Course Specification
(Bachelor)

Course Title:	Immunology
Course Code:	BIO 1212
Program:	Bachelor of Science in Biology
Department:	Biology
College:	Science
Institution:	Imam Mohammad Ibn Saud Islamic University
Version:	1
Last Revision Date:	17 sptember 2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: 3 (2 lectures + 2 laboratories)

2. Course type

A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		

3. Level/year at which this course is offered: (4/2)

4. Course general Description:

Introduces the principles knowledge of the immune system at both the molecular and cellular levels. Specifically, it aims to familiarize students with the components of the human immune system and the mechanisms involved in recognizing and eliminating pathogens. The course also focuses on innate and adaptive immunity, signaling molecules and the complement system. Additionally, immunological disorders including the immune system's role in allergic reactions, autoimmune, as well as immunodifiency also emphasized to enable the students to get acquainted. The lectures are complemented by laboratory that integrate widely used immunology tools.

5. Pre-requirements for this course (if any)**:**

BIO 1113

6. Co-requisites for this course (if any)**:**

None

7. Course Main Objective(s):

The objective of this course is to facilitate an understanding of preliminary knowledge of the immune system in humans and other mammals. On successfully completing this course, students will be expected:

• To familiarize with basic concepts in immunology. • To introduce the most important theories in immunology. • To introduce the different types of failures of the immune system. • To present the difference between innate and adaptive immune responses. • To introduce the basic concepts in t cell education, survival, and maturation. • To familiarize the students with the different types of immunoglobulins and their functions.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	100 %
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	24
2.	**Laboratory/Studio**	24
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		48

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Identify the components of the immune system and their role in immunity.	1.1	Lecture and take-home research assignment	Quizzes, midterm exam and final exam
1.2	Outline the difference between innate and adaptive immunity. Cell vs humoral mediated immune response.	1.1-1.2	Lecture and take-home research assignment	Quizzes, midterm exam and final exam
1.3	Recognize the types and structure of both antigens and antibodies.	1.1-1.3	Lecture and take-home research assignment	Quizzes, midterm exam and final exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.4	Describe the immunological issue in the context of allergy, autoimmune, immunodifiency diseases.	1.1-1.4	Lecture and take-home research assignment	Quizzes, midterm exam and final exam
2.0	**Skills**			
2.1	Explain how T-cells aid in eliminating pathogens from the body.	**2.1**	Laboratory and take-home research assignment	Lab reports and Lab exam
2.2	Write the role of B-cells and T-cells in the specific immune system.	**2.1-2.2**	Laboratory and take-home research assignment	Lab reports and Lab exam
2.3	Interpret the mechanisms that lead to the removal of pathogens, such as opsonization, complement activation, and other relevant processes.	**2.1-2.3**	Laboratory and take-home research assignment	Lab reports and Lab exam
3.0	**Values, autonomy, and responsibility**			
3.1	Demonstrate proper immunological laboratory techniques involving microscopy, biochemical.	**3.1**	Lecture, laboratory and take-home research assignment	Quizzes, midterm exam, Lab reports, project presentations, Lab exam and final exam
3.2	Illustrate the ability to communicate their ideas with the instructor at all times during and after the class.	**3.1-3.2**	Lecture, laboratory and take-home research assignment	Quizzes, midterm exam, Lab reports, project presentations, Lab exam and final exam
3.3	Use safety measures and operate laboratory instruments during laboratory sessions.	**3.3**	Lecture, laboratory and take-home research assignment	Quizzes, midterm exam, Lab reports,

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
				project presentations, Lab exam and final exam

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction: Basic concepts and Definitions	2
2.	The Immune system: Organs, cells	2
3.	The Immune system: Organs, cells Cont.	2
4.	The Immune system: Molecules	2
5.	Antigens	2
6.	Antibodies	2
7.	Immune response	2
8.	Microbial Immune Response	2
9.	Hypersensitivity Reactions	2
10.	Autoimmunity and Transplantation	2
11.	Immunodeficiency	2
12.	Cancer immunology	2
Total		24

No	List of Topics (Labs)	Contact Hours
1	Histological study for lymph system (thymus gland, lymph nodes, spleen, tonsils)	2
2.	Cell count with hemocytometer	2
3.	Preparation of the blood smear	2
4.	Serology (agglutination).	2
5.	Precipitation test immunodiffusion test	2
6.	Principles of ELISA	2
7.	Principles of ELISA II	2
8.	Fluorescent antibody staining, fluorescent microscopy	2
9.	Allergy (type one and type two) allergy test	2
10.	Flow cytometer	2
11.	Western Blot	2
12.	General revision	2
Total		24

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm 1 Around 4th - 5th week 15%	Midterm 1 Around 4th - 5th week	15%
2.	Midterm 2 Around 7th - 8th week 15%	Midterm 2 Around 7th - 8th week	15%
3.	Quizzes, Participation, and Attendance During the semester 10%	Quizzes, Participation, and Attendance During the semester	10%
4.	Lab reports During the semester 5%	Lab reports During the semester	5%
5.	Lab Exam Around 9th week 15%	Lab Exam Around 9th week	15%
6.	Final Exam Around 13th week 40%	Final Exam Around 13th week	40%
Total			**100%**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Judith A Owen; Janis Kuby; Jenni Punt; Sharon A Stranford Pat Jones, Kuby Immunology 8th ed, (2018), ISBN-13: 978-1429219198. The Immune System (TIS), 3rd edition, Peter Parham (2005), ISBN 978-0-8153-4146-8.
Supportive References	Murphy, K. M., and Weaver, C. (2016) Janeway's Immunobiology, 9th Edition, W. W. Norton & Company, ISBN 978-0815345053.
Electronic Materials	None
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and Laboratories
Technology equipment (Projector, smart board, software)	Projector and Smart board
Other equipment (Depending on the nature of the specialty)	Immunology-related instruments, including safety cabinet, ELISA plate reader, Hemocytometer, Fluorescence microscopes, Flow cytometry

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students Direct	Students Direct
Effectiveness of Students assessment	Program Leaders Direct	Program Leaders Direct
Quality of learning resources	Peer Reviewer Indirect	Peer Reviewer Indirect
The extent to which CLOs have been achieved	Program Leaders Direct	Program Leaders Direct
Other	-	-

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	