

## Basic Immunology

<b>Department</b>	<b>Department of Medical Laboratory Sciences</b>						
Course Title /Code	<b>Basic immunology (MeLS2103 )</b>						
Program/Target Group	BSc Degree in Medical Laboratory Sciences Year: II Semester : II						
Module Title (Code)	Immunology and Molecular Biology (MeLSM2109)						
Module Coordinator	Name						
Course EtCTS	5 EtCTS						
Course Information	Academic Year : Meeting Day _____ Meeting Time _____ Meeting Location: <div style="text-align: right;">Class Room _____</div> <div style="text-align: right;">Lab Room _____</div>						
Instructor's Name	_____						
Instructor's Contact Information	Office No. _____ Phone No. _____ E-mail _____ Office Hour _____						
EtCTS	5 CP/ 135Hrs.						
Student Work Load	Lecture	Laboratory /practical	Tutorial	Independent Study	Assign ment	Assessment	Total
	48 Hrs.	0 Hrs.	6	60 Hrs.	9 Hrs.	12 Hrs.	135 Hrs.
Course Description	The course encompasses the topics: The immune system, Cells and organs of the immune system, Innate Immunity, Complement system, Antigens, Immunoglobulins: Structure , Function, Isotypes, Allotypes and Idiotypes, Genetics, Humeral immunity, Antibody Formation, Monoclonal antibodies, MHC and T cell receptors, Cell mediated immunity, Antigen processing and presentation, Cell-Cell interactions in immune responses, Cytokines, Maturation, Activation and Regulation of Lymphocytes, Immune System in Health and Disease, Tolerance and Autoimmunity, Hypersensitivity reactions, transplantation, Tumor Immunology, Assessment of						

	immune component, and Basic immunological techniques		
Course Objective	<p><b>1. General Objectives</b></p> <p>At the end of this course the student will be able to describe the immune system, autoimmunity, hypersensitivity, tumor immunology, and assessment of immune components.</p> <p><b>2. Instructional Objectives</b></p> <p>At the end of the course, students will be able to:</p> <p><b>Knowledge</b></p> <ul style="list-style-type: none"><li>• Define immune system</li><li>• List Components of the immune system</li><li>• Compare Innate and adaptive immune responses</li><li>• Explain Physiology of key lymphoid organs</li><li>• Describe Antibodies and Antigens in terms of sources, structure and function</li><li>• Discuss Antigen Processing and presentation to T-lymphocytes</li><li>• Explain Maturation, Activation, and Regulation of Lymphocytes</li><li>• Explain Effectors Mechanisms of Immune Responses</li><li>• Explain Immunity in Health and Disease</li><li>• Describe principles and techniques of vaccination</li><li>• Explain the type of Hypersensitivity reactions</li><li>• List the Immune deficiency diseases</li><li>• Explain immunological Tolerance</li><li>• Describe the Autoimmunity diseases</li><li>• Describe basic principles of immunological techniques</li><li>• Describe the methods of Assessment for immune component</li><li>• Describe the application of vaccination</li></ul>		
Pre-requisite(s)	No Pre-requisite		
Course Status	Core		
Mode of Delivery	Block		
Schedule			
Day	Contact	Topics and Sub Topics	Refere

	Hour		nce(s)
<b>One</b>	4 Hrs.	<b><u>Lecture</u></b>  <b>Chapter One: Introduction</b> 1.1.History of immunology 1.2.The immune system 1.3.Natural immune system 1.4.Adaptive immune system  <b>Chapter two: Innate and Adaptive immunity</b> <b>2.1.Innate immunity</b> 2.1.1. Anatomical barrier 2.1.2. Physiologic barrier 2.1.3. Inflammation 2.1.4. Phagocytosis  <b>2.2.Adaptive immunity</b> 2.2.1. Humoral immunity 2.2.2. Cellular immunity 2.2.3. Primary and secondary immune response	Ref No 1&2
	7 Hrs.	<b>Independent study</b>	
<b>Two</b>	4 Hr.	<b><u>Lecture</u></b>  <b>Chapter three: Cells and organs of the immune system</b> 3.1. Organs of the Immune system - Primary lymphoid organs secondary lymphoid organs  <b>3.2.</b> Cells of the immune system 3.3. Types and development of immune cells <b>3.4.</b> Function of immune cells	Ref No 2
	4 Hrs.	<b>Written Assignment one</b>	
	4 Hrs.	<b>Independent study</b>	
<b>Three</b>	4 Hrs.	<b><u>Lecture</u></b>  <b>Chapter four :Complement system</b>	

		4.1. Classical path way 4.2. Alternative pathway 4.3. Lectin pathway <b>Chapter five : Antigens</b> <b>5.1. Properties of antigens</b> <b>5.2. Types of antigens</b>	
	5 Hrs.	<b>Independent study</b>	
	2Hrs	<b>Reading for assignment</b>	
<b>Four</b>	2 Hrs.	<u><b>Lecture</b></u> <b>Chapter six: Immunoglobulin's:</b> 6.1. Structure & Function 6.2. Isotypes, Allotypes and Idiotypes 6.3. Genetics <b>Chapter seven : Humeral immunity:</b> 1.1. Antibody Formation, 1.2. Monoclonal antibodies. <b>Chapter eight :Receptors</b> 8.1. MHC 8.2. TCR 8.3. BCR	Ref No 1&2
	1 Hrs.	<b>Assessment</b> • <b>Test one</b>	
	5 Hrs.	<b>Independent study</b>	
	1Hrs	<b>Assignment for reading</b>	
<b>Five</b>	3 Hrs.	<u><b>Lecture</b></u> <b>Chapter nine: Cell mediated immunity</b> 9.1. Antigen processing and presentation 9.2. Cell-Cell interactions in immune responses <b>Chapter ten : Cytokines</b> <b>Chapter eleven: Effectors mechanisms of Cell Mediated and</b>	Ref No 1

		<p style="text-align: center;"><b>humeral immunity</b></p> <p style="text-align: center;"><b>chapter twelve: Maturation, Activation and Regulation of Lymphocytes</b></p> <p style="text-align: center;">12.1. B cell and T cell maturation, activation and differentiation</p>	
	5 Hrs.	<p><b>Assignment</b></p> <p>Written Assignment two</p>	
	1 Hrs.	<b>Independent study</b>	
<b>Six</b>	6 Hrs.	<p><b><u>Lecture</u></b></p> <p><b>Chapter thirteen: Immunoregulation</b></p> <p><b>Chapter fourteen: Primary and secondary Immune response.</b></p> <p><b>Chapter fifteen: Immune System in Health and Disease</b></p> <p>15.1.Immunity to parasites</p> <p>15.2. Immunity to viruses,</p> <p>15.3. Immunity to fungus,</p> <p>15.4.Immunity to bacteria</p>	Ref No 1&5
	1 Hrs.	<p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>• Test Two</li> </ul>	
	4 Hrs	<b>Independent study</b>	
	1Hrs	<b>Assignment for reading</b>	
<b>Seven</b>	4 Hrs	<p><b><u>Lecture</u></b></p> <p><b>Chapter sixteen: Basic immunological techniques</b></p> <p>16.1.Precipitation Reactions</p> <p>16.2. Agglutination</p> <p>16.3.Complement fixation</p> <p>16.4. Labeled Immunoassays</p> <p>16.5. Flow Cytometry</p>	Ref No2&1
	6 Hrs.	<b>Independent study</b>	
	2 Hrs	<b>Assignment for reading</b>	
<b>Eight</b>	4 Hr.	<b><u>Lecture</u></b>	Ref

		<b>Chapter seventeen: Tolerance and Autoimmunity</b> <b>Chapter eighteen: Hypersensitivity reactions (Types I, II, III, IV).</b>	No 2&1
	6 Hrs.	<b>Assessment</b> Group presentation	
	2 Hrs.	<b>Independent study</b>	
<b>Nine</b>	4 Hrs.	<b><u>Lecture</u></b> <b>Chapter nineteen: Immune deficiencies</b> 19.1.Primary immune deficiencies 19.2.Secondary immune deficiencies. <b>Chapter Twenty: MHC: genetics and role in transplantation.</b>	Ref No 1
	1 Hrs.	<b>Assessment</b> • Test three	
	5 Hrs.	<b>Independent study</b>	
	2 Hrs	<b>Assignment for reading</b>	
<b>Ten</b>	5 Hrs.	<b><u>Lecture</u></b> <b>Chapter twenty-two: Tumor Immunology.</b> <b>Chapter twenty -three Immunization.</b> <b>Chapter twenty-four: Assessment of immune component</b> 22.1. assessment of T-cells 22.2. assessment B-cells 22.3.assessment Phagocytic function 22.4. assessment complement	Ref No 1&2
	4 Hrs.	<b>Independent study</b>	
	2Hrs.	<b>Assignment for reading</b>	
<b>Eleven</b>	6 Hrs.	<b>Tutorial</b>	
	6 Hrs.	<b>Independent study</b>	
<b>Twelve</b>	1 Hrs.	<b>Independent study</b>	
	3 Hrs.	<b>Assessment</b> Final written examination	
<b>Teaching and Learning Methods</b>			

- Lecture/ Classroom contact
- Brainstorming
- Presentation and group discussion
- Audiovisual and Tutorial
- Computer assisted instruction( animation )

<b>Assessment</b> <ul style="list-style-type: none"> <li>• Assessment in this course will be based on written assignments (15%) group presentation (5%), three continuous tests (30%) and Final exam (50%)</li> </ul>	<b>Type and Weight (Percentage)</b> <b>Continuous assessment</b> <b>Two individual writing assignments 15%</b> <b>Assignment 1 (7.5%)</b> <b>Assignment 2 (7.5%)</b> <b>Group presentation (5%)</b>	<b>Competence to be assessed</b> <ul style="list-style-type: none"> <li>• Define immune system</li> <li>• List Components of the immune system</li> <li>• Compare Innate and adaptive immune responses</li> <li>• Explain Physiology of key lymphoid organs</li> <li>• Describe Antibodies and Antigens</li> <li>• Discuss Antigen Processing presentation to T-lymphocytes</li> <li>• Explain Maturation, Activation, Regulation of Lymphocytes</li> <li>• Explain Effectors Mechanisms of Immune Responses</li> <li>• Explain Immunity in Health and Disease</li> <li>• Describe principles and techniques of vaccination</li> <li>• Explain the type of Hypersensitivity reactions</li> <li>• List the Immune deficiency diseases</li> <li>• Explain immunological Tolerance</li> <li>• Describe the Autoimmunity diseases</li> <li>• Describe basic principles and immunological techniques</li> </ul>
	<b>Three Tests (30%)</b> Test 1    10%    Day 2 Test 2    10 %    Day 5 Test 3    10%    Day 8 <b>Final exam (50%) Day 13</b>	

		<ul style="list-style-type: none"> <li>• Describe the methods of Assessment for immune component</li> <li>• Describe the application of vaccination</li> </ul>
Course Policy	Refer in this curriculum.(page ).	
Reference (s)	<p><b>Required texts:</b></p> <ol style="list-style-type: none"> <li>1. <b>Roitt . M.I and Delves. J. Peter.</b> Immunology, 10<sup>th</sup> ed. Blackwell Scientific Publications.2001.</li> <li>2. <b>Male, <i>et al.</i></b> <u>Immunology</u>, 7<sup>th</sup> ed., MOSBY Elsevier, 2006.</li> <li>3. <b>Kuby,</b> Immunology 6th edition The Immune system in Health and Disease, ed. Garland Pub. Inc</li> </ol> <p><b>Recommended study books</b></p> <ol style="list-style-type: none"> <li>4. <b>Parslow</b> et al., Medical Immunology, 10<sup>th</sup>, Lange Medical Pub. California 2001.</li> <li>5. <b>Doan T . <i>et al.</i></b>, Immunology, Lippincotts Illustrated Reviews Immunology 1<sup>st</sup> Edition.2008.</li> <li>6. <b>Stevens C D.,</b> Clinical Immunology and Serology, a laboratory perspective 3<sup>rd</sup> ed, F.A. Davis Company, Philadelphia,2010 Robert F. Weaver. Molecular biology.</li> </ol>	
Approval Section	<p>Name of Module Coordinator/Course team leader: _____</p> <p>Signature _____ Date:_____</p> <p>Name of School/Department head _____</p> <p>Signature _____ Date:_____</p>	