

BMS4003B: CLINICAL BIOCHEMISTRY AND MOLECULAR DIAGNOSTICS

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Clinical Biochemistry and Molecular Diagnostics

Subject Code

BMS - Biomedical Sciences

Course Number

4003B

Academic Unit

Biomedical Sciences (BMS)

College/School

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

Course Duration

One Semester

Credit Units

2

Level

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

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

BMS2201 Molecular Biology of Cell

- The above-mentioned prerequisite is waived for BMS-major students who are admitted from advanced standing II entry, 2016 and 2017 FYFD intake students.

- For 2018 and thereafter FYFD intake students, they are required to meet the pre-requisite requirement.

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Additional Information

Note: BMS4003B does not contain any practical component, and has a credit unit value of 2.

Part II Course Details**Abstract**

The course will correlate the basic knowledge obtained in the previous modules and provides students with the fundamental concepts of biomolecule and will further enhance their students' knowledge in clinical biochemistry. A diverse range of biomolecules including lipids, polysaccharides, proteins, nucleic acids and metabolites will be studied. Protein structures and the biochemical logic of the metabolic pathways will also be discussed. For the lab sessions, students will be able to perform experiments using advanced Immunological techniques, such as fluorescence microscopy and advanced immunodiagnostic assay systems will also be performed. Students will learn how to apply the practical aspects of techniques used in a histopathology laboratory through the lab sessions. Furthermore, the course will include the recent trends of immunodiagnostics of human diseases through a range of case studies.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Identify the structures and functions of biomolecules and describe cellular production and manipulation of biomolecules		x		
2	Demonstrate a working knowledge on the use of bioinformatics tools and databases for protein and DNA analysis			x	
3	Evaluate the test results for genetic disorders by using recombinant DNA techniques in prenatal diagnosis and coronavirus infections.			x	x
4	Critically analyses scientific papers and journals		x	x	
5	Employ practical knowledge in operation of the Molecular Diagnostics Laboratory				x
6	Construct critical thinking skills in the immunology laboratory environment			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	Lectures deliver subject-specific knowledge	1, 2, 3, 4	

2	Tutorials and Lab sessions [wet-lab practicals for BMS4003 only.]	Demonstrate subject-specific skills in carrying out experimental work	1, 2, 3, 4, 5, 6	
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Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)	
1	Web-lab and dry-lab practical reports and group project	1, 2, 4	30	Wet-lab is not applicable for BMS4003B.
2	Term paper (Individual assignment)	1, 2, 3, 4	10	

Continuous Assessment (%)

40

Examination (%)

60

Examination Duration (Hours)

3

Additional Information for ATs

Minimum Passing Requirement:

- Continuous assessment: 40%; and

- Written examination: 40%.

Assessment Rubrics (AR)**Assessment Task**

1. Research project (Group project)

Criterion

Demonstrate the ability to explain the methodology and procedure

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

2. Term paper (Individual assignment)

Criterion

Practical reports are based on specific their knowledge and demonstrate subject-specific skills in carrying out experimental work and data analysis

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

3.Final Exam

Criterion

To test students' application of material taught in class and evaluate their performance based on their performance on the exam

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

- Lipids
- Polysaccharides
- Nucleic acids
- Protein structures
- Metabolic pathways
- Molecular biology of the gene

- DNA-protein interaction
- Patterns, Motifs and profiles analysis
- Sequence analysis
- Design and Operation of the Molecular Diagnostics Laboratory
- Enzyme-linked immunosorbent assays (ELISAs)

Reading List

Compulsory Readings

Title	
1	Burtis, C., Ashwood, E., & Burns, D. (2005). Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. ISBN: 978-1-4557-3412-2
2	http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3107405/

Additional Readings

Title	
1	Nil