

BMS4301: CANCER BIOLOGY

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Cancer Biology

Subject Code

BMS - Biomedical Sciences

Course Number

4301

Academic Unit

Biomedical Sciences (BMS)

College/School

Jockey Club College of Veterinary Medicine and Life Sciences (VM)

Course Duration

One Semester

Credit Units

3

Level

B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

BMS2004 Biochemistry OR BMS2201 Molecular Biology of the Cell

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

Cancer has a profound impact on not only the individual, but also the entire society. A better understanding of the biology of cancer has led to improved detection and more effective treatments. This course will provide a comprehensive overview

of the molecular and cellular biology of cancer. We will explore the role of genetic mutations and altered cellular signalling mechanisms in cancer development. In addition, we will examine the deregulation of fundamental biological processes including cell proliferation, apoptosis and angiogenesis. The rationale for different treatment options and the advances in biomedical technologies for diagnosis and therapies will also be discussed.

Course Intended Learning Outcomes (CILOs)

CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe the nature of cancer, and features of cancer that lead to high mortality rates	x		
2	Explain various genetic mutations and altered signalling pathways which can result in cancer development		x	
3	Biological rationale for treating cancers with chemotherapies, targeted therapies, and immunotherapies		x	
4	Criticize the literature in cancer biology, extract relevant information and integrate new information with current knowledge		x	x
5	Advances in genomic and molecular technologies for improved diagnosis and treatment of cancers		x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	Teaching and learning based on lectures to explain the fundamental principles in cancer biology, molecular and cellular basis of cancer, as well as advances in biomedical technology for tumor diagnosis and treatment	1, 2, 3

2	Tutorial	Student will learn through small group discussion and presentation to enhance their knowledge in cancer biology	2, 3, 4, 5	
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Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Quiz	1, 2, 3	20
2	Presentation and assignments	2, 3, 4, 5	20

Continuous Assessment (%)

40

Examination (%)

60

Examination Duration (Hours)

2-3

Additional Information for ATs

Minimum Passing Requirement: A minimum of 40% in continuous assessment as well as in examination.

Assessment Rubrics (AR)**Assessment Task**

Examination

Criterion

To test students' application of material taught in class and in tutorial & practical sessions

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Presentation and assignment

Criterion

Challenges students to collaborate, communicate and work together to solve problems

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Quiz

Criterion

To test the understanding of the students in the course materials

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

- Oncogenes
- Tumor suppressor genes
- Signaling pathways in cancer
- Cell cycle clock
- Apoptosis
- Tumorigenesis
- Genomic integrity
- Angiogenesis
- Invasion and metastasis
- Chemotherapy

- Targeted therapy
- Immunotherapy for cancer

Reading List

Compulsory Readings

Title	
1	The Biology of Cancer, 2e ISBN: 978-0815342205

Additional Readings

Title	
1	Nil