UniversidadeVigo

IDENTIFYING DATA
(*)Xenómica Mariña

Subject	(*)Xenómica Mariña
Code	V02M098V01214
Study programme	(*)Máster Universitario en Bioloxía Mariña

Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Optional	1st	2nd

Teaching language	Spanish
Department	
Coordinator	Presa Martínez, Pablo Castro Tubio, José M.
Lecturers	Castro Tubio, José M. Presa Martínez, Pablo
E-mail	pressa@uvigo.es JMCTUBIO@GMAIL.COM
Web	http://http://darwin.uvigo.es/mobgenomes/
General description	During the last decade have been witnesses of an important development of the methodologies of *secuencación genomic, that has carried to an exponential increase of the knowledge of the eukaryotic genomes. These new technologies Are applying also to the knowledge of the genomes of the marine organisms. This subject pretends to approach to the student to these technological advances, so that it purchase the necessary knowledges to confront to the new challenges of the genomics of the 21st century applied to the study of the half marine.

Competencies

Code	
A1	(*)Posuír e comprender coñecementos que acheguen unha base ou oportunidade de ser orixinais no desenvolvemento e/ou aplicación de ideas, adoito nun contexto de investigación.
A2	(*)Que os estudantes saiban aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornos novos ou pouco coñecidos dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo.
A3	(*)Que os estudantes sexan capaces de integrar coñecementos e se enfrontar á complexidade de formular xuízos a partir dunha información que, sendo incompleta ou limitada, inclúa reflexións sobre as responsabilidades sociais e éticas vinculadas á aplicación dos seus coñecementos e xuízos.
A5	(*)Que os estudantes posúan as habilidades de aprendizaxe que lles permitan continuar estudando dun xeito que terá que ser, en grande medida, autodirixido e autónomo.
B1	Utilización de criterios y métodos científicos en el planteamiento y resolución de problemas aplicando los conocimientos adquiridos
B2	Búsqueda, análisis e integración de información a partir de diferentes fuentes y capacidad para su interpretación y evaluación
B3	Aprendizaje de diversas técnicas y métodos analíticos tanto en el medio natural como en el laboratorio
B6	Desarrollo de la curiosidad científica, de la iniciativa y la creatividad
C2	Conocimiento de la diversidad de organismos marinos y sus estrategias adaptativas
C4	Conocimiento y búsqueda del potencial interés económico y biotecnológico de los organismos marinos
C8	Conocimiento y manejo de la metodología de investigación, de las técnicas muestreo e instrumentales y de análisis de datos aplicados al medio marino
D1	Desarrollo de las capacidades comprensivas, de análisis y síntesis
D2	Desarrollo de la capacidad de razonamiento crítico y autocrítico
D3	Desarrollo de las capacidades de trabajo en equipo, enriquecidas por la pluridisciplinariedad
D4	Desarrollo de la capacidad para actualizar el conocimiento de forma autónoma
D5	Desarrollo de las habilidades de comunicación y discusión de planteamientos y resultados

Learning outcomes

Expected results from this subject	Training and Learning Results
Know the main components of a genome, and the new technicians of *ultrasecuenciación for the study of the genomes of marine organisms	A1 A2 A3 A5 B1 B2 B3 B6 C2 C4 C8 D1 D2 D3 D4 D5

Contents

Topic	
The organisation of the marine genomes	The nuclear and the mitochondrial genomes. Chromosomes, genes and repetitive components of a genome. Karyotypes and sizes of marine genomes. Nucleotide variants and structure of the genome. Genetic databases.
Applications of NGS techniques to the analysis of marine genomes	New technologies of genomic ultrasecuenciation. Modalities of secuenciation of genomes and transcriptomes. Strategies of secuenciation for the identification of variants in a genome.Applications of the genomic sequencing to the study of marine organisms.
Setting new genomes of reference	Strategies for sequencing reference genomes. Scaffolding and appraisal of quality of contings (value of the parameter N50). Construction of genomic maps with data NGS. Annotation of a genome of reference. Appraisal to the size of a genome by means of the k-mers counting. Projects and databases of marine genomes of reference.
Applications of genomics to the study of the marine life.	Biodiversity and Biogeografy. Induced change and adaptative evolution. Marine genomics and aquaculture.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	13	26	39
Mentored work	12	24	36

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

Methodologies

	Description
Lecturing	The professor explains the theoretical contents of each subject. They will supply wide diagrams of the matter and a specific bibliography so that the student can deepen in the distinct subjects. The student assimilates and annotates concepts. It poses doubts and questions.
Mentored work	Destined interactive sessions to integrate and apply the knowledges purchased in the masterclasses..

Personalized assistance

Methodologies	Description
Lecturing	Attention in real time to the doubts of understanding.
Mentored work	Face-to-face orientation on the approach of the solutions.

Assessment

Description	Qualification	Training and Learning Results

Lecturing	The students, well individually or in group, will do a public presentation in the classroom (length 10 minutes, more 5 minutes of questions) on a scientific article related with the theoretical contents of the matter. It will be evaluated the understanding by the students of the content of the scientific work presented, as well as the capacity of communication and the resources employed in the exhibition.	80	A1 A2 A5	B1 B3 B6	C2 C4 C8	D2
Mentored work	Continuous evaluation: Assessment of the interest and competence in the resolution of practical cases proposed by the professor.	20	A1 A2 A3 A5	B1 B2 B3 B6	C8	D1 D2 D3 D4 D5

Other comments on the Evaluation

The first evaluation date of the course 2019/20 corresponding to the exhibition and defence of the practical case will be on 17 April 2020 (10-12h) and the second announcement on 7 July 2020 (12-14h). Qualifications obtained in the works of classroom evaluated along the course will be conserved until the end and represent 20% of the total note.
Individual tutorships is implemented ad libitum from 11:00 to 13:00 to solve any aspect of the concepts studied.

Sources of information

Basic Bibliography

Arthur M. Lesk, **Introduction to Genomics**, Tercera Edicción, Oxford University Press, 2017

T. A. Brown, **Genomes 4**, Cuarta Edicción, Garland Science, 2017

Complementary Bibliography

Recommendations

Subjects that it is recommended to have taken before

Genetic Diversity and its Application to Study of Marine Organisms/V02M098V01205

Other comments

The complementary bibliography will be proposed by the professor along the course and will consist in an up to date list of scientific articles employed as material of study and work.

Contingency plan

Description

=== EXCEPTIONAL MEASURES PLANNED AND ADAPTATION OF THE METHODOLOGIES ===
In the event of a partial or total return to possible confinement as a consequence of the covid-19 disease virus, the provision of classes is planned through the universities' own platforms or telematic systems. In the event that there is some kind of incompatibility of schedules or technical problems to access the online classes through these platforms, it is proposed as an alternative to upload the videos with the classes corresponding to each topic on YouTube-type platforms, to which students can access through a link that will be provided by each teacher. No changes are foreseen in the evaluation system, which will be carried out through the university's own platforms or through alternative Skype-type platforms in the event that the first ones fail.