

Subject Description Form

Subject Code	ABCT3101
Subject Title	Immunology
Credit Value	3
Level	3
Pre-requisite	ABCT2101 Biochemistry and ABCT2102 Molecular Biology
Objectives	<ol style="list-style-type: none"> 1. To provide a basic understanding of the principles of immunology, division of labor and cooperation of the various body cell types in bringing about defense of the body with emphasis on various control mechanisms of the immune system combating infection and disease. 2. To understand various diagnostic and research techniques in immunological research.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. Understand the roles of various components of the immune system and to appreciate the importance of the immune system in combating infection and disease. b. Be familiar with various mechanisms that the body possesses in fighting against pathogens and to predict harmful effects on the body when any of these mechanisms are not working properly including harmful effects of autoimmunity, immunodeficiency, and hypersensitivity. c. To understand various immunological techniques used in the biotechnology industry, biomedical research as well as public health applications such as immunization against various types of vaccines. d. Interpret and analyze data obtained in laboratory practical sessions.
Subject Synopsis/ Indicative Syllabus	<p><u>Components of the Immune system</u> Barriers, bactericidal components in various body fluids and cells of the innate and adaptive immune systems; soluble mediators of immunity including the complement system and cytokines; the lymphoid system.</p> <p><u>Activation of the immune system</u> Concept of clonal selection; activation and expansion of the B-cells and T cells; concept of MHC restriction and TCR recognition; exogenous and endogenous antigen processing; the antibody responses.</p> <p><u>Regulation of the immune system</u> Regulation and control of the immune responses by antigen and antibody concentrations, density and types of cytokine receptors; regulation by immune cell circuits and idiotypic regulation; interrelationship between the endocrine, nervous and immune systems.</p> <p><u>Antibodies and T-cell receptor (TCR)</u> Structure of antibody and TCR, generation of diversity, antigen recognition, processing and presentation.</p> <p><u>Vaccination</u> Antigens used as vaccines, effectiveness and safety of vaccine, currently used vaccines, adjuvants and passive immunization; possibilities in vaccination against tumor; latest development of vaccines.</p>

	<p><u>Failure of the immune system</u> Tolerance and autoimmunity, primary and secondary immunodeficiencies, and hypersensitivity.</p> <p><u>Others</u> Tumor Immunology, Transplantation</p>																																																		
<p>Teaching/Learning Methodology</p>	<p>Lectures are designed to foster understanding of concepts and principles of immunology, improve the student's ability to reason scientifically, and promote understanding of the roles of various components of the immune system and to appreciate the importance of the immune system in combating infection and disease. An active classroom approach is reinforced by teaching aids such as the personal response system. Multimedia means will be used to facilitate conceptual learning. Besides addressing intended learning outcome (a), through the active participation of students and peer-teaching, intended learning outcome (b) that knowledge on the various mechanisms that the body possesses in fighting against pathogens will be reinforced. Students will also be able to predict harmful effects on the body when any of these mechanisms are not working properly including harmful effects of autoimmunity, immunodeficiency, and hypersensitivity. Tutorials are organized to reinforce grasping of concepts and gauging the progress of students. To address intended learning outcome (c), laboratory practical sessions will be organized and students will be encouraged to develop a thorough understanding of various scientific methods and modern approaches of immunological techniques in the new world that are important for the biotechnology industry, biomedical research as well as from the public health perspectives. Through data analysis and interpretation of the data from laboratory practical sessions, intended learning outcome (d) will also be addressed. Moreover, students will be encouraged to develop a critical approach to problem solving, data handling, and graphics.</p>																																																		
<p>Assessment Methods in Alignment with Intended Learning Outcomes</p>	<table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="4">Intended subject learning outcomes to be assessed</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td>Midterm examination</td> <td>30</td> <td>√</td> <td>√</td> <td>√</td> <td></td> </tr> <tr> <td>Final examination</td> <td>35</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>Lab attendance and report</td> <td>15</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>Laboratory examination</td> <td>15</td> <td></td> <td></td> <td></td> <td>√</td> </tr> <tr> <td>Class attendance</td> <td>5</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td>100 %</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Students are required to attend at least 75% of scheduled sessions for the subject. Students fail to fulfill the attendance requirement will lose the 5% attendance score and not be eligible to register ABCT3109.</p>					Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				a	b	c	d	Midterm examination	30	√	√	√		Final examination	35	√	√	√	√	Lab attendance and report	15	√	√	√	√	Laboratory examination	15				√	Class attendance	5					Total	100 %				
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<p>Student Study Effort Expected</p>	<p>Class contact:</p>																																																		
	<ul style="list-style-type: none"> ▪ Lectures 		<p>24 Hrs.</p>																																																
	<ul style="list-style-type: none"> ▪ Tutorials 		<p>9 Hrs.</p>																																																
	<ul style="list-style-type: none"> ▪ Laboratory 		<p>6 Hrs.</p>																																																

	Total class contact:	39 Hrs.
	Other student study effort:	
	<ul style="list-style-type: none"> ▪ Student centred learning with problem-based components 	78 Hrs.
	Total student study effort	117 Hrs.
Reading List and References	1. Punt, Jenni, Stranford, Sharon, Jones, Patricia P., Owen, Judith A Kuby Immunology 8 th Edition, Macmillan Learning; 2019.	