



TQF 3 Course Specifications

Section 1 General Information

1. Course code and course title

Thai เนื้อเยื่อวิทยา

English Functional Histology

2. Number of credits 4 (3-2-7) (Lecture/Lab/Self-study)

3. Program and type of subject

3.1 Program Bachelor of Science (Biological Sciences)

3.2 Type of Subject Elective

4. Course Coordinator and Course Lecturer

4.1 Course Coordinator Dr. Laphatrada Yurasakpong, PhD.

4.2 Course Lecturers Assoc. Prof. Wisuit Pradidarcheep, PhD.

Asst. Prof. Athikhun Suwannakhan, PhD.

Asst. Prof. Nutmethee Kruepunga, PhD

5. Trimester/ Year of Study

5.1 Trimester 1/2023-2024

5.2 Course Capacity 30 students

6. Pre-requisite N/A

7. Co-requisites N/A

8. Venue of Study Mahidol University Salaya Campus

9. Date of Latest Revision 28 August 2023



Section 2 Goals and Objectives

1. Course Goals

The main intend of this course is to immersive students into the intricate realm basic tissue and cell structures that underpin biological systems. This course aims to provide students with a comprehensive understanding of tissue structures and functions at the microscopic level. Students will understand how groups of cells functions together for our body systems including musculoskeletal system, integumentary system, nervous system, lymphatic system, respiratory system, cardiovascular system, gastrointestinal system, and reproductive system. In laboratory session provide students with convenience to learn the human tissue from digital slide to further students' interpretation.

2. Objectives of Course Development/Revision

2.1 Course Objectives

Students commiserate with normal structural and function of the human tissues and cells in sufficient depth for classification each type of tissues and cells by recognizing basic tissue principles.

2.2 Course-level Learning Outcomes: CLOs

By the end of the course, students will be able to (CLOs)

CLO1 – Identify all types of epithelia and know their locations and describe and identify the major forms of the connective tissue.

CLO2 – Describe the microscopic anatomy of compact and cancellous bone and bone formation and differentiate three major types of muscles.

CLO3 – Describe and identify the typical nerve cell and describe the organization and structure of the central nervous system and peripheral nervous system.

CLO4 – Describe the organization and structure of the skin, skin barrier and receptors.

CLO5 – Describe and differentiate the microscopic structures between the arteries,



veins and capillaries, and their relation to the heart.

CLO6 – Describe the structure of blood and differentiate the plasma, red blood cells, leucocytes, platelets, and lymphoid tissue.

CLO7 – Describe the microscopic structure and organization of the respiratory and digestive tract.

CLO8 – Describe the microscopic structure and organization of the urinary system, male reproductive system, female reproductive system, the ovarian cycle and structures of pregnancy.

Section 3 Course Management

1. Course Description

(Thai) ความเข้าใจพื้นฐานของโครงสร้างทางจุลกายวิภาคและหน้าที่ของเยื่อบุผิว เนื้อเยื่อเกี่ยวพัน ระบบกล้ามเนื้อ และกระดูก ระบบประสาท ระบบผิวหนัง ระบบหลอดเลือด ระบบผิวหนัง ระบบน้ำเหลือง ระบบหายใจ ระบบย่อยอาหาร ระบบทางเดินปัสสาวะ และระบบสืบพันธุ์

(English) Basic understanding of microanatomical organization and function of the epithelium, connective tissue, musculoskeletal system, nervous system, integumentary system, vascular system, integumentary system, lymphoid system, respiratory system, digestive system, urinary system, and reproductive system.

2. Credit hours per trimester

Lecture (Hours)	Laboratory/field trip/internship (Hours)	Self-study (Hours)
30	20	96



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

Section 4 Development of Students' Learning Outcome

1. Short summary on the knowledge or skills that the course intends to develop in students (CLOs)

ICBI 301 is an introductory course to neuroscience and neuroanatomy. Comprehensive understanding in microanatomy is essential for students who would like to pursue their future career as biomedical scientists or physicians. This course is mainly focused on the structural organization of microscopic structures of the human body as well as basic physiology. Students will be taught the basic organization of epithelium, different types of the connective tissue. Students will then learn how these components work together as tissue and perform body functions with respect to different systems in the body including musculoskeletal system, nervous system, integumentary system, vascular system, integumentary system, lymphoid system, respiratory system, digestive system, and urinary system and reproductive system. Laboratory sessions are computer-based using virtual histology slides. The knowledge gained from this course is an important basis for the understanding of human anatomy, physiology, and pathology.

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

CLO	Teaching methods	Evaluation Methods
CLO1	Lectures, class discussion and case studies	Written assessment
CLO2	Lectures, class discussion and case studies	Written assessment
CLO3	Lectures, class discussion and case studies	Written assessment
CLO4	Lectures, class discussion and case studies	Written assessment
CLO5	Lectures, class discussion and case studies	Written assessment
CLO6	Lectures, class discussion, and case studies	Written assessment
CLO7	Lectures, class discussion, and case studies	Written assessment



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CLO8	Lectures, class discussion, and case studies	Written assessment
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Section 5 Teaching and Evaluation Plans

1. Teaching plan

Date	Time	Topic	Lecturer
Fri, 15 Sep 23	09:00 – 11:50	Lec 1 - Orientation class - Histology technique - Epithelium and connective tissue	LY
	13:00 – 14:50	<u>Lab 1</u> - Epithelium and connective tissue	LY
Fri, 22 Sep 23	09:00 – 11:50	Lec 2 - Musculoskeletal system	AS
	13:00 – 14:50	<u>Lab 2</u> - Musculoskeletal system	AS
Fri, 29 Sep 23	09:00 – 11:50	Lec 3 - Nervous system	NK
	13:00 – 14:50	<u>Lab 3</u> - Nervous system	NK
Fri, 6 Oct 23	09:00 – 11:50	Lec 4 - Integumentary system	WP
	13:00 – 14:50	<u>Lab 4</u> - Integumentary system	WP
Fri, 13 Oct 23	09:00 – 11:50	No class (King Bhumibol's Memorial Day)	
	13:00 – 14:50		
Fri, 20 Oct 23	09:00 – 11:50	Lec 5 - Lymphatic system	WP
	13:00 – 14:50	<u>Lab 5</u> - Lymphatic system	WP
Fri, 27 Oct 23	09:00 – 11:00	MIDTERM LECTURE EXAMINATION	TBA, LY
	11:00 – 12:00	MIDTERM LAB EXAMINATION	TBA, LY
Fri, 3 Nov 23	09:00 – 11:50	Lec 6 - Respiratory system	WP
	13:00 – 14:50	<u>Lab 6</u>	WP



		- Respiratory system	
Fri, 10 Nov 23	09:00 – 11:50	Lec 7 - Cardiovascular system	NK
	13:00 – 14:50	<u>Lab 7</u> - Cardiovascular system	NK
Fri, 17 Nov 23	09:00 – 11:50	Lec 8 - Gastrointestinal system	NK
	13:00 – 14:50	<u>Lab 8</u> - Gastrointestinal system	NK
Fri, 24 Nov 23	09:00 – 11:50	Lec 9 - Urinary and male reproductive system	AS
	13:00 – 14:50	<u>Lab 9</u> - Urinary and male reproductive system	AS
Fri, 1 Dec 23	09:00 – 11:50	Lec 10 - Female reproductive system	NK
	13:00 – 14:50	<u>Lab 10</u> - Female reproductive system	NK
Fri, 8 Dec 23	09:00 – 11:00	FINAL LECTURE EXAMINATION	TBA, LY
	11:00 – 12:00	FINAL LAB EXAMINATION	TBA, LY
Date	Time	Topic	Lecturer
Fri, 15 Sep 23	09:00 – 11:50	Lec 1 - Orientation class - Histology technique - Epithelium and connective tissue	LY
	13:00 – 14:50	<u>Lab 1</u> - Epithelium and connective tissue	LY
Fri, 22 Sep 23	09:00 – 11:50	Lec 2 - Musculoskeletal system	AS
	13:00 – 14:50	<u>Lab 2</u> - Musculoskeletal system	AS
Fri, 29 Sep 23	09:00 – 11:50	Lec 3	NK



		- Nervous system	
	13:00 – 14:50	<u>Lab 3</u> - Nervous system	NK
Fri, 6 Oct 23	09:00 – 11:50	Lec 4 - Integumentary system	WP
	13:00 – 14:50	<u>Lab 4</u> - Integumentary system	WP
Fri, 13 Oct 23	09:00 – 11:50	No class (King Bhumibol's Memorial Day)	
	13:00 – 14:50		
Fri, 20 Oct 23	09:00 – 11:50	Lec 5 - Lymphatic system	WP
	12:00 – 14:50	<u>Lab 5</u> - Lymphatic system	WP
Fri, 27 Oct 23	09:00 – 11:00	MIDTERM LECTURE EXAMINATION	TBA, LY
	11:00 – 12:00	MIDTERM LAB EXAMINATION	TBA, LY
Fri, 3 Nov 23	09:00 – 11:50	Lec 6 - Respiratory system	WP
	13:00 – 14:50	<u>Lab 6</u> - Respiratory system	WP
Fri, 10 Nov 23	09:00 – 11:50	Lec 7 - Cardiovascular system	NK
	13:00 – 14:50	<u>Lab 7</u> - Cardiovascular system	NK
Fri, 17 Nov 23	09:00 – 11:50	Lec 8 - Gastrointestinal system	NK
	13:00 – 14:50	<u>Lab 8</u> - Gastrointestinal system	NK
Fri, 24 Nov 23	09:00 – 11:50	Lec 9 - Urinary and male reproductive system	AS
	13:00 – 14:50	<u>Lab 9</u> - Urinary and male reproductive system	AS
Fri, 1 Dec 23	09:00 – 11:50	Lec 10	NK



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		- Female reproductive system	
	12:00 – 14:50	<u>Lab 10</u> - Female reproductive system	NK
Fri, 8 Dec 23	09:00 – 11:00	FINAL LECTURE EXAMINATION	TBA, LY
	11:00 – 12:00	FINAL LAB EXAMINATION	TBA, LY

2. Plan for Assessing Course Learning Outcomes

2.1 Assessing and Evaluating Learning Achievement

a. Formative Assessment

1. In-class assignment
2. Mock test



b. Summative Assessment

(1) Tools and Percentage Weight in Assessment and Evaluation

Learning Outcomes	Assessment Methods	Assessment Ratio (Percentage)
CLO1	Written assessment – MCQ, short answer, long answer	10
CLO2		10
CLO3		10
CLO4		10
CLO5		10
CLO6		10
CLO7		20
CLO8		20
	Total	100

(2) Grading System

Percentage	Achievement	Letter grade	GPA
90-100%	Excellent	A	4.0
86-89%	Very good	B+	3.5
80-85%	Good	B	3.0
75-79%	Fairly good	C+	2.5
70-74%	Fair	C	2.0
65-69%	Poor	D+	1.5
60-65%	Very poor	D	1.0
< 60%	Fail	F	0.0

(3) Re-examination (If course lecturer allows to have re-examination)



N/A - (Not applicable with MUIC)

3. Student Appeals

Students are able to submit appeals either in person or via email to laphatrada.yur@mahidol.edu within 7 days of receiving the final grade.

Section 6 Teaching Materials and Resources

1. Textbooks and/or other documents/materials

Pawlina, Wojciech, and Michael H. Ross. Histology: a text and atlas: with correlated cell and molecular biology. Lippincott Williams & Wilkins, 2018.

Cui, Dongmei. Atlas of histology: with functional and clinical correlations. Lippincott Williams & Wilkins, 2011.

2. Resources for laboratory classes

<https://histologyguide.com/>

<https://peir-vm.path.uab.edu/uab-histology.php>

<https://histology.medicine.umich.edu/>

Section 7 Evaluations and Improvement of Course Management

1. Strategies for evaluating course effectiveness by students

- Student evaluation at the end of the trimester
- Verbal feedbacks from students

2. Strategies for evaluating teaching methods

- Student evaluation at the end of the trimester
- Verbal feedbacks from students
- Obtain feedback from the other instructor

3. Improvement of teaching methods

- Continuously ask for feedback from students during the course
- Student evaluation at the end of the trimester
- Obtain feedback from the other instructor



4. Verification process for evaluating students' standard achievement outcomes in the course
 - Continuously ask for feedback from students during the course
 - Consultation with the other instructor
5. Review and plan for improving the effectiveness of the course
 - Revision of class materials, objectives and goals prior to the beginning of the course
 - Modification to the teaching pedagogy based on students' evaluation

Appendix

Alignment between Courses and Program

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

Course Name	Program Learning Outcomes (PLOs)							
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
Scientific Research and Presentation								
ICBI301	R	R	R	R	R	R	R	R

Note: Indicate the level of CLOs by 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 301	Program Learning Outcomes (PLOs)					
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CLO1 Identify all types of epithelia and know their locations and describe and identify the major forms of the connective tissue.	1.1 1.2 1.3 1.5					



CLO2 Describe the microscopic anatomy of compact and cancellous bone and bone formation and differentiate three major types of muscles.	1.1					
	1.2					
	1.3					
	1.5					
CLO3 Describe and identify the typical nerve cell and describe the organization and structure of the central nervous system and peripheral nervous system.	1.1					
	1.2					
	1.3					
	1.5					
CLO4 Describe the organization and structure of the skin, skin barrier and receptors.	1.1					
	1.2					
	1.3					
	1.5					
CLO5 Describe and differentiate the microscopic structures between the arteries, veins and capillaries, and their relation to the heart.	1.1					
	1.2					
	1.3					
	1.5					
CLO6 Describe the structure of blood and differentiate the plasma, red blood cells, leucocytes, platelets, and lymphoid tissue.	1.1					
	1.2					
	1.3					
	1.5					
CLO7 Describe the microscopic structure and organization of the respiratory and digestive tract.	1.1					
	1.2					
	1.3					
	1.5					
CLO8 Describe the microscopic structure and organization of the urinary system, male reproductive system, female reproductive system, the ovarian cycle and structures of pregnancy.	1.1					
	1.2					
	1.3					
	1.5					

Table 3 The description of PLOs and Sub Los 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 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



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	6.4 Explain the potential for knowledge transfer to innovation
	6.5 Create networks to learn from others and create new ideas