	bibliográfica específica en libros, artículos de revisión, publicaciones específicas que permitan incrementar el
	aprendizaje de la materia, teniendo como eje fundamental el cromosoma mitótico.La realización de una buena
	búsqueda bibliográfica estará presente en todas las valoraciones de las actividades propuestas.

Recommendations	
Subjects that it is recommended to have taken before Biology: Basic Levels of Organisation of Life I (Cells)/610G02007	
Molecular Genetics/610G02020	
Subjects that are recommended to be taken simultaneously	
Subjects that continue the syllabus	
Other comments	

(*)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.