Course Code		BIO 221	BIO 230	BIO 301	BIO 471	BIO 401
Course Title		Biochemistry I	Introduction to Computational Biology	Ecology	Immunology	Evolutionary Biology
Type of course (compulsory, optional,)		compulsory	compulsory	compulsory	compulsory	compulsory
Level of course Is it a first, second or third cycle course?		First	First	First	First	First
Academic year of study		2nd Year of Study	2nd Year of Study	2nd Year of Study	3rd Year of Study	3rd Year of Study
Semester when the course will be offered		FALL Semester	FALL Semester	FALL Semester	FALL Semester	Spring Semester
Number of ECTS credits allocated		6 ECTS	6 ECTS	6 ECTS	6 ECTS	6 ECTS
Name of lecturer		Niovi Santama or Anna Charalambous	Vasilis Promponas	Spyros Sfenthourakis	Yiorgos Apidianakis	Alexander Kirschel
Are there any course prerequisites and/or co-requisites if any?(write the course codes if any)	prerequisites	NO	NO	NO	NO	NO
	co-requisites	NO	NO	NO	NO	NO
Course contents (description)		The course is designed to provide an understanding of the physical, structural and functional properties of the chemical components of living matter. The course will cover the three major classes of biological molecules: proteins, carbohydrates and lipids. Emphasis will be on the chemical properties and three-dimensional structure of these molecules in relationship to their biological function, as well as laboratory techniques for their isolation and characterization. Topics include: Protein structure and function, Hemoglobin-Structure, function and genetic disorders, Sugars and Polysaccharides, Lipids and biological membranes. Principles of thermodynamics, the mechanisms of enzyme action, enzyme kinetics, and the control mechanisms which regulate enzymatic reactions will be discussed. Principles governing metabolism, including bioenergetics, compartmentalization, the operation and control of pathways, the major metabolic pathways of carbohydrate metabolism, oxidative metabolism and lipid metabolism (i.e., triglycerides, phospholipids and sterols).	This course will demonstrate, through Lectures and Laboratory work, how Computational tools have revolutionized modern biological research with an emphasis on nucleic acid and protein sequence and structural analysis, also including an introduction to the analysis of complex biological systems. Lectures cover principles and methods used for sequence alignment, motif finding, structural modeling, structure prediction and network modeling. Laboratory practicals include examples on power usage of state-of-the-art methods/tools related to the topics covered in the lectures, and student mini-research projects based on programming and analysis of real-world datasets.	Introduction to Ecology. Interactions of biological systems with their environment. Principles and concepts of population and community ecology. The various concepts of niche and habitat. Life history tables. Cost-benefit analysis. The ecosystem approach. Energy flow and biogeochemical cycles. Productivity and food webs. Short-term field work where students will become familiar with basic ecological techniques. Platyhelminthes, Annelida, Nematoda, Mollusca, Arthropoda, Echinodermata and Chordata.	Introduction to immunology, with attention to the genetics, molecular, and cell biology of antibody production; T-cell mediated immune responses and innate immunity. Topics include the nature of antigens, hypersensitivities, transplantation, cytokines, autoimmunity, cancer, response to infection, and vaccines.	The course covers basic macro- and microevolution and the history of evolutionary biology. Topicsinclude natural and sexual selection, genetic drift and gene flow, phylogenetics and biogeography, speciation, co-evolution, species concepts, population genetics and systematics.
What are the course assessment methods (mid term, final exam, assignments) write yes or no next to each of the options	mid term exam	Yes	Yes	Yes	Yes	YES
	final exam	Yes	Yes	Yes	Yes	YES
	assignments	Yes	Yes	Yes	Yes	YES
Language of instruction		English	English	English	English	English