

**COLLEGE OF SCIENCE**  
**DEPARTMENT OF BIOLOGY**

Department	Biology
Module number	08
Module title	Biomedical Sciences
Module code	Biol-M3081
Course title	Introduction to immunology
Course code	Biol.3083
Course credit point	5ECTS
Credit hour	2
Pre-requisite	None
Instructor's name	Mihret Tenagne (M.S.c)
Instructor's contact information	0927544730
Office:	Academic year: 2019/2020
Phone: 09-27544730	Semester: II
Email : mihrettenagne@gmail.com	Class schedule : TBA
Target group: 3 <sup>rd</sup> year Biology	Meeting location: CR- 6227 or CR- 6228

### **1. Course description**

Humans and other animals live in an environment of pathogenic organisms as well as abiotic

molecules that triggers the immune system to respond. Thus, the course is organized in such a way that by describing how pathogenic organisms are stimulating the innate and adaptive immune system and how a cascade of immune response takes place in humans.

This is an introductory course of immunology. It is intended for students in the field of Biological science. The course deals with the basic knowledge on the role of innate and adaptive immunity in protecting the body against different infections, with specific emphasis on humoral and cellular immunity. The course gives due attention to cells involved in defense against foreign invaders. Besides, the course tries to give brief explanation on auto-immunity, inflammation, tissue grafting, allergy, complement system, immunodeficiency, and immune evasion mechanism.

## 2. Course Objectives

At the end of this course the student should be able to:

- ✓ Explain innate and adaptive immunity
- ✓ Discuss the role of innate immunity in protecting the body against infection
- ✓ Evaluate the role of adaptive immunity in protecting the body against infection
- ✓ Identify the role of cells in protecting the body against infection
- ✓ Explain the protective mechanism of the immune system
- ✓ Understand the applications of immunology in diagnosis, immunotherapy and vaccine

### Tentative Course Schedule

Week	Topic	
1	1. Introduction 1.1 Basic concepts in immunology	

	1.2 Components of the immune system 1.3 Principles of innate and adaptive immunity	
2	1.4 Cells and organs of the immune system 1.5 Hematopoiesis; Lymphocytes; Primary and secondary lymphoid organs	
3	2. Innate immunity 2.1 Different lines and layers of defense 2.2 Pattern recognition in innate immune system 2.3 The complement system; induced innate responses to infections	
4	2.4 Determinants of innate immunity 2.5 Protective action of innate immunity 2.5.1 Physiological and chemical barriers 2.5.2 Normal bacterial flora 2.5.3 Cellular defense	
5	3. Response of the innate immune response 3.1 Phagocytosis 3.2 Inflammation	
6	3.3 Complement 3.3.1 Classical pathway 3.3.2 Alternative pathway 3.3.3 Membrane attack complex	
7	4. Adaptive immunity 4.1 The lymphoid system	

	4.1.1 B lymphocytes and humoral immunity	
8	4.1.2 Antigen and antibody recognition 4.1.3 Antibody structure 4. 1.4 Classes of immunoglobulin	
9	4.2 T – lymphocytes 4.2.1 Cytokines and their role in CMI	
10	5. Adverse immune reactions 5.1 Type I hypersensitivity – allergic reactions 5.2 Type II hypersensitivity – autoimmune reactions 5.3 Type III hypersensitivity – immune complexes 5.4 Type IV hypersensitivity – delayed type	
11	6. applications of immunology 6.1 Diagnosis 6.2 Vaccines and immunotherapy	
12	Practical activities Hematology (RBC, WBC, blood grouping)	
13	Immunodiagnosis	

Assessment	Mark
Assessment 1	15 %
Assessment 2	15%
Assessment 3	15%
Lab report	5%
Final examination	50%
<b>Total 100 %</b>	

## References