TQF 3 Course Specifications

Section 1 General Information

1. Course code and course title

Thai	ICBI 303 วิทยาภูมิคุ้มกันขั้นพื้นฐาน
English	ICBI 303 Basic Immunology

2. Number of credits: 4 (4-0-8)

3. Program and type of subject

3.1 Program	Undergraduate Degree (International Program)
3.2 Type of Subject	Major Elective Course

4. Course Coordinator and Course Lecturer

4.1	Course Coordinator	Prapaporn Thamtarana, Ph.D.
4.2	Course Lecturer	Prapaporn Thamtarana, Ph.D. <prapaporn.jun@mahidol.edu> Zahid Pranjol, Ph.D. <Z.Pranjol@sussex.ac.uk> Chanitra thuwajit, Ph.D., M.D. <chanitra.thu@mahidol.ac.th> Kobporn Boonnak, Ph.D. <kobporn.boo@mahidol.ac.th>

5. Trimester/ Year of Study

5.1 Trimester	Trimester 2/2021-2022
5.2 Course Capacity	45 students

6. Pre-requisite: ICBI 214 General Microbiology, ICBI 216 Cell Biology

7. Co-requisites: N/A

8. Venue of Study: Mahidol University Salaya Campus

9. Date of Latest Revision: 11 Oct 2021

Section 2 Goals and Objectives

1. Course Goals

This course introduces the students to the basic and understanding of immune systems. Students should be able to describe innate and adaptive immune responses and discuss how they coordinate. Students should comprehend the basic of experimental immunology, where they should be able to extract relevant information to deliver a concise scientific report.

2. Objectives of Course Development/Revision

2.1 Course Objectives

To be successful in this module and gain competencies outlined in module learning outcomes, students are expected to attend all lectures, pre/postlab sessions and practical sessions. Self-study of lecture materials and associated reading lists is essential.

2.2 Course-level Learning Outcomes: CLOs

At the end of this module, and with independent study, a successful student should be able to:

CLO1 - Display a sound knowledge and understanding of the major players in the innate and adaptive immune responses and discuss how they coordinate and are regulated to defend the host.

CLO2 - Gather, analyse and interpret data from experimental immunology. Extract relevant information from appropriate sources and deliver a concise scientific report based on this.

CLO3 - Describe and discuss immune related conditions and their clinical relevance.

Section 3 Course Management

1. Course Description

(Thai) วิทยาการใหม่ ๆ เกี่ยวกับปฏิสัมพันธ์ของเซลล์และโมเลกุลในการเหนี่ยวนำ การแสดงออก และการควบคุมระบบภูมิคุ้มกันของร่างกาย การประยุกต์เกี่ยวกับการสร้างภูมิคุ้มกันของร่างกายในการป้องกันโรคที่เกิดจากจุลินทรีย์และปฏิกิริยาแอนติเจนแอนติบอดี การวินิจฉัยและตรวจสอบการตอบสนองของภูมิคุ้มกันในเซลล์

(English) Current understanding of the cellular and molecular interactions in the inductions, expression, and regulation of the cellular and humoral immune responses; recent knowledge and applications concerning immunity to various microbial infections as well as antigen-antibody interactions; serodiagnosis and detection of cell-mediated immune response

2. Credit hours per trimester

Lecture (Hour(s))	Laboratory/field trip/internship (Hour(s))	Self-study (Hour(s))
48 (4 h x 12 wk)	-	96 h (8 hr x 12 wk)

3. Number of hours that the lecturer provides individual counseling and guidance.

4 hours/week (or more depending on the demand)

Section 4 Development of Students' Learning Outcome

1. Summary of the knowledge or skills that the course intends to develop in students (CLOs)

This class is a continuation of basic biological science knowledge from microbiology and cell biology. Students should be able to comprehend the inter-relatedness of the human immune system as well as in various clinical applications.

2. Teaching methods for developing the knowledge or skills specified in item 1 and evaluation methods of the course learning outcomes

ICBI 303	Teaching methods	Evaluation Methods
CLO1	Lectures, recitation sessions, written assignment, discussion, oral presentation, self-study	Written assignment, oral presentation, discussion, written assessments (e.g., MCQ, short answers, long answers)
CLO2	Lectures, recitation sessions, written assignment, discussion, oral presentation, self-study	Written assignment, oral presentation, discussion, written assessments (e.g., MCQ, short answers, long answers)
CLO3	Lectures, recitation sessions, written assignment, discussion, oral presentation, self-study	Written assignment, oral presentation, discussion, written assessments (e.g., MCQ, short answers, long answers)

Section 5 Teaching and Evaluation Plans

1. Teaching plan

Week	Topic	Lecture Hours	Online/On-campus	Teaching Activities/ Media	Lecturer

1	Introduction to Innate Immunity	2	Online	Introduction and discussion, lectures	ZP
	Introduction to Innate Immunity (cont.)	2	Online	Lectures, discussion, case study	ZP
2	Phagocytosis, antigen presentation and the complement system	2	Online	Lectures, discussion, case study	ZP
	Phagocytosis, antigen presentation and the complement system (cont.)	2	Online	Lectures, discussion, case study	ZP
3	Introduction to adaptive immunity- lymphocyte development	2	Online	Lectures, discussion, case study	ZP
	Introduction to adaptive immunity- lymphocyte development (cont.)	2	Online	Lectures, discussion, case study	ZP
4	T cell mediated response	2	Online	Lectures, discussion, case study	ZP
	T cell mediated response (cont.)	2	Online	Recitation and discussion	ZP
5	Antibody and antigen interaction- role of B cells	2	Online	Lectures, discussion, case study	ZP
	Antibody and antigen interaction- role of B cells (cont.)	2	Online	Lectures, discussion, case study	ZP
6	Immunologists toolbox- research and experimental methods	2	Online	Lectures, discussion, case study	ZP
	Review	2	Online	Review	ZP
7	Mid-term	2	Online	Mid-term exam	
	Purification of polyclonal antibodies from serum	2	Online	Lectures, discussion, case study	PT
8	Immunoelectrophoresis and enzyme-linked immunosorbent assay	2	Online	Lectures, discussion, case study	PT
	Hypersensivity	2	Online	Lectures, discussion, case study	PT
9	Autoimmunity	2	Online	Lectures, discussion, case study	PT

	Immunodeficiency	2	Online	Lectures, discussion, case study	PT
10	Cancer immunology	2	Online	Lectures, discussion, case study	CT
	Immunotherapy	2	Online	Lectures, discussion, case study	CT
11	Immunology of vaccination	2	Online	Lectures, discussion, case study	KB
	Transplantation immunology	2	Online	Lectures, discussion, case study	KB
12	Assignment presentation	2	Online	Assignment presentation	PT
	Assignment presentation	2	Online	Assignment presentation	PT
	Total	48			

2. Plan for Assessing Course Learning Outcomes

2.1 Assessing and Evaluating Learning Achievement

a. Formative Assessment

Learning Outcomes	Assessment Methods	Assessment Ratio (Percentage)
CLO1 - Display a sound knowledge and understanding of the major players in the innate and adaptive immune responses and discuss how they coordinate and are regulated to defend the host	Poster oral presentation	18%
	Poster layout, design, and preparation	9%
	Peer assessment	3%
CLO2 - Gather, analyse and interpret data from experimental immunology. Extract relevant information from appropriate sources and deliver a concise scientific report based on this.	Written report	30%
Total		60%

b. Summative Assessment

(1) Tools and Percentage Weight in Assessment and Evaluation

Learning Outcomes	Assessment Methods	Assessment Ratio (Percentage)
CLO1 - Display a sound knowledge and understanding of the major players in the innate and adaptive immune responses	Final written assessment	10%

and discuss how they coordinate and are regulated to defend the host		
CLO2 - Gather, analyse and interpret data from experimental immunology. Extract relevant information from appropriate sources and deliver a concise scientific report based on this.		5%
CLO3 - Describe and discuss immune related conditions and their clinical relevance		25%
Total		40%

(2) Grading System

Grade	Achievement	Final Score (% Range)	GPA
A	Excellent	90-100	4.0
B+	Very good	85-89	3.5
B	Good	80-84	3.0
C+	Fairy good	75-79	2.5
C	Fair	70-74	2.0
D+	Poor	65-69	1.5
D	Very poor	60-64	1.0
F	Fail	Less than 60	0.0

(3) Re-examination is not allowed.

3. Student Appeals

Following MUIC policy.

Section 6 Teaching Materials and Resources

1. Textbooks and/or other documents/materials

1) Abbas, A, Lichtman A, Pillai S. Cellular and Molecular Immunology. 10th Ed. Philadelphia: Elsevier, 2021
2) Murphy KM. Janeway's Immunobiology. 9th Ed. New York: Garland Science, 2017.
3) Punt J, Stranford S, Jones P, Owen J. Kuby Immunology. 8th Ed. New York: W.H. Freeman, 2019.
4) Parham P. The Immune System. 4th Ed. New York: Garland Science/Taylor & Francis Group, 2015.

2. Recommended textbooks and/or other documents/materials

1) Online academic databases (i.e., sciencedirect.com, isiwebofknowledge.com)

3. Other Resources (If any)

1) Carter M. Designing Science Presentations: A Visual Guide to Figures, Papers, Slides, Posters, and More. 2nd Ed. London, UK: Academic Press; 2021.

Section 7 Evaluation and Improvement of Course Management

1. Strategies for evaluating course effectiveness by students

- At the end of the course, students will assess the effectiveness of teaching and learning via MUIC Sky System. The evaluation will acquire anonymous students' feedback on course content, course management, faculty performance, and other suggestions
- Reflective paragraph of the end of the course

2. Strategies for evaluating teaching methods
    - Students' feedbacks
    - Quantitative analysis of the performance of course assignments and assessments (mean, median, mode, and noticeable disparity)
    - Reflection and submission of TQF5
    - Reflective paragraph by the instructor

3. Improvement of teaching methods
    - Continuously obtain students' feedback throughout the course
    - Allocation of time and alteration of teaching pace as appropriate
    - Invite a guest instructor to observe the class. Guest instructor provides class observation feedback

4. Verification process for evaluating students' standard achievement outcomes in the course
    - Acquire students' verbal feedback on formal written assessments regarding the structure and management of the assignments and assessments

5. Review and plan for improving the effectiveness of the course
    - Review the course before the trimester starts
    - Review the objectives and goals before each teaching period
    - Students' verbal feedback

Appendix

Alignment between Courses and Program

Table 1 The relationship between course and Program Learning Outcomes (PLOs)

ICBI 303 Immunology 4 (4-0-8)	Program Learning Outcomes (PLOs)					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
	R	R	R	R	R	

Note: Indicate the level of CLOs by the letter I, R, P, or M. Using the information as shown in the Curriculum Mapping of TQF2

Table 2 The relationship between CLOs and PLOs

ICBI 303	Program Learning Outcomes (PLOs)					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1 - Display a sound knowledge and understanding of the major players in the innate and adaptive immune responses and discuss how they coordinate and are regulated to defend the host	1.1, 1.2, 1.4		3.1, 3.2			
CLO2 - Gather, analyse and interpret data from experimental immunology. Extract relevant information from appropriate	1.3	2.1, 2.2	3.1, 3.2	4.2		

sources and deliver a concise scientific report based on this.						
CLO3 - Describe and discuss immune related conditions and their clinical relevance	1.1, 1.2, 1.5				5.1, 5.2	

Table 3 The description of PLOs and Sub PLOs of the course

Program Learning Outcomes (PLOs)	SubPLOs
1. Apply knowledge and technical skills of diverse biological disciplines to address health, societal and environmental issues	1.1 Explain the fundamental and detailed knowledge of biological sciences
	1.2 Apply knowledge in biological sciences to address health, societal and environmental issues
	1.3 Perform experimentation in laboratory or field
	1.4 Apply technical skills in biological sciences to address health, societal and environmental issues

	1.5 Integrate biological sciences knowledge and technical skills across different disciplines to solve problems in biological sciences
2. Critically appraise information from scientific articles/journals, biological research methodology, and experimentation to draw a meaningful conclusion from the materials	2.1 Explain qualitative and quantitative data and/or ideas in basic biological sciences
	2.2 Draw meaningful conclusion from the learning materials such as scientific articles, research methodology, and scientific findings
	2.3 Retrieve relevant scientific information independently from textbooks, literatures, and databases
	2.4 Manage scientific literatures using a reference-management program
	2.5 Assess the scientific relevance of information acquired to the objective at hand
3. Proficient in oral and written communication of biological sciences concepts formally and informally to both scientific community and general audience	3.1 Proficient in oral communication of ideas, concepts, and findings in biological sciences to both the scientific community and the wider society

	3.2 Proficient in written communication of ideas, concepts, and findings biological sciences to both the scientific community and the wider society
4. Apply scientific integrity, professionalism, and competencies to function independently as well as as a team player	4.1 Maintain data integrity using appropriate tools and acceptable methods
	4.2 Work independently or coordinate with others to complete tasks at hand
	4.3 Apply concepts of lab and fieldwork safety when carrying out the tasks
	4.4 Set, plan and accomplish the assigned project in a timely manner
5. Apply moral and ethical values when dealing with issues relating to humans, animals, and the environment, enabling actions based on moral and ethical judgment	5.1 Recognize ethical issues in human and animal experimentation
	5.2 Recognize emerging ethical issues in biological sciences

	5.3 Apply accepted ethical standards to resolve ethical dilemma
	5.4 Implement the course of action in accordance with moral and ethical judgment
6. Demonstrate innovative mindset to formulate and create solutions for situations relevant to oneself, the well-being of others, and the natural environment	6.1 Formulate lines of enquiry to drive problem-solving relevant to oneself, the well-being of others, and the natural environment
	6.2 Formulate a process for data acquisition based on scientific methodology
	6.3 Demonstrate systematic and logical thinking in formulating solutions through the application of knowledge and technical skills acquired from the different biological science disciplines
	6.4 Explain the potential for knowledge transfer to innovation
	6.5 Create networks to learn from others and create new ideas