

Module Outline Template

1. Module Identity

Module Code: LSM3223

Module Title: Immunology

Module Credit: 4MC

2. Module description

This module provides the central concepts of immunology and the foundation for understanding how immunity functions. The subjects of innate immunity and hematopoiesis introduce the origin and role of different cell types in immunity. The mechanics of how the body protects itself from disease are explored in relation to T and B cell biology, antibody-antigen interaction, major histocompatibility complex and antigen presentation. Other topics include allergy, immunodeficiencies, autoimmunity, tumor immunology, resistance and immunization to infectious diseases.

3. Eligibility and requirements

Prerequisites (prior knowledge required): LSM2233 or PR2122 or PHS3123

Corequisites: NIL

Non-allowed subjects (if any): NIL

4. Intended learning outcomes (ILOs) with regard to knowledge and cognitive development

After taking this module, students will:

- a. Understand basic immunology concepts and disease mechanisms.
- b. Able to perform common immunology-related lab techniques.

This module will provide good opportunities for practicing the following cognitive skills

- a) Remember: Recognize, Recall, and Know
- b) Understand: Question, Connect & Explain
- c) Analyze: Differentiate, Organize & Attribute
- d) Evaluate: Review, Check and Critique

This module will provide average opportunities for practicing the following cognitive skills:

- a) Apply: Use, Execute & Implement

5. Intended learning outcomes with regard to generic skills and attributes development

This module will provide good opportunities for learning the following:

- a) Analytical & Critical Thinking
- b) Quantitative Thinking
- c) Interdisciplinary Thinking
- d) Collaboration & Teamwork

This module will provide average opportunities for learning the following:

- a) Verbal/Oral Communication
- b) Digital & Information Literacy
- c) Adaptability & Learnability
- d) Resilience

6. Course content and syllabus

Lectures:

Overview of immunology
Cells and structures of the immune System
Innate immunity
Immunoglobulin structures and functions
Complement
Cytokines and chemokines
Major histocompatibility complex and antigen presentation
Generation of antigen receptor diversity
T and B cell development
T cell functions
B cell activation and functions
Infection and Immunity I
Infection and immunity II
Vaccines and immunization
Allergy
Autoimmunity
Immunodeficiency
Tumour immunology

Lab Sessions:

Cells of the immune system (Phagocytosis and generation of dendritic cells from bone marrow hematopoietic progenitors)
Cell-mediated immunity (T cell activation and proliferation analysis by flow cytometry)
Cell-mediated immunity (Functional analysis of activated T cells by ELISpot)
Antibody-mediated immunity (Blood grouping, bacterial agglutination, and antibody detection by ELISA)

Tutorials: run along with practical #1, #3, and #4

7. Instructional methods

The following instructional methods will be employed to deliver content and achieve intended learning outcomes:

- a) Lecture
- b) Tutorial
- c) Laboratory (Dry/Wet)

8. Learning activities

The following learning activities will be employed to achieve the learning outcomes of knowledge, cognitive, generic skills and/or 'employability' attributes development stated in items 4 and 5 above:

Table for Learning Activities

Case Studies	Laboratory Activities (Wet/Dry)
Class Discussions	Self-Assessment or Quiz
Self-directed Learning	Student Generated Questions

- a. Students will need to integrate immunology with genetics, cell biology and molecular immunology.
- b. Students will need to go through pre-class materials to practice self-directed learning.
- c. Students will be challenged to critically evaluate what they have learned through quiz so that they can practice "unlearn and relearn", and develop analytical and evaluation thinking skills.
- d. Students will participate in class discussions facilitated by the tutors.
- e. Students will work in groups in tutorials and practicals so that they can develop communication skills.
- f. Students will learn from case study to develop thinking skills in application and analysis.
- g. Students will need to do experiments to develop finger skills, analytical skills and problem-solving skills.
- h. Students will have access to past years' Q&As so that they can practice independent learning.

9. Assessments for evaluating students' performance

The following assessments will be employed to encourage and evaluate formative and summative learning in this module:

a **Lab Quizzes** =20%

b. **CA** =30%

d. **Final examination** = 50%

10. Required and/or recommended readings

Cellular and Molecular Immunology (Abul Abbas, et al), 8th or newer edition
Janeway's Immunobiology, 9th or newer edition

11. Contact information for Module Coordinator and other instructors

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