

**UNIVERSITY OF NAIROBI**  
**SCHOOL OF BIOLOGICAL SCIENCES**  
**SZL 204: BASIC IMMUNOLOGY**

**LECTURE OUTLINE**

<b>WEEK</b>	<b>COURSE OUTLINE</b>	<b>PRACTICAL</b>
1	<p><b>Introduction to Immunology and the Immune system</b></p> <ul style="list-style-type: none"> <li>- Overview and the basis of immunology,</li> <li>- Principles of innate immunity as a frontline of host defence</li> <li>- Cell types of Innate immunity</li> <li>- Principles of Adaptive immunity</li> <li>- Lymphocytes and Antigen presenting cells</li> <li>- Humoral immune response and cell mediated immune response</li> <li>- Innate and acquired immunity</li> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>• Animal Handling bleeding and preparation, fixing and staining of blood smears</li> </ul>
2	<p><b>Anatomy of the immune system</b></p> <ul style="list-style-type: none"> <li>- Cells of the immune system</li> <li>- Cell cooperation in immune response</li> <li>- Organs of the immune system</li> <li>- Functions of the immune system</li> <li>-</li> </ul>	
3	<p><b>The Complement system</b></p> <ul style="list-style-type: none"> <li>- Complement activation and regulation</li> <li>- Complement pathways</li> <li>- Consequences of complement activation</li> <li>- Complement fixation tests</li> </ul>	<ul style="list-style-type: none"> <li>• Complement</li> </ul>

4	<b>Antigens</b> <ul style="list-style-type: none"> <li>- Requirements for immunogenicity</li> <li>- Contribution of biological system to immunogenicity</li> <li>- Immune response to antigens</li> </ul>	<ul style="list-style-type: none"> <li>• Examination of blood smears /</li> </ul>
5	<b>Immunoglobulins</b> <ul style="list-style-type: none"> <li>- Structure, classes and functions of immunoglobulin</li> <li>- Antigenic determinants and production of immunoglobulin</li> <li>- Antibody diversity and immunoglobulin gene structure</li> </ul>	<ul style="list-style-type: none"> <li>• Bleeding and preparation of serum</li> </ul>
6	<b>Cell mediated immunity: Generation, activation and differentiation of lymphocytes</b> <ul style="list-style-type: none"> <li>- T-cell maturation, activation and differentiation, memory T-cells</li> <li>- B-cell generation activation and differentiation, humoral response</li> <li>- Antigen presentation and recognition by B-cell and T-cell receptors</li> <li>- role of CD4 in infection and intracellular killing</li> </ul>	<ul style="list-style-type: none"> <li>• Cells and Organs of the immune system</li> </ul>
7	<b>Antigen – Antibody Interactions</b> <ul style="list-style-type: none"> <li>- Antigen –Antibody complexes</li> <li>- Biological consequences of Antigen –Antibody interactions</li> <li>- Tests for antigen – antibody interactions; precipitin reactions, Immuno-electrophoresis, Agglutination reactions, Radioimmuno Assays, ELISA</li> </ul>	<ul style="list-style-type: none"> <li>• Antigen-Antibody interaction in gels</li> </ul>
8	<b>Vaccines</b> <ul style="list-style-type: none"> <li>- Principles of Immunisation</li> <li>- Passive and active immunisation</li> <li>- Types of vaccines,</li> <li>- Routes of vaccine administration</li> <li>- Vaccine design</li> <li>Vaccine Schedule and vaccine failure</li> </ul>	<ul style="list-style-type: none"> <li>• Routes of vaccine inoculations and vaccine administration</li> </ul>

<p><b>9</b></p>	<p>Cytokines</p> <ul style="list-style-type: none"> <li>- Properties of cytokines</li> <li>- Cytokine receptors</li> <li>- Functions of cytokines</li> <li>- Cytokine antagonists</li> </ul>	
<p><b>10</b></p>	<p><b>Major Histo-compatibility complex (MHC)</b></p> <ul style="list-style-type: none"> <li>- Structure of MHC Molecules</li> <li>- Genomic organisation</li> <li>- Class I, II and III MHC genes</li> <li>- MHC polymorphisms</li> <li>- MHC and role in transplantation (recognition of alloantigens)</li> </ul>	

**Reference text:**

1. Roitt's Essential Immunology Blackwell Scientific Publications 10<sup>th</sup> Ed. – Ivan Roitt
2. Immunobiology – The Immune system in Health and Disease 6<sup>th</sup> Ed. Janeway, Travers, Walport, Shlomchik
3. Immunology AK Chentai., 3<sup>rd</sup> Ed. (The Jomo Kenyatta Foundation, (Available at Arziki bookshop @ Kes 539)
4. A text book of Immunology and Immunotechnology – B. Annadurai (Available at Arziki bookshop @ Kes 360)
5. Text book of Immunology by S. F. Basir
6. Kuby Immunology Richard A. Goldsby, Thomas J. Kindt, Barbara A. Osborne, Janis Kuby,
7. Understanding Immunology, Peter Wood