Course Title	**Advanced Immunology**				
Course Code	ABS310				
Course Type	Compulsory				
Level	BSc (Level 1)				
Year / Semester	3rd year / 6th Semester				
Teacher's Name	Prof. Maritsa Gourni, Dr Vasilia Tamamouna				
ECTS	6	Lectures / week	3	Laboratories / week	2
Course Objectives	This course is intended for students to build upon a basic level of knowledge on the immune system. Building on the course titled "Introduction to Immunology" a more in-depth studying of the structure, function and pathology of the immune system will be delivered. Students will be provided with a critical understanding of these features at the cellular and whole organism level. Special emphasis will be devoted to the molecular aspects and in describing the molecular mechanisms that underpin immunological reactions and defences against infections . Furthermore, this course aims to explore in more detail immune-related diseases of clinical importance and help students develop the critical thinking to better apply clinical immunological laboratory tests..				
Learning Outcomes	At the completion of this course students are expected to: • Have an advanced understanding on the intracellular signaling underlying the immune response to infection. • Understand the molecular basis of immune sensing, communication and response. • Elaborate on how the innate and adaptive immune systems respond to infection by different types of pathogenic microorganisms. • Understand the anatomy of the immune system, and the role of lymphoid and non-lymphoid organs in hematopoiesis, differentiation of immune cells and the immune response to infection. • Describe how tolerance mechanisms protect from autoimmunity, and how its impairment leads to autoimmune disease and allergy. • Understand the pathogenesis of tumorigenic diseases. • Provide examples of autoimmune disorders while understanding the role of the immune system in their pathogenesis. • Have a critical understanding of how immunological knowledge is employed in clinical diagnosis and treatment. • Know the current advances in immune therapy of infectious diseases, cancer and autoimmune disorders. • Understand the significance, explain the appropriate application of immunological tests and interpret and discus the results in the context of clinical diagnosis • Acquire the skills and competency in the execution of tests in the Clinical immunological laboratory				

Prerequisites	ABS209	Required	None
Course Content	Theory: • Introduction to the roles of the Immune System. • Current updates in immune molecules' nomenclature (CD molecules, IL molecules etc). • Innate Immune sensing (Pathogen-Associated Molecular Patterns and Pattern Recognition Receptors). • Adaptive Immune sensing (Antigens and lymphocyte receptors). • Diversity generation of lymphocyte receptors. • Anatomy and inter-communication of the Immune system. • Intracellular immune signalling and molecular immunology. • T-cell immunity. • B-cell immunity. • Macrophage immunity. • The MHC, antigen processing and presentation. • Microbiota and host immunity interactions. • Immunological memory. • Immune tolerance versus immunosuppression. • Acquired Disorders in Clinical Immunology - Allergy, Autoimmunity, Haematological Malignancy. • The role of different immune cell types in cancers. • Immune deficiency and Immunotherapy. • Mechanisms of drug treatments of immune diseases, vaccine development and engineering. Laboratory exercises: Students will be hosted in specialised Clinical laboratories where they will be trained and carry out hands on immunological tests covering both routine and specialized tests, as they are applied in the diagnosis of real life cases. Students will select examples of immunological cases and work individually under supervision, to follow the course of their selected disorder such as acquired, autoimmune or malignant, and become competent in the appropriate immunological tests that are used.		
Teaching Methodology	The teaching of the course includes lectures to help students understand the theoretical background, and demonstrations as well hands on training , by being hosted in a Clinical Laboratory in order to get a better comprehension of clinical immunological tests. Methods such as discussion, questions/answers, and pros/cons, are used to enhance student's participation. PowerPoint and image-rich material and short animations are used to better understand the content of Advanced Immunology. Students will be hosted in a Clinical Laboratory and will be trained in using the appropriate laboratory equipment, under the instructor's supervision. Appropriate preparation and demonstration by the laboratory supervisor precedes each laboratory exercise. Assessment of laboratory exercises includes laboratory reports submitted by each student as well as a case report that will be assigned to each student individually.		
Bibliography	Textbooks:		

	• Janeway's Immunobiology (Tenth Edition) 10th Edition, by Kenneth M. Murphy , Casey Weaver, Leslie J. Berg • Cellular and Molecular Immunology, 10th Edition, Authors : Abul K. Abbas & Andrew H. Lichtman & Shiv Pillai • Clinical Immunology: Principles and Practice • Roitt's Essential Immunology <u>References:</u> A list of recent articles will be provided for further reading.
Assessment	Course Work 40% • Mid-term Test 20% • Lab/case reports 20% Final Exam 60% For student evaluation, the overall grade is determined by a written midterm exam (20%), a laboratory grade (20%) and a written final exam (60%). The mid-term exam is carried out between the 6th and 8th week and it mainly includes short answer- questions and problem- solving questions and examines specific modules of the course. As far as the laboratory grade is concerned, it comprises of the evaluation of the laboratory reports (60% of the laboratory grade) submitted by the students after every experiment and a final laboratory examination (40% of the laboratory grade) which mainly includes short answer questions and problem-solving questions. In their laboratory reports, students are asked to describe the experimental procedure, to evaluate and analyse their results and to answer specific questions. The following criteria are taken into account when evaluating laboratory reports: (a) experimental data collection (30%), (b) data analysis (40%), and application of theory to draw conclusions (30%). The final exam of the course is carried out during the 14th-16th week of each semester and includes short answer questions, decision questions, and problem-solving questions regarding all course modules. The final assessment of the students is formative and summative and is assured to comply with the subject's expected learning outcomes and the quality of the course.
Language	Greek /English