



## STRUCTURAL BIOINFORMATICS

<b>Enrollment year</b>	2020/2021
<b>Academic year</b>	2020/2021
<b>Regulations</b>	DM270
<b>Academic discipline</b>	INF/01 (COMPUTER SCIENCE)
<b>Department</b>	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
<b>Course</b>	ADVANCED BIOTECHNOLOGY
<b>Curriculum</b>	PERCORSO COMUNE
<b>Year of study</b>	1°
<b>Period</b>	2nd semester (01/03/2021 - 14/06/2021)
<b>ECTS</b>	6
<b>Lesson hours</b>	48 lesson hours
<b>Language</b>	Italian
<b>Activity type</b>	ORAL TEST
<b>Teacher</b>	CARUGO OLIVIERO ITALO (titolare) - 6 ECTS
<b>Prerequisites</b>	Basics in inorganic chemistry, organic chemistry, physical chemistry, molecular biology, biochemistry, and structural biology.
<b>Learning outcomes</b>	<p>At the end of the course, the students are expected to be able to understand and apply the most important techniques of structural bioinformatics to any problem of biochemistry and molecular biology. This includes:</p> <ul style="list-style-type: none"><li>(i) predictions of secondary, tertiary and quaternary structures of proteins;</li><li>(ii) validations of prediction methods;</li><li>(iii) use of the main databases.</li></ul>
<b>Course contents</b>	The course is divided into three main parts. (i) Introduction to molecular graphics to show and analyze the three-dimensional structures of proteins and protein complexes; (ii) Principal techniques of protein

	<p>structure prediction (secondary structure, conformational disorder, solvent accessibility, tertiary structure – homology modelling and fold recognition – quaternary structure, and functional annotation), introduction to the most important databases (PDB, CATH, SCOP etc.) and on-line resources for continuous education; (iii) Analysis of some computational techniques of structural bioinformatics, like support vector machines, artificial neural networks, molecular mechanics and molecular dynamics.</p>
<b>Teaching methods</b>	Lectures and guided exercises
<b>Reccomended or required readings</b>	Protein Bioinformatics: From Sequence to Function. M.Michael Gromiha, 2010, Academic Press.
<b>Assessment methods</b>	oral examination (one topic selected by the student and two topics selected by the lecturer) and brief practical exercise of molecular graphics.
<b>Further information</b>	oral examination (one topic selected by the student and two topics selected by the lecturer) and brief practical exercise of molecular graphics.
<b>Sustainable development goals - Agenda 2030</b>	<a href="#">\$lbl_legenda_sviluppo_sostenibile</a>