Gene regulation and epigenetics; Code: PM E07

A- Basic Information

Programme(s) on which the course is given:	Bachelor of Pharmacy (Pharm D)
Department responsible for offering the course:	Microbiology and Immunology
Department responsible for teaching the course:	Microbiology and Immunology
Academic year:	Level four- semester 7- (2022-2023)- elective
Course title and code:	Gene regulation and epigenetics, PM E07
Prerequisite:	Registration
Credit hours:	Lectures: 2, Practical: 0, Total: 2
Course Coordinator:	

B- Professional Information

1 - Overall Aim of the Course

This course will give an introduction to the fundamentals of epigenetic control. It will examine epigenetic phenomena that are manifestations of epigenetic control in several organisms and the interplay between epigenetic control and the environment. The course will emphasise how epigenetic regulates gene expression and heritable phenotypes without changes in the underlying DNA sequence

2 - Course learning outcomes

Domain 1: Fundamental knowledge

The students should be able to:

Program key elements	Course learning outcomes
1.1.1.8. Explain basics of bioinformatics, biotechnology, and epigenetics.	1.1.1.8. Explain the fundamental of epigenetics. 1.1.1.8.a. Illustrate the knowledge of epigenetics 1.1.1.8.b. Understand how it regulates gene expression and heritable phenotypes without changes in the underlying DNA sequence.
1.1.2.4. Utilize medical, pharmacological & statistical terms in pharmacy practice for effective scientific communication.	1.1.2.4. Understand the epigenetic basis of numerous developmental abnormalities, the natural ageing process, environmental exposures, and pertinent human diseases such as cancer, obesity, neurological disorders, and infections by using the right pharmaceutical and medical terminology, abbreviations, and symbols.

Domain 3: Pharmaceutical care

The students should be able to:

Program key elements	Course learning outcomes
3.1.1. Integrate the basis of body physiology and genomics in health and disease states for various disorders management.	3.1.1.a. Follow the principles of body function 3.1.1.b. Understand the foundations of genomics in health and disease states to manage various diseases.

3- Course Contents

Week	Lectures	
	Topic	Credit hrs. (2)
1	Introduction to Epigenetics and the nucleosome as the basic unit of chromatin	2
2	DNA modifications (part 1)	2
3	DNA modifications (part 2)	2
4	Histone modifications (part 1)	2
5	Histone modifications (part 2)	2
6	**Midterm**	
7	Non-coding RNAs (part 1)	2
8	Non-coding RNAs (part 2)	2
9	Epitranscriptomics: RNA modifications	2
10	Chromatin remodelling	2
11	Histone variants	2
12	Prions	2
13		
14	**Written exam**	

4- Teaching and Learning Methods:

- Lectures (Tools: board, overhead projector, data show).
- Tutorials in labs for the theoretical parts.
- E-learning and class Activities

5- Student Assessment Methods:

Written Midterm exam	To assess	The ability of students to follow-up the course subjects.
Written final exam	To assess	The overall outcomes.

Assessment Schedule

Assessment 1	Periodic exam	Week 6
Assessment 2	Final written exam	Week 14

Weighting of Assessments

Periodical examination	15%
Final-term Examination	85%
Oral Examination	--- %
Practical Examination	--- %
Other types of assessment	--- %
Total **100**	**%**

6- List of Reference

7- Facilities Required for Teaching and Learning

Modern libraries, audiovisual tools, chemicals, cooperative assistants, glassware and instruments

Course members:

Course Coordinator:

Head of Department: Prof. Dr. Khaled Anwar Aboshanab Khaled Aboshanab

Course name	Gene regulation and epigenetics
Code	PM E07

Course Plan & Matrices

Course Contents		Program Key Elements	Course learning outcomes	Teaching and Learning Methods	Student Assessment Methods
Week # 1	Introduction to Epigenetics and the nucleosome as the basic unit of chromatin	1.1.1.8 1.1.2.4	1.1.1.8.a 1.1.1.8.b 1.1.2.4	Lectures	Written
Week # 2	DNA modifications (part 1)	1.1.2.4	1.1.2.4	Lectures	Written
Week # 3	DNA modifications (part 2)	1.1.2.4	1.1.2.4	Lectures Open discussion brain storming Assignments,	Written
Week # 4	Histone modifications (part 1)	1.1.1.8 1.1.2.4	1.1.1.8.a 1.1.1.8.b 1.1.2.4	Lectures	Written
Week # 5	Histone modifications (part 2)	1.1.1.8 1.1.2.4	1.1.1.8.a 1.1.1.8.b 1.1.2.4	Lectures,	Written
Week # 6	**Midterm**				
Week # 7	Non-coding RNAs (part 1)	3.1.1	3.1.1.a 3.1.1.b	Lectures Assignments, Self-learning	Written
Week # 8	Non-coding RNAs (part 2)	3.1.1	3.1.1.a 3.1.1.b	Lectures	Written
Week # 9	Epitranscriptomics: RNA modifications	1.1.1.8 1.1.2.4	1.1.1.8.a 1.1.1.8.b 1.1.2.4	Lectures	Written
Week # 10	Chromatin remodeling	1.1.2.4 3.1.1	1.1.2.4 3.1.1.a 3.1.1.b	Lectures	Written
Week # 11	Histone variants	1.1.2.4 3.1.1	1.1.2.4 3.1.1.a 3.1.1.b	Lectures Assignments	Written
Week # 12	Prions	1.1.2.4	1.1.2.4	Open discussion brain storming Assignments	Written

تم الاعتماد فى (محضر مجلس قسم الميكربيولوجيا والمناعة)
جلسة رقم (13) بتاريخ 15 / 8 / 2021