

**Course Title: IMMUNOGENETICS****Course Code: 2307618-3 Bio**

<b>Date:</b> 20 – 6 -1440	<b>Institution:</b> Umm Al-Qura University
<b>College:</b> Al-Jumum University College	<b>Department:</b> Biology

**A. Course Identification and General Information**

1. Course title and code: <b>Immunogenetics / Code:2307618-3 Bio</b>				
2. Credit hours: 42 hrs.				
3. Program(s) in which the course is offered: MSc. Genetics (If general elective available in many programs indicate this rather than list programs)				
4. Name of faculty member responsible for the course: <b>Al-Jumum University College</b>				
5. Level/year at which this course is offered: <b>Elective in Level1or2/year1</b>				
6. Pre-requisites for this course (if any): N/A				
7. Co-requisites for this course (if any): N/A				
8. Location if not on main campus: Building (B) in Al-Jumum College				
<b>9. Mode of Instruction (mark all that apply):</b>				
a. Traditional classroom	√	percentage	<b>50%</b>	
b. Blended (traditional and online)	√	percentage	<b>20%</b>	
c. E-learning	√	percentage	<b>20%</b>	
d. Correspondence		percentage	<b>%0</b>	
f. Other: Inverted Classroom and Integrated education	√	percentage	<b>10%</b>	
Comments:				

**B. Objectives****1. The main objective of this course****After completing this course, students will learn:**

- understanding of basic aspects of the structure and functions of the immune system
- Define the genetic systems that encode molecules with integral roles in immune regulation
- understand the cellular and molecular interaction of the immune responses.
- Assess the impact of allelic polymorphism in certain genes on features such as gene expression and MHC restriction
- Define the basic mechanisms for expansion of the immunologic repertoire of antigen receptors
- Understand the implications of population differences in the frequencies of genes involved in immune responses

Describe briefly any plans for developing and improving the course that are being implemented. (e.g. increased use of the IT or online reference material, changes in content as a result of new research in the field)

- **Regular Updating the content of the course according to the new publications and research in the field**
- **Feedback of outcome for this course**
- **Build in more active learning into class**

**C. Course Description** (Note: General description in the form used in the program's bulletin or handbook)**Course Description:**

In the first section of this modules, the current understanding of the cellular and molecular interactions in the inductions, expression, and regulation of the cellular and humoral immune responses. Also, this course will present the genetic basis of immune responsiveness. Reviews the genetic mechanisms responsible for generation of diversity in the genes for immunoglobulins, the T cell receptor molecules, the major

histocompatibility molecules, and other key molecules of the immuno-globulin superfamily. Discusses mechanisms and statistical evaluation of immunogenetic associations with susceptibility or resistance to disease.

### 1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
<b>Introduction</b> <ul style="list-style-type: none"> <li>Principle concept of immunology</li> <li>Humoral immune response</li> <li>Immunoglobulins</li> <li>Antigen-antibody interaction</li> </ul>	1	3
<b>Immunogenetics and immunogenomics:</b> <ul style="list-style-type: none"> <li>Immunogenetics definition</li> <li>Immunological tolerance and memory</li> </ul>	1	3
<b>Overview of Immunogenetics:</b> <ul style="list-style-type: none"> <li>Structure,</li> <li>Organization,</li> <li>Polymorphism,</li> <li>Evolution</li> <li>Selection</li> <li>Associations with disease.</li> </ul>	2	6
<b>Genetic control of immune responses.</b>	1	3
<b>Genetics of transplantation</b>	1	3
Molecules at the host and pathogen inter-phase and their genes.	2	6
<b>Genetics of antigen presentation</b>	1	3
<b>Immunogenomic and its analysis.</b>	1	3
Immunogenetics of vaccination.	1	3
Immunogenetics of tumors.	1	3
Immunogenetics of reproduction.	1	3
Applications of Immunogenetics techniques	1	3
<b>Number of Weeks /and Units Per Semester</b>	14	42

### 2. Course components (total contact and credit hours per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other	Total
<b>Contact Hours</b>	<b>Planned</b>	14	7	7	14	-	42
	<b>Actual</b>						
<b>Credit</b>	<b>Planned</b>	14	7	7	14	-	42
	<b>Actual</b>						

### 2. Individual study/learning hours expected for students per week.

- Additionally, Office hours for faculty member

4

### 4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategies

**On the table below are the five NQF Learning Domains, numbered in the left column. First, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). Second, insert supporting teaching strategies that fit and align with the assessment methods and targeted learning outcomes. Third, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy should fit in together with the rest to form an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)**

<b>Curriculum Map</b>			
<b>Code</b>	<b>NQF Learning Domains And Course Learning Outcomes</b>	<b>Course Teaching Strategies</b>	<b>Course Assessment Methods</b>
1.0	<b>Knowledge</b>		
1.1	Understanding Basis of inheritance	1. Lectures with the help of data show and power point slide show. 2. Discussions and Class activities. 3. Microscopical demonstration of slides. 4. Practical training 5. Internet data collection. 6. Seminars 7. Inverted class rooms 8. E-Learning	(1). Announced Quizzes (2). Activities will include laboratory reports, homework, and movie quizzes. (3) Tests will be of multiple formats, including multiple-choice, fill-in-the-blanks, short answers, and problem solving. (4)- Papers based essays (5) Oral exam consisting of a presentation of one of topics taught
1.2	Understanding Different mechanisms of chromosomal aberrations and its reflection on phenotype of Individual.		
1.3	Understanding characteristics of genetic material and different methods of its manipulation and applications.		
2.0	<b>Cognitive Skills</b>		
2.1	Standup thinking to find out a relationship between different immune responses and their Genetic control	1. Lectures with the help of data show and power point slide show. 2. Discussions and Class activities. 3. Microscopical demonstration of slides. 4. Practical training 5. Internet data collection. 6. Seminars 7. Inverted class rooms 8. E-Learning	(1) .Announced Quizzes (2). Activities will include laboratory reports, homework, and movie quizzes. (3) Tests will be of multiple formats, including multiple-choice, fill-in-the-blanks, short answers, and problem solving. (4)- Papers based essays (5) Oral exam consisting of a presentation of one of topics taught
2.2	Learn the Relationship between the genetic material, diseases, immunity and the control of these diseases.		
2.3	Recognize Characteristics of Immunogenetics of vaccination, teamers and reproduction		

3.0	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	Recognition and Detection of similarities and differences between different species based on DNA polymorphism.	1.Lectures with the help of data show and power point slide show.	(1) .Announced Quizzes (2).Activities will include laboratory reports, homework, and movie quizzes.
3.2	Ability to diagnose phenotypic malformation and sterility problems associated with Immunogenetic disorders	2. Discussions and Class activities. 3. Microscopical demonstration of slides. 4 .Practical training 5. Internet data collection. 6. Seminars 7.Inverted class rooms 8.E-Learning	(3)Tests will be of multiple formats, including multiple-choice, fill-in-the-blanks, short answers, and problem solving. (4)- Papers based essays (5)Oral exam consisting of a presentation of one of topics taught
4.0	<b>Communication, Information Technology, Numerical</b>		
4.1	Experience in immunogenetic procedures for different species by using different materials (blood, bone, marrow, etc).	1.Lectures with the help of data show and power point slide show. 2. Discussions and Class activities.	(1) .Announced Quizzes (2).Activities will include laboratory reports, homework, and movie quizzes.
4.2	Isolation of DNA from different organs.	3. Microscopical demonstration of slides.	(3)Tests will be of multiple formats, including multiple-choice, fill-in-the-blanks, short answers, and problem solving.
4.3	Internet Searching.	4 .Practical training 5. Internet data collection. 6. Seminars 7.Inverted class rooms 8.E-Learning	(4)- Papers based essays (5)Oral exam consisting of a presentation of one of topics taught
5.0	<b>Psychomotor</b>		
5.1	Carrying out practical experiments in field and laboratory	<ul style="list-style-type: none"> <li>• Lectures with the help of data show and power point slide show.</li> <li>• Discussions and Class activities.</li> <li>• Microscopical demonstration of slides.</li> <li>• Practical training</li> <li>• Seminars</li> <li>• Inverted class rooms</li> </ul>	<ul style="list-style-type: none"> <li>• Announced Quizzes</li> <li>• Activities will include laboratory reports, homework, and movie quizzes.</li> <li>• Oral exam consisting of a presentation of one of topics taught</li> </ul>

5.2	Awareness of laboratory safety issues and experimental ethics	Attendance and participating in all practical research project Supervising students throughout the lab experiments 3. Microscopical demonstration of slides.	Announced Quizzes Activities will include laboratory reports, homework, and movie quizzes. Tests will be of multiple formats, including multiple-choice, fill-in-the-blanks, short answers, and problem solving. Papers based essays Oral exam consisting of a presentation of one of topics taught
-----	---------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

#### 5. Assessment Task Schedule for Students During the Semester

	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Exercises & Assignments	All Weeks	5%
2	Project (single\group)	--	3%
3	Participation	All Weeks	2%
4	Quiz (1)	5 <sup>th</sup> Week	10%
5	Written Exam (1)	8 <sup>th</sup> Week	20
6	Quiz (2)	13 <sup>th</sup> Week	10%
7	Final Exam	16 <sup>th</sup> Week	50%

#### D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic counseling. (include the time teaching staff are expected to be available per week)

**The Head of the Department arrange the student consultations and academic counseling by distributing the students on the teaching staff to guide them in the Office hours.**

#### E Learning Resources

1. List Required Textbooks	<b>Textbook 1:</b> Immunogenomics and Human Disease by Andras Falus (Editor), <b>2006</b> , Wiley. <b>Textbook 2:</b> Immunogenetics: Advances and Education: The First Congress of the Slovak Foundation by J a Madrigal (Editor), Tibor Nanasi, Margita Bencova (Editor), <b>2013</b> , Springer
2. Essential References	<b>Textbook 1:</b> Immunogenetics: Methods and Applications in Clinical Practice, by Frank T Christiansen (Editor), Brian D Tait (Editor), <b>2012</b> , Humana Press Inc.
3-Recommended Books and Reference Material	<b>Textbook 1:</b> Immunogenetics of Autoimmune Disease by Jorge R Oksenberg (Editor), David Brassat (Editor), <b>2014</b> , Springer
3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.	<b>Website 1:</b> <a href="http://www.ncbi.nlm.nih.gov/guide/Journals/">http://www.ncbi.nlm.nih.gov/guide/Journals/</a>

	<b>Website 2:</b> Biotechnology. Publisher: the Asian Network for Scientific Information. Start Year: <b>2002</b> <b>Website 3:</b> <a href="http://www.ansinet.org/c4p.php?j_id=biotech">http://www.ansinet.org/c4p.php?j_id=biotech</a> <b>Website 4:</b> Genetics & Molecular Biology. Publisher: Brazilian Society for Genetics.
4. Other learning material	<b>Online labs:</b> Arlene Locke International Cell Exchange UCLA Immunogenetics Center Department of Pathology & Laboratory Medicine

### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)
2. Technology resources (AV, data show, Smart Board, software, etc.)
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

### G Course Evaluation and Improvement Procedures

1. Strategies for Obtaining Student's Feedback on Effectiveness of Teaching <ul style="list-style-type: none"> <li>- <b>Student activities.</b></li> <li>- <b>Student discussions.</b></li> <li>- <b>Student proposals.</b></li> <li>- <b>Student assessment</b></li> </ul>
2. Other Strategies for Evaluation of Teaching by the Instructor or the Department <ul style="list-style-type: none"> <li>- <b>Regular exams and quiz</b></li> <li>- <b>Work questionnaires</b></li> <li>- <b>Student interview</b></li> </ul>
2. Procedures for Teaching Development <ul style="list-style-type: none"> <li>- <b>Continuous updating with the use of all new mechanisms in the field</b></li> <li>- <b>Staff members are required to attend training courses, conferences and workshops to improve their learning skills</b></li> <li>- <b>communication with faculty members in other colleges to share experiences</b></li> </ul>
3. Procedures for Verifying Standards of Student's Achievement (e.g. check marking by an independent member teaching staff of a sample of student's work, periodic exchange and remarking of tests or a sample of assignments with staff members at another institution) <ul style="list-style-type: none"> <li>- <b>Comparison of lectures and tests.</b></li> <li>- <b>Random review of tests</b></li> </ul>
4. Describe the planning arrangements for periodically reviewing course effectiveness and planning for developing it. <ul style="list-style-type: none"> <li>- <b>An advisory committee is formed to improve and develop the program's courses</b></li> <li>- <b>Adding or removing a subject from a course after approval by the department council</b></li> <li>- <b>The university book must be approved by the department council</b></li> </ul>

Name of Course Instructor: **Staff from KAU**

Signature: \_\_\_\_\_ Date Completed: \_\_\_\_\_

Program Coordinator: **Dr. Sameer Qari**

Signature: \_\_\_\_\_ Date Received: \_\_\_\_\_