BMS3003: ADVANCED CLINICAL CHEMISTRY

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Advanced Clinical Chemistry

Subject Code
BMS - Biomedical Sciences
Course Number
3003

Academic Unit
Biomedical Sciences (BMS)

College/School
College of Biomedicine (BD)

Course Duration
One Semester

Credit Units
3

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

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
BMS2003 Clinical Chemistry or equivalent

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract
The course aims to provide an advanced knowledge of the principles of clinical chemistry by illustrating the metabolism and function of hormones. Disorders of carbohydrates metabolism, electrolyte balance, blood gas assessment, parathyroid

hormone and calcium homeostatis, organ function test, therapeutic drug monitoring, drug abuse testing and the genetic basis of disease hypothalamic will also be investigated. The course will allow students to develop practical skills to carry out clinical studies in given clinical conditions.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Implement the procedures and methodologies in clinical chemistry for diagnosis and monitoring of human disease	25		x	
2	Carry out laboratory investigations by applying appropriate methodology and techniques, demonstrate ability in using equipment available in the laboratories	25	x	x	x
3	Evaluate and interpret the laboratory results in different clinical conditions, critically discuss the interpretation of the results and recommend changes based on recent practice	25	x	x	x
4	Develop an enduring set of clinical and research skills for use in their future laboratory work	25	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.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures and models	Teaching and learning based on a combination of lectures and models to explain the structure of the metabolism and function of hormones	1, 2, 3, 4	
2	Laboratory training	Develop the skills to apply what has been taught in lectures/tutorials into practice	1, 2, 3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Laboratory reports	2, 3, 4	20	-	Yes
2	Mid-term quizzes	1, 2, 3	10	The quiz could be other equivalent course work assigned by course leader	No

Continuous Assessment (%)

30

Examination (%)

70

Examination Duration (Hours)

3

Minimum Continuous Assessment Passing Requirement (%)

40

Minimum Examination Passing Requirement (%)

40

Additional Information for ATs

Practical Examination (duration: 3 hours): 30% Written Examination (duration: 3 hours): 40% Examination total: 70% Minimum Passing Requirement: - Continuous assessment: 40%; and - Written examination: 40%; and - Practical examination: 40%. Please note that attendance in all practical sessions is mandatory for the completion of the course. Practical sessions are an integral part of the curriculum, providing hands-on learning experiences and essential for medical laboratory science training. Failure to attend practical sessions (an unauthorized absence and/or lateness) may result in a deduction of marks or, in extreme cases, may lead to failure in the course.

Assessment Rubrics (AR)

Assessment Task

1. Coursework (Short quizzes, laboratory performance/reports)

Criterion

Short Quizzes: Quiz score will be used to verify the state of students' learning progressLab reports: 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

2. End-of-term examination

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

Assessment Task

3. End-of-term lab test

Criterion

To test students' skills of using laboratory instrument and evaluate their performance based on their performance on the lab test

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

- Laboratory Principles
- Analytical Techniques and Instrumentation

- Quality control and quality assurance
- Enzymology
- Electrolytes
- Blood gas analysis
- Liquid profile
- Molecular Diagnostics and Genetics
- Organ function test
- Therapeutic drug screening
- Pathophysiology

Reading List

Compulsory Readings

	Title
1	Clinical Chemistry: Principles, Techniques, and Correlations By Michael L. Bishop, Edward P. Fody, Larry E. Schoeff MS,

Additional Readings

	Title
1	Tietz Textbook of Clinical Chemistry and Molecular Diagnosticsby Carl A. Burtis , Edward R. Ashwood , David E. Bruns
2	Clinical Chemistry, Immunology and Laboratory Quality Controlby Amitava Dasgupta, and Amer Wahed, 2014, ISBN: 978-0-12-407821-5
3	Marks' Basic Medical Biochemistryby Michael A. Lieberman, Allan D. Marks, 2012, ISBN-13: 978-160831572
4	Journal of the American Association of Clinical Chemistryhttps://www.aacc.org/