Main course information	
Academic subject	Bioinformatics and Genome Variability
Degree course	Biological Sciences (three-year), Biosanitary Sciences (LM), Environmental Biology (LM).
Degree class	??
ECTS credits (CFU)	4
Compulsory attendance	Yes
Teaching language	italian
Accademic Year	2019/2020

Professor/Lecturer	
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Tutorial time/day	Upon request via e-mail

Course details	Pass-fail exam/Exam with mark out of 30	SSD code	Type of class
	Exam with mark out of 30	BIO11	Lecture/workshop

Teaching schedule	Year	Semester
	Free	2nd

Lesson type	CFU/ECTS	Lessons (hours)	CFU/ECTS lab	Lab hours	CFU/ECTS tutorial/workshop	Tutorial/workshop hours	CFU/ECTS field trip	Field trip Hours
	4	32	0	0	0	0	0	0

Time management	Total hours	Teaching hours	Self-study hours
	??	32	??

Academic Calendar	First lesson	Final lesson
	??	??

Syllabus	
Course entry requirements	Knowledge of molecular biology, genetics and biochemistry principles
Expected learning outcomes (according to Dublin Descriptors) (it is recommended that they are congruent with the learning outcomes contained in A4a, A4b, A4c tables of the SUA-CdS)	
Knowledge and understanding	The student must demonstrate that, based on the knowledge acquired, he is able to apply bioinformatics methods and interpret the results in a clinical and environmental context.
Applying knowledge and understanding	The student must demonstrate a conscious autonomy in the evaluation of the results obtained in the bioinformatics field.
Making informed judgements and choices	Acquisition of the appropriate vocabulary and terminology for the description of the methodological and instrumental approaches used for the analysis of omics data and their use in various basic and applied research areas.
Communicating knowledge and understanding	The student must demonstrate to be aware of and understand the principles on which the main biological databases and the methods of analysis of genomic data and its molecular derivatives are based.
Capacities to continue learning	Acquisition of the ability to investigate, update and read the evolution of the discipline with a critical spirit, through the consultation of scientific publications. genomic resources and databases and other information on the net.

Sylabus

Course content	Bioinformatics • Introductory principles of Bioinformatics • Biological databases: description and use with computer exercises using the bioinformatics resources available on the net • Introduction to the analysis of biosequences • Comparison between the Biosequences: alignments, multi-alignments and similarity research in biological databases and use of related algorithms available online. • Principles and methods for the study of molecular evolution • Notes on NGS techniques for the massive sequencing of genomes and on the methodologies for functional annotation of the genome • Methods for the prediction of macromolecule structures: RNA and Proteins
Course books/Bibliography	Helmer-Citterich M, Ferrè F, Pavesi G, Pesole G – Fondamenti di Bioinformatica Zanichelli Eds 2018
Notes	
Teaching methods	Frontal lessons with power point prepared by the teacher. At the end of each topic, computer exercises are performed by accessing databases and tools freely available on the web. Students receive a detailed protocol that allows the exercise to be repeated independently during individual study.
Assessment methods (indicate at least the type written, oral, other)	Oral
Evaluation criteria (Explain for each expected learning outcome what a student has to know, or is able to do, and how many levels of achievement there are	The oral exam is based on questions of a general nature in response to which an extended dissertation is expected to demonstrate how much the student has developed and assimilated the proposed topic.
Further information	