# BMS2205: ESSENTIAL TECHNIQUES IN BIOMEDICAL SCIENCES

**Effective Term**
Semester A 2025/26

## Part I Course Overview

**Course Title**
Essential Techniques in Biomedical Sciences

**Subject Code**
BMS - Biomedical Sciences
**Course Number**
2205

**Academic Unit**
Biomedical Sciences (BMS)

**College/School**
College of Biomedicine (BD)

**Course Duration**
One Semester

**Credit Units**
4

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

**Medium of Instruction**
English

**Medium of Assessment**
English

**Prerequisites**
BMS2004 Biochemistry

**Precursors**
Nil

**Equivalent Courses**
Nil

**Exclusive Courses**
Nil

## Part II Course Details

**Abstract**

This course aims at providing students with hand-on experience of working on the bench with basic molecular biology techniques. This course emphasises on the acquisition of experimental skills and practical abilities to conduct research in biomedical sciences. The main objective of the course is to allow the students to develop critical thinking and troubleshooting skills. At the end of the course, the students should be able to handle equipment and tools commonly used in the laboratory of molecular biology setting, and perform experiments independently.

**Course Intended Learning Outcomes (CILOs)**

| | CILOs | Weighting (if app.) | DEC-A1 | DEC-A2 | DEC-A3 |
|---|---|---|---|---|---|
| 1 | Acknowledge proper laboratory safety and good lab practice | n/a | x | x | x |
| 2 | Develop basic research skills required for biomedical research | n/a | x | x | x |
| 3 | Design and setup of experiments to illustrate key<br>principles in molecular biology | n/a | x | x | x |
| 4 | Analyse and critically evaluate the data collected from<br>experiments | n/a | x | x | x |
| 5 | Summarize and report the observations in a concise scientific format | n/a | x | 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 | Practical | Teaching and learning is primarily based on the protocols set in the course | 1, 2, 3, 4, 5 | |
| 2 | Lecture | Principle of practical and experimental background will be introduced before experiments | 1, 2, 3, 4, 5 | |
| 3 | Experimental results and assignments | Data collection, group discussion and result analyses will be conducted after each practical | 4, 5 | |

**Assessment Tasks / Activities (ATs)**

| | ATs | CILO No. | Weighting (%) | Remarks ("-" for nil entry) | Allow Use of GenAI? |
|---|---|---|---|---|---|
| 1 | Practical performance (skill demonstration, participation in class activities, attendance) | 1, 2, 3, 4, 5 | 50 | - | No |
| 2 | Group discussion and quizzes | 1, 2, 3, 4, 5 | 10 | allow to use GenAI tools to supplement content and critically analyse these AI-generated information | Yes |
| 3 | Experimental Reports and Assignments | 1, 2, 3, 4, 5 | 40 | allow to use GenAI tools to supplement content and critically analyse these AI-generated information | Yes |

**Continuous Assessment (%)**

100

**Examination (%)**

0

**Minimum Continuous Assessment Passing Requirement (%)**

40

**Additional Information for ATs**

“Minimum Passing Requirement” for this course: A minimum of 40% in both practical and assignment components.

**Assessment Rubrics (AR)**

**Assessment Task**

1. Practical performance (skill demonstration, participation in class activities, attendance)

**Criterion**

Ability for self-learning, task implementation, team work and completion of experiment

**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

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**Assessment Task**
2. Group discussion and quizzes

**Criterion**
Ability to understand the principle of experiment

**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

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**Assessment Task**
3.Experimental Reports and Assignments

**Criterion**
Ability to present results and interpret data scientifically

**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

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# Part III Other Information

**Keyword Syllabus**

- Good lab practice and lab safety
- PCR reaction

- Cloning
- Sequencing
- Chromatography
- Western blot analysis
- Southern blots and Northern blots
- RNA expression and Quantitative-RT PCR
- Flow cytometry
- Mouse dissection
- Basic bioinformatics analysis

**Reading List**

**Additional Readings**

| | Title |
|---|---|
| 1 | Practical skills in biomolecular sciences (3rd edition) Rob Reed, David Holmes, Jonathan Weyers, and Allan Jones. Pearson Education Limited. ISBN: 978-0-13-239115-3. Publication date: 2007 |