Zarqa University
Faculty of Allied Medical Sciences
Department of Medical Analysis
Semester: ……
Year: ……

Course: Cancer Biology (0701418)
Credit Hours: 3
Prerequisite: General Biology (2)
Lecture's time: ……
Lecture room: ……

Instructor: ……
Office #: ……
Office phone: ……
E-mail: ……

Office Hours:
……
……
……

Course description:

This course covers the molecular, genetic and cellular mechanisms that lead to transfer normal cell into cancer cell. In particular, the growth signaling pathway, controlling of cell cycle, mutations and DNA damage, factors that cause cancer and programmed cell death will be explored in details. In addition, this course covers tumor angiogenesis, metastasis and invasion, and overview of cancer diagnosis and treatment. This course will also educate students how to search for a recently published research paper in a peer-reviewed journal and how to analyze a research paper.

Aims of the course:

The course aims to provide students with a broad understanding of the molecular basis of cancer and metastasis, together with identifying the causes of cancer and the main factors that cause cancer. In addition, the course aims to provide the students with overview of cancer diagnosis and treatment.

Intended Learning Outcomes: (ILOs)

A. Knowledge and Understanding

A1. Concepts and Theories:

Define principles of cancer biology
Describe human tumors, their classification and nomenclature
Describe the properties of cancer cell that characterized them from normal cell
Identify and describe factors that cause cancer and the mechanism how these factors cause cancer
Discuss the role of oncogenes and signaling pathways in carcinogenesis
Discuss the interactions of nuclear oncogenes and tumor suppressor genes in cell cycle control and apoptosis

A2. Contemporary Trends, Problems and Research:

Discuss the current state of scientific knowledge of the molecular basis of cancer
Describe recent research methods in understanding cancer, cancer diagnosis and treatment

A3. Professional Responsibility:

Apply the knowledge from this course while working in medical laboratory to diagnose cancer

B. Subject-specific skills

B1. Problem solving skills:

Ability to analyze and solve problems in cancer research

Describe scientific procedure for solving problems in identifying the causes of cancer through analyzing course example in cancer research and answer questions through the lecture

B2. Modeling and Design:

Know how to access information about cancer and medical research in general

Describe how to design scientific research through analyzing research paper and understanding the examples that will be presented during course

B3. Application of Methods and Tools:

Apply the knowledge to analyze research paper and present the paper to the class

Apply the knowledge in cancer diagnosis methods and research in the future while working in medical laboratory or postgraduate studies

C. Critical-Thinking Skills

C1. Analytic skills:

Ability to extract data and analyze data from scientific research paper related to cancer

Ability to analyze experiment examples in the course to understand how scientists discover cancer cells properties

C2. Strategic Thinking:

Be able to use and apply the data from epidemiological studies and scientific research with basic scientific knowledge to prepare future plans to decrease cancer risk

Ability to apply strategic thinking skills obtained from the course in other medical subjects and personal life

C3. Creative thinking and innovation:

Be familiar with processes and methods of creative problem solving: observation, definition, representation and evaluation

Enhance students' creative and innovative thinking skills through "brainstorm" questions and analyzing research experiments related to cancer

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Communication:

Begin to develop intellectual independence and foster a commitment to lifelong learning

Appreciate the need to communicate information and arguments effectively using written and oral skills

D2. Teamwork and Leadership:

Understand and demonstrate how to work as part of a team by working with a group to analyze and present a research paper related to cancer

Course structures:

Week	Topic #	Topics	Chapter	Teaching Procedure	Assessment methods
1	1	Introduction to cancer biology	1/other resources	Lecture, oral inquiry & charts	Class participation and discussion
2	2	Principles of genetics and molecular biology	Relevant references 1 and 2	Lecture, oral inquiry, figures & animation	Class participation, discussion & homework
3	3	What is cancer?	1	Lecture, oral inquiry & figures	Class participation, discussion & homework
4	4	Profile of a cancer cell	2	Lecture, oral inquiry & figures	Class participation, discussion & homework
5					
6	**First exam date: ……**				
	5	How cancer spread	3	Lecture, oral inquiry & figures	Class participation, discussion & homework
7	6	Identifying the causes of cancer	4	Lecture, oral inquiry & figures	Class participation, discussion & homework
8	7	Chemicals and cancer	5	Lecture, oral inquiry & figures	Class participation, discussion & homework
9	8	Radiation and cancer	6	Lecture, oral inquiry & figures	Class participation, discussion & homework
10	9	Infectious agents and cancer	8	Lecture, oral inquiry & figures	Class participation, discussion & homework
11	10	Oncogenes	9	Lecture, oral inquiry & figures	Class participation, discussion & homework
	Second exam date: ……				
12	11	Tumor suppressor genes	10	Lecture, oral inquiry & figures	Class participation, discussion & homework
13	12	Cancer screening, diagnosis, and treatment	11	Lecture, oral inquiry & figures	Class participation, discussion & homework
14	-	Student presentations	-	-	Oral presentation & discussion
15-16	**Final exams period, to be determined by the registration**				

References:

A. Main Textbook:

- ***Principles of Cancer Biology: Pearson New International Edition*** (1st edition, 2013) by Lewis J. Kleinsmith. *Published by Pearson Education Limited*.
  - ✓ This textbook is available in the university library's booking shelf
  - ✓ An alternative ebook versions from this text book is available on CourseSmart, for more details check the following website : http://catalogue.pearsoned.co.uk/educator/product/Principles-of-Cancer-Biology-Pearson-New-International-Edition-CourseSmart-eTextbook/9781292047867.page

B. Supplementary Textbook(s):

1. ***The biology of cancer*** (2nd edition, 2014) by Robert A. Weinberg. *Published by Garland Science*
2. ***Campbell Biology*** (any available edition) by Jane B. Reece et al. (relevant parts: THE CELL and GENETICS).
3. **Lecture handouts** (the lecture handouts for each topic will be available on moodle during the semester).
4. **Databases:** the university library provides a valuable source for research paper through many databases that the university subscribed to. You will use these databases to search for a relevant research paper in this course. All the information you need to use the university library databases will be presented during the semester.
5. **Internet resources:** there are many helpful resources related to cancer in the internet, students are encouraged to search in the internet for information related to the course topics.
6. Useful websites that facilitate learning process in this course will be posted on moodle during the semester.

Moodle:

- Moodle provides all the necessary information related to this course including: course syllabus, announcements related to the course, lecture handouts, etc.
- PLEASE MAKE SURE to check moodle for any update related to the course or to download lecture's handouts.

Assessment Methods:

Methods	Grade	Date
First exam	20 %	…… (to be confirmed by the faculty)
Second exam	20 %	…… (to be confirmed by the faculty)
Research paper presentation	6 %	During semester week 14
Attendance and participation	4 %	-
Final exam	50 %	To be determined by the registration