

Master of Science Program in Anatomy and Structural Biology  
(International Program)  
Revised Program in 2022

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Name of Institution Mahidol University  
Campus/Faculty/Department Faculty of Science, Department of Anatomy

### Section 1 General Information

#### 1. Curriculum Name

**Thai** : หลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาวิชากายวิภาคศาสตร์และชีววิทยา  
โครงสร้าง  
(หลักสูตรนานาชาติ)  
**English** : Master of Science Program in Anatomy and Structural Biology  
(International Program)

#### 2. Name of Degree and Major

Full Title Thai : วิทยาศาสตรมหาบัณฑิต (กายวิภาคศาสตร์และชีววิทยาโครงสร้าง)  
Abbreviation Thai : วท.ม. (กายวิภาคศาสตร์และชีววิทยาโครงสร้าง)  
Full Title English : Master of Science (Anatomy and Structural Biology)  
Abbreviation English : M.Sc. (Anatomy and Structural Biology)

3. Major Subjects (if any) : None

4. Required Credits : not less than 36 credits

#### 5. Curriculum Characteristics

- 5.1 Curriculum type/model : Master's Degree
- 5.2 Language : English
- 5.3 Recruitment : Thai and international students
- 5.4 Collaboration with Other Universities : This program is Mahidol University's program.
- 5.5 Graduate Degrees Offered to the Graduates : One degree

## 6. Curriculum Status and Curriculum Approval

- 6.1 Program : Revised program in 2022
- 6.2 Starting in semester 1, academic year 2022 onwards
- 6.3 Curriculum screening committee approved the program in its meeting 13/2021 on 21 June, 2021 and meeting 33/2021 on 22 November, 2021
- 6.4 The Mahidol University Council approved the program in its meeting 577 On 23 February, 2022

## 7. Readiness to Implement/Promote the Curriculum

The curriculum from the program is readily implemented and promoted its quality and standard according to criteria set by Thai Qualification Framework for Higher Education in academic year 2024 (2 years after implementation).

## 8. Career Opportunities of the Graduates

- 8.1 Specialist in Anatomy and Structural Biology in educational institutions
- 8.2 Researcher or scientist in Anatomy and Structural Biology and related biomedical fields in public and private research institutes
- 8.3 Knowledge transfer specialist or consultant in Anatomy and Structural Biology in government or related private companies

## 9. Name, ID Number, Title and Degree of the Faculty in Charge of the Program

No.	Identification Card Number Academic position Name–Surname	Degree (Field of Study) University: Year of graduate	Department
1.	xxxxxxxxxxxxx Associate Professor Dr. Kanokpan Wongprasert	Ph.D. (Anatomy), Mahidol University : 2001 M.Sc. (Anatomy), Mahidol University: 1992 B.Sc. (Physical Therapy) First Class Honor), Mahidol University: 1988	Department of Anatomy, Faculty of Science, Mahidol University

No.	Identification Card Number Academic position Name–Surname	Degree (Field of Study) University: Year of graduate	Department
2.	xxxxxxxxxxxxx Associate Professor Dr. Rapeepun Vanichviriyakit	Ph.D. (Anatomy), Mahidol University : 2007 B.Sc. (Physical Therapy), Second Class Honor Srinakharinwirot University: 1998	Department of Anatomy, Faculty of Science, Mahidol University
3	xxxxxxxxxxxxx Associate Professor Dr. Yotsawan Tinikul	Ph.D. (Anatomy) Mahidol University: 2008 M.Sc. (Anatomy) Chiang Mai University: 2004 B.Sc. (Zoology), Chiang Mai University: 2002	Department of Anatomy, Faculty of Science, Mahidol University
4.	xxxxxxxxxxxxx Assistant Professor Chinnawut Suriyonplengsaeng	Diploma of Thai Board of Anatomical Pathology, Medical Council of Thailand, Mahidol University: 2015 M.D. Mahidol University: 2009	Department of Anatomy, Faculty of Science, Mahidol University
5.	xxxxxxxxxxxxx Assistant Professor Dr. Worawit Supamungmee	Ph.D. (Anatomy), Mahidol University: 2005 M.Sc. (Anatomy) Mahidol University: 2001 B.Sc. (Radiologic Technology), Chiang Mai University: 1999	Department of Anatomy, Faculty of Science, Mahidol University

## 10. Venue for Instruction

Department of Anatomy, Faculty of Science, Mahidol University, Phayathai campus, Bangkok

## 11. External Factors to Be Considered in Curriculum Planning

### 11.1 Economic Situation/Development

Capacity constraints on enhancing Thailand's competitiveness in the past have been engaged with several factors such as the poor quality of people, a low investment in research and development for science, technology and innovation. Thailand is in a situation where it is losing its advantage, yet it cannot compete with other countries with the most advanced innovation and creativity. This is the biggest obstacle to push the country forward to become a developed country.

The Thailand National Strategy (2561-2580) has been generated and pursued to ensure that the country achieves its vision of becoming “a developed country with security, prosperity and sustainability in accordance with the Sufficiency Economy Philosophy” with the ultimate goal of being all Thai people’s happiness and well-being. The key goals of national development of the National Strategy are A Secure Nation, Contented People, Continued Economic Growth, An Equal Society, and Sustainable Natural Resources.

The vision of Ministry of Higher Education, Science, Research and Innovation (MHESRI) is to enhance capacities to promote sustainable and constraint economic development by the year 2580. It focuses on promoting the development of science, technology, research and innovation at the advanced level along with the development of high skilled workforce according to the need of the country. Therefore, the major driver of long-run economic growth has to be research and development and technological progress.

To support the country’s policies in achieving inclusive and sustainable wealthy and economic development, and being ready for enhancing both quantitative and qualitative research and innovation development, the curriculum in the Master of Science in Anatomy and Structural Biology is revised to develop graduates with advanced knowledge and research technologies who are capable of applying, integrating, and creating a body of knowledge which skills are essential to support the sustainable development of the country. The curriculum offers a wide range of basic cognitive learning and advance researches in Life Science, Medical and Biological Sciences for solving the country’s threats in both public health sector, in particular issues on age-associated and emerging diseases, and agricultural

sector to compete in international level. Academic research networking across the country and collaboration with the public and industrial sectors both national and international levels is strengthening to create effective program development.

### **11.2 Social and Cultural Situation/Development**

In recent years, there have been many global disruptions that have impacts on traditional educational institutions/programs and employment arrangements. The adoption of information technologies such as artificial intelligence (AI), robotics, and data analytics are increasingly turning towards the digital economy and society. In addition, the COVID-19 pandemic as well as the transition to aging society have greatly impacted the lives and livelihoods of people all around the world. One of the National strategic plans is to improve well-being and quality of life of Thai people, and society. Regarding these social and cultural changes and the national strategic plan, the Master of Science in Anatomy and Structural Biology program concerns, more than ever, the importance of preparing graduates who are ready for the future workforce. The revised program aims of producing competent graduates, by placing greater emphasis on self-learning development, lifelong-learning opportunities, collective work with the necessary information technology tools and skills for the socio-cultural transition.

## **12. The Effects Mentioned in No.11.1 and 11.2 on Curriculum Development and Relevance to the Missions of the University/Institution**

### **12.1 Curriculum Development**

From the economic, social and cultural impacts, the curriculum is revised in response to the current global changes and needs as follows:

12.1.1 The study plan is revised with the aim of enhancing student outcome to gain current and advance knowledge in Anatomy and Structural Biology and be able to integrate with subjects related.

(1) The teaching and learning processes are designed to enhance life-long learning and scientific thinking, collective working with the necessary information technology tools and skills, as well as to develop leadership and interpersonal skills that can be applied to the benefits of social and cultural changes.

(2) The research-based knowledge is strengthening to enhance research quality to meet national or international standard. Basic and applied researches are emphasized to

drive research innovation development to enhance competitiveness of the country in both the people well-being and the sustainable and economic development.

### **12.2 Relevance to the Missions of the University/Institution**

The mission of Mahidol University is to create excellence in health, science, arts and innovation based on virtue for Thai society and the benefit of humankind. Master of Science Program in Anatomy and Structural Biology places emphasis on producing a competent Master of Science in both academic and research knowledge and being able to pursue life-long learning throughout life. Graduates have a vision of applying knowledge and research to solve problems with efficiency, suitability, and morality in line with the university's mission of academic excellence and wisdom of the land.

## **13. Collaboration with Other Curricula of the University (if any)**

### **13.1 Course(s) offered by other faculties/departments/ programs:**

1 compulsory course:

SCID 518	Generic Skills in Science Research	1(1-0-2)
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4 elective courses:

SCID 500	Cell and Molecular Biology	3(3-0-6)
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SCID 509	Separation Techniques	1(0-2-1)
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SCID 513	Animal Cell Culture Techniques	1(0-2-1)
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SCID 535	Database Management for Research	1(0-2-1)
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### **13.2 Course(s) offered to other programs:**

3 courses:

SCAN 607	Advanced Microscopy and Structural Biology	2(1-2-3)
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SCAN 620	Selected Topics in Cellular Neuroscience	1(1-0-2)
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SCAN 626	Modern Anatomical Imaging	1(0-2-1)
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### **13.3 Coordination:**

13.3.1 The curriculum management procedures are as follows:

(1) The program appoints a course coordinator to take responsibility with the instructors in determining the course objectives, schedules, teaching and learning processes, evaluation, and coordinating with the Department, the Faculty of Graduate Studies and other agencies

(2) The program arranges regular meetings with all instructors or invited instructors in writing subject content in accordance with the course objectives, lesson plans

and course descriptions. As well as assign tasks to the education supporting staff in the courses, organize grades-cutting meetings, evaluate the learning assessment, and improve the course operation.

13.3.2 The administrative procedures for inter-departmental learning courses are as follows:

(1) The program director informs students to register for the courses according to the study plan.

(2) The Program director coordinates with course coordinator to monitor student's academic performance.

## Section 2 Information of the Curriculum

### 1. Philosophy, Justification, and Objectives of the Curriculum

#### 1.1 Philosophy and Justification of the Curriculum

The Master of Science Program aims at producing graduates who have up to date knowledge in the field of Anatomy and Structural Biology, and develop capability to systematically conduct scientific research in the field and positively that impact the scholarly community and the country, with a moral and ethical responsibility in the work.

#### 1.2 Objectives of the Program

At the end of the program, a graduate will have characteristics in compliance with the Office of the Higher Education Commission's standard criteria for graduate program as follows:

(1) Having moral standards, discipline, and professional ethics for academic researches

(2) Having detailed knowledge and critical understanding of theories, key concepts, principles and research in Anatomy and Structural Biology

(3) Having the ability to analyze problems in Anatomy and Structural Biology, effectively conduct research and critically apply or integrate the knowledge to solve anatomy and structural biology related problems

(4) Having teamwork skills, good interpersonal, co-operator, leaderships, and responsibility

(5) Having essential skills in mathematics and statistics for research analyses, effective verbal and written English communication skills, and using appropriate information technology for self-directed learning and effective presentation

#### 1.3 Program Learning Outcomes (PLOs)

(1) Be honest, discipline, and punctual behaviors complying with regulations of the organizations; and maintain ethical standards in academic and research contexts

(2) Acquire up-to-date knowledge and thorough understanding of the principles and theoretical aspects of Anatomy and Structural Biology

(3) Effectively utilize research methods in the field of Anatomy and Structural Biology



(4) Search, analyze, criticize research problem in a systematic and theoretical context; design and conduct research in a well-organized format; and critically apply new knowledge in Anatomy and Structural Biology

(5) Have responsibility for themselves, group work and society, have good interpersonal relationships, and clear team roles as a team leader and member

(6) Have numerical and statistical skills for data analysis and use appropriate information technologies for self-directed learning and present research data effectively

(7) Have good verbal and written English communication skills

## 2. Plan for Development and Improvement

Plan for Development/Revision	Strategies	Evidences/Indexes
1. Development of the curriculum to meet the international standard (AUN-QA).	1.1 Annual evaluation process: following, comparing, and enhancing the curriculum to meet the international standard. 1.2 Annual evaluation of all courses based on the criterion of AUN-QA 1.3 The 5-year review cycle: re-evaluating objectives of the program and revise the program accordingly.	1.1 Report of AUN-QA self-assessment 1.2 Report of course evaluation 1.3 Report of curricular evaluation 1.4 Benchmarking report of the research output with similar programs in the world-ranked universities in Asian
2. Development of the curriculum according to stakeholders, social and job trends, needs of the country and the Office of the Higher Education Commission.	2.1 Survey for the needs of stakeholders; 2.2 The Thailand National Strategy (2561-2580); 2.3 Weak point analysis	2.1 Satisfaction report of the final year students, graduates, and employers 2.2 Meeting report of the faculty staffs and the stakeholders
3. Development of human resources empowerment	3.1 Scheduling orientation of career progression in	3.1 Report of new instructors' orientation

Plan for Development/Revision	Strategies	Evidences/Indexes
	<p>research and education to new instructors</p> <p>3.2 Faculty mentoring program</p> <p>3.3 Budgeting for facilities /fund for enhancing teaching capacity, academic services, and researches and innovation</p>	<p>and satisfactory evaluation</p> <p>3.2 Instructors' self-evaluation and students' feedback</p> <p>3.3 Number of research projects, outputs, and publications</p> <p>3.4 Number of instructors achieving promotion to a higher post</p>

## Section 3 Educational Management System, Curriculum Implementation, and Structure

### 1. Educational Management System

**1.1 System** : Two Semester Credit system. 1 Academic Year consists of 2 Regular Semesters, each with not less than 15 weeks of study

**1.2 Summer Session** : There is a 4-week Summer Semester in year 1, or as considered by the Curriculum Committee

**1.3 Credit Equivalence to Semester System** : None

### 2. Curriculum Implementation

**2.1 Teaching Schedule** Weekdays from Monday to Friday (08:00 A.M. - 4:00 P.M.)

- Semester 1                      August - December
- Semester 2                      January – May
- Summer Semester              May – July

#### 2.2 Qualifications of Prospective Students

(1) Hold a Bachelor's degree in Science or other relevant life science, biomedical, bioengineering, or any biological science, Bachelor of Nursing, or other related medical science which universities or institutes are accredited by the Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation

(2) Have cumulative GPA not less than 2.50.

(3) Have an English Proficiency Examination score as the requirement of Faculty of Graduate Studies, Mahidol University

(4) Applicant who does not meet the required criterion in items (2) and (3) may be considered for admission by the Program executive committees and the Dean of Faculty of Graduate Studies.

#### 2.3 Problems Encountered by New Students

- (1) English skills
- (2) Foundation of Anatomical Science

## 2.4 Strategies for Problem Solving/Limited Requirement in No. 2.3

Problems of New Students	Strategies for Problem Solving	Evaluation
Student's English proficiency score does not meet the minimal requirement for program admission.	Student is advised to enroll in Academic English Courses for Graduate Student (GRID courses) offered by the Graduate Studies and complete the courses within the 1st year.	Evaluation result is not presented in student's transcript.
Different knowledge background of the Foundation of Anatomical Science	Students are required to register a foundation course, SCAN 501 Anatomical Basis of Human Body as a pre-course without credit points.	Student's participation at least 80 per cent of the course contact hours is evaluated as AU (Audit)

## 2.5 Five-Year-Plan for Recruitment and Graduation of Students

Academic Year	2022	2023	2024	2025	2026
1 <sup>st</sup>	5	5	5	5	5
2 <sup>nd</sup>	-	5	5	5	5
3 <sup>rd</sup>	-	-	5	5	5
Cumulative numbers	5	10	15	15	15
Expected number of students graduated	-	-	5	5	5

## 2.6 Budget based on the plan

The budget is from Department of Anatomy, Faculty of Science, Mahidol University.

Estimated income per student	Credit	fee/unit	Total (Baht)
Registration fee			
Tuition	xx	xxxx	xxxxxx
Thesis	xx	xxxx	xxxxxx
Thesis research fee			xxxxxx
	<b>Total income per student</b>		<b>xxxxxx</b>
<b>Estimated expenses</b>			
Variable expenses per student			
College/university allocation			xxxxxx
Position allowance of thesis advisor and committee			xxxx
<b>Total variable expenses per student</b>			<b>xxxxxx</b>
<b>Fixed expenses</b>			
Staff salary			xxxxxx
Teaching payment			xxxxxx
Utility fee			xxxxxx
Material fee			xxxxxx
<b>Total Fixed expenses</b>			<b>xxxxxxx</b>
Number of students at break-even point		=	<b>5 persons</b>
Cost of students at break-even point			1,876,000.00 Baht
Expenses per student per academic year			150,080.00 Baht

2.7 Educational System : Classroom

## 2.8 Transfer of Credits, Courses and Cross University Registration (If any)

Credits transferring must be following Mahidol University's regulations on Graduate Studies. Should you have more information, [www.grad.mahidol.ac.th](http://www.grad.mahidol.ac.th)

## 3. Curriculum and Instructors

### 3.1 Curriculum

3.1.1 Number of credits (not less than) 36 credits

3.1.2 Curriculum Structure

The curriculum structure is set in compliance with Announcement of Ministry of Education on the subject of Criteria and Standards of Graduate Studies 2015, Master's Degree, Plan A2 as below :

1) Required courses	18 credits
2) Elective courses not less than	6 credits
3) Thesis	12 credits
<b>Total not less than</b>	<b>36 credits</b>

### 3.1.3 Courses in the curriculum

Credits (lecture – practice – self-study)

#### 1) Required Courses : 18 credits

SCAN 511	Structure and Function of Human Body	3(2-3-4)
วทกว ๕๑๑	โครงสร้างและหน้าที่ของร่างกายมนุษย์	
SCAN 512	Human Gross Anatomy Laboratory	2(0-4-2)
วทกว ๕๑๒	ปฏิบัติการมหกายวิภาคศาสตร์มนุษย์	
SCAN 513	Structure and Function of Cell, Tissue, and Organ	3(2-2-5)
วทกว ๕๑๓	โครงสร้างและหน้าที่ของเซลล์ เนื้อเยื่อ และอวัยวะ	
SCAN 514	Essential in Structural and Functional Neuroanatomy	3(2-2-5)
วทกว ๕๑๔	สาระสำคัญทางประสาทกายวิภาคศาสตร์เชิงโครงสร้างและหน้าที่	
SCAN 515	Human Embryology	1(1-0-2)
วทกว ๕๑๕	วิทยาเอ็มบริโอมนุษย์	
*SCAN 524	Experimental Research Techniques in Anatomy and Structural Biology	2(1-2-3)
วทกว ๕๒๔	เทคนิคการวิจัยเชิงทดลองทางกายวิภาคศาสตร์และชีววิทยาโครงสร้าง	
*SCAN 525	Research Design and Methodology	1(0-2-1)
วทกว ๕๒๕	การออกแบบและระเบียบวิธีการวิจัย	
SCAN 613	Seminar in Anatomy and Structural Biology I	1(1-0-2)
วทกว ๖๑๓	สัมมนาทางกายวิภาคศาสตร์และชีววิทยาโครงสร้าง ๑	
SCAN 614	Seminar in Anatomy and Structural Biology II	1(1-0-2)
วทกว ๖๑๔	สัมมนาทางกายวิภาคศาสตร์และชีววิทยาโครงสร้าง ๒	
SCID 518	Generic Skills in Science Research	1(1-0-2)
วทคร ๕๑๘	ทักษะทั่วไปในการวิจัยทางวิทยาศาสตร์	

\* New course

## 2) Elective Courses : not less than 6 credits

Credits (lecture – practice – self-study)

SCAN 607	Advanced Microscopy and Structural Biology	2(1-2-3)
วทกว ๖๐๗	ชีววิทยาโครงสร้างและจุลทรรศน์ขั้นสูง	
SCAN 620	Selected Topics in Cellular Neuroscience	1(1-0-2)
วทกว ๖๒๐	หัวข้อคัดสรรทางประสาทวิทยาศาสตร์ระดับเซลล์	
*SCAN 626	Modern Anatomical Imaging	1(0-2-1)
วทกว ๖๒๖	การสร้างภาพกายวิภาคศาสตร์สมัยใหม่	
SCID 500	Cell and Molecular Biology	3(3-0-6)
วทคร ๕๐๐	ชีววิทยาระดับเซลล์และโมเลกุล	
SCID 509	Separation Techniques	1(0-2-1)
วทคร ๕๐๙	เทคนิคการแยกสาร	
SCID 513	Animal Cell Culture Techniques	1(0-2-1)
วทคร ๕๑๓	เทคนิคการเพาะเลี้ยงเซลล์สัตว์	
SCID 535	Database Management for Research	1(0-2-1)
วทคร ๕๓๕	การจัดการฐานข้อมูลสำหรับงานวิจัย	

\* *New course*

In addition to elective courses mentioned above, a student may register other courses in international program offered by other faculties equivalent to graduate studies, Mahidol University or the ones offered by other universities according to the student's interest with the approval of the curriculum committee or the advisor.

## 3) Thesis

SCAN 698	Thesis	12(0-36-0)
วทกว ๖๙๘	วิทยานิพนธ์	

### 3.1.4 Research Project of the Program

Guidelines for conducting a research project are as follows:

(1) Gross/clinical anatomy and modern anatomy research related to:

1. Anatomical variations and clinical relevance
2. Tissue engineering scaffolds for medical applications

3. Modern Imaging in Anatomy and Structural Biology
  4. 3D models of human development
- (2) Neuroscience and age-associated diseases research related to:
1. Neurotoxicology
  2. Mechanism of neurodegeneration and neuroprotection and treatment of age-associated diseases by natural products
  3. Cellular and *C. elegans* models of neurodegenerative diseases
  4. Longevity and anti-aging research
- (3) Cell and molecular biology and cancer research related to
1. Mechanism of cancer growth, metastasis, and angiogenesis
  2. Cancer diagnosis: histopathology, cytology and tumour markers
  3. Cell surface receptors, molecular interactions, and target molecules
  4. Anti-cancer research: biomedical applications of natural products for drug adjuvant
  5. Rodent models for study human diseases
  6. Immunodiagnosis and vaccine development
- (4) Stem cell and developmental biology research related to:
1. Stem cell and gene therapy
  2. Tissue engineering and regenerative medicine: transplantation for the Treatment of hearing loss, and damaged nervous system
  3. Developmental and reproductive toxicology
- (5) Agriculture and aquaculture science related to:
1. Shrimp biotechnology and reproductive biology
  2. Molecular mechanisms of the adaptation of aquatic animals
  3. Host-pathogen Interaction
  4. Endocrine manipulation in shrimp and sea cucumber
  5. Biomaterial development for nanocontainer and drug delivery system

### 3.1.5 Definition of Course Codes

Four main alphabets are defined as follows:

The first two alphabets are abbreviation of the faculty offering the course.

SC (෮෦) means an abbreviation of Faculty of Science



The latter two alphabets are abbreviation of the department or the major offering the course.

AN (กฏ) means an abbreviation of Department of Anatomy

BT (ทช) means an abbreviation of Department of Biotechnology

BC (ชค) means an abbreviation of Department of Biochemistry

ID (คร) means an abbreviation of inter-departmental courses

Three digits of number are 5XX and 6XX indicate that the courses are in the graduate study level.

### 3.1.6 Study Plan

		SCAN 501 Anatomical Basis of Human Body 1(1-0-2)	
		Non-credit	
Year	Semester 1	Semester 2	
1	SCAN 511 Structure and Function of Human Body 3(3-0-6)	SCAN 514 Essential in Structural and Functional Neuroanatomy 3(2-2-5)	
	SCAN 512 Human Gross Anatomy Laboratory 2(0-4-2)	SCAN 515 Human Embryology 1(1-0-2)	
	SCAN 513 Structure and Function of Cell, Tissue, and Organ 3(2-3-4)	SCAN 524 Experimental Research Techniques in Anatomy and Structural Biology 2(1-2-3)	
	SCID 518 Generic Skills in Science Research 1(1-0-2)	SCAN 525 Research Design and Methodology 1(0-2-1)	
	Elective 2 credits	SCAN 613 Seminar in Anatomy and Structural Biology I 1(1-0-2)	
	<b>Total 11 credits</b>	Elective 3 credits	<b>Total 11 credits</b>
2	SCAN 614 Seminar in Anatomy and Structural Biology II 1(1-0-2)	SCAN 698 Thesis 3(0-9-0)	
	Elective 1 credit	Thesis proposal examination	
	SCAN 698 Thesis 3(0-9-0)		
<b>Total 5 credits</b>		<b>Total 3 credits</b>	
3	SCAN 698 Thesis 3(0-9-0)	SCAN 698 Thesis 3(0-9-0)	
	<b>Total 3 credits</b>	Thesis defence	<b>Total 3 credits</b>

### 3.1.8 Course Description

Please see Appendix A.

### 3.2 Name, I. D. Number, Title and Degree of Instructors Full time instructors of the curriculum

#### 3.2.1 Full time instructors of the curriculum (Please see Appendix B)

No.	Identification Card Number Academic position Name – Surname	Degree (Field of Study) University: Year of graduate	Department
1	XXXXXXXXXXXXXX Associate Professor Dr. Charoensri Thonabulsombat	Ph.D. (Animal Science and Reproductive Biology) Utah State University, USA.:1999 M.Sc. (Anatomy) Mahidol University: 1989 B.Sc. (Nursing) Mahidol University: 1984	Department of Anatomy, Faculty of Science, Mahidol University
2	XXXXXXXXXXXXXX Associate Professor Dr. Kanokpan Wongprasert	Ph.D. (Anatomy) Mahidol University: 2001 M.Sc. (Anatomy) Mahidol University: 1992 B.Sc. (Physical Therapy) First Class Honor Mahidol University: 1988	Department of Anatomy, Faculty of Science, Mahidol University
3	XXXXXXXXXXXXXX Associate Professor Dr. Krai Meemon	Ph.D. (Anatomy) Mahidol University: 2004 B.Sc. (Physical Therapy) First Class Honor Mahidol University: 1999	Department of Anatomy, Faculty of Science, Mahidol University
4	XXXXXXXXXXXXXX Associate Professor Dr. Kulathida Chaithirayanon	Ph.D. (Anatomy) Mahidol University: 2005 M.Sc. (Anatomy)	Department of Anatomy, Faculty of Science, Mahidol University

No.	Identification Card Number Academic position Name – Surname	Degree (Field of Study) University: Year of graduate	Department
		Mahidol University: 2000 B.Sc. (Physical Therapy) Second Class Honor Mahidol University: 1996	
5	XXXXXXXXXXXXX Associate Professor Dr. Rapeepun Vanichviriyakit	Ph.D. (Anatomy) Mahidol University: 2007 B.Sc. (Physical Therapy) Second Class Honor Srinakharinwirot University: 1998	Department of Anatomy, Faculty of Science, Mahidol University
6	XXXXXXXXXXXXX Associate Professor Dr. Somluk Asuvapongpatana	Ph.D. (Anatomy) Mahidol University: 2000 M.Sc. (Anatomy) Mahidol University: 1993 B.Sc. (Nursing) First Class Honor Mahidol University: 1991	Department of Anatomy, Faculty of Science, Mahidol University
7	XXXXXXXXXXXXX Associate Professor Dr. Wattana Weerachayanukul	Ph.D. (Anatomy) Mahidol University: 2002 M.Sc. (Anatomy) Mahidol University: 1995 B.Sc. (Physical Therapy) Second Class Honor Mahidol University: 1992	Department of Anatomy, Faculty of Science, Mahidol University
8	XXXXXXXXXXXXX Associate Professor Dr. Yotsawan Tinikul	Ph.D. (Anatomy) Mahidol University: 2008 M.Sc. (Anatomy) Chiang Mai University: 2004	Department of Anatomy, Faculty of Science, Mahidol University

No.	Identification Card Number Academic position Name – Surname	Degree (Field of Study) University: Year of graduate	Department
		B.Sc. (Zoology) Chiang Mai University: 2002	
9	XXXXXXXXXXXXX Assistant Professor Dr. Chinnawut Suriyonplengsaeng	Diploma of the Thai Board of Anatomical Pathology Thai Medical Council: 2015 M.D. Mahidol University: 2009	Department of Anatomy, Faculty of Science, Mahidol University
10	XXXXXXXXXXXXX Assistant Professor Dr. Morakot Sroyraya	Ph.D. (Anatomy and Structural Biology) Mahidol University: 2012 B.Sc. (Medical Technology), First Class Honor Thammasat University: 2006	Department of Anatomy, Faculty of Science, Mahidol University
11	XXXXXXXXXXXXX Assistant Professor Dr. Nopporn Jongkamonwiwat	Ph.D. (Neuroscience) Mahidol University: 2004 B.Sc. (Physical Therapy) Second Class Honor Srinakharinwirot University: 1997	Department of Anatomy, Faculty of Science, Mahidol University
12	XXXXXXXXXXXXX Assistant Professor Dr. Thanapong Kruangkum	Ph.D. (Anatomy and Structural Biology) Mahidol University: 2015 B.Sc. (Zoology) First Class Honor, Chiang Mai University: 2008	Department of Anatomy, Faculty of Science, Mahidol University
13	XXXXXXXXXXXXX Assistant Professor Dr. Worawit Suphamungmee	Ph.D. (Anatomy) Mahidol University: 2005 M.Sc. (Anatomy) Mahidol University: 2001 B.Sc. (Radiologic Technology)	Department of Anatomy, Faculty of Science, Mahidol University

No.	Identification Card Number Academic position Name – Surname	Degree (Field of Study) University: Year of graduate	Department
		Chiang Mai University: 1999	
14	XXXXXXXXXXXXXXXXX Lecturer Dr. Monsicha Somrit	Ph.D. (Anatomy and Structural Biology), Mahidol University: 2015 B.Sc. (Physical Therapy) Second Class Honor Chiang Mai University: 2003	Department of Anatomy, Faculty of Science, Mahidol University
15	XXXXXXXXXXXXXXXXX Lecturer Dr. Nutmethee Kruepunga	Ph.D. (Anatomy and Structural Biology) Mahidol University: 2017 B.Sc. (Biology) First Class Honor Kasetsart University: 2012	Department of Anatomy, Faculty of Science, Mahidol University
16	XXXXXXXXXXXXXXXXX Lecturer Dr. Phetcharat Phanthong	Ph.D. (Anatomy and Structural Biology) Mahidol University: 2015 B.Sc. (Biotechnology) Second Class Honor Silpakorn University: 2007	Department of Anatomy, Faculty of Science, Mahidol University

### 3.2.2 Full time Instructors

No.	Identification Card Number Academic position Name – Surname	Degree (Field of Study) University: Year of graduate	Department
1	XXXXXXXXXXXXXXXXX Assistant Professor Dr. Somyoth Sridurongrit	Ph.D. (Pathobiology) University of Southern California, USA: 2008 M.S. (Biochemistry and Molecular Biology)	Department of Anatomy, Faculty of Science, Mahidol University

No.	Identification Card Number Academic position Name – Surname	Degree (Field of Study) University: Year of graduate	Department
		University of Southern California, USA: 2004 B.SC. (Biochemistry) Chulalongkorn University: 1999	

#### 4. Details of Practicum (if any)

None

#### 5. Thesis requirement

**5.1 Short Description** Identify research topic in Anatomy and Structural Biology, develop research proposal related to the topic, conduct the research including research ethics, data collection, synthesis, analysis, interpretate the result and thesis report, present and publish research in proceedings or journal.

**5.2 Standard Learning Outcomes** Students are able to identify scientific research problem in the field of Anatomy and Structural Biology, design and conduct research project in a systematic and theoretical context. Students discuss with advisor to determine the topic of thesis research. Thesis output must be presented and published in proceedings or journal.

##### 5.3 Time Frame

Since semester 1 of Academic Year 2

##### 5.4 Number of credits

12 credits

##### 5.5 Preparation

- (1) Students complete all the courses stated in the curriculum
- (2) Students select a major advisor, discuss with advisor to determine the topic of research thesis proposal and take a thesis proposal examination.
- (3) Students submit the oral thesis proposal examination and committee forms to appoint the thesis title and thesis advisory committee
- (4) If thesis project involves research in human or animals, the project must be approved by institutional Animal Care and Use Committee and Biosafety committee.

##### 5.6 Evaluation Process

(1) Students must pass the proposal examination by the indicated time in the program curriculum with the approval of the program committee, and present the thesis proposal.

(2) During the thesis research process, there is an evaluation of the progress twice a year. The thesis work is evaluated by thesis committee as well as program director and reported to the Faculty of Graduate studies at the end of each semester.

(3) Students must present the thesis work in the department mini-symposium scheduled every academic year, and evaluated by the program committee.

(4) After completing the thesis, students submit a request form for thesis defence. The defence committee consists of not less than 3 persons, with one external expert acting as the chairman.

(5) Research thesis must be published at least one paper in national or international Proceedings or journals.

## Section 4 Learning Outcome, Teaching Strategies and Evaluation

## 1. Development of Students' Specific Qualifications

Special Characteristics	Teaching Strategies or Student Activities
<p>Possess characteristics according to the core values of Mahidol University.</p> <p>M = Mastery A = Altruism H = Harmony I = Integrity D = Determination O = Originality L = Leadership</p> <p>1. Self-driven lifelong learning with inquiry mind and science (Mahidol core value “Mastery” and “Determination”)</p> <p>2. Personal accountability and community awareness (Mahidol core value “Altruism” and “Integrity”)</p> <p>3. Teamwork skill and responsibility (Mahidol core value “Harmony” and “Leadership”)</p>	<p><b>Extra-curricular activities</b></p> <ol style="list-style-type: none"> <li>1. Mini-symposium: Thesis research progression (Semester 2, every year after proposal exam)</li> <li>2. Special Seminar: Invited speakers and academic staffs, 2 times/semester</li> <li>3. Student Forum “Research knowledge sharing and discussion”, 2 times/semester</li> <li>4. Academic conference in national or international meetings (1 time/year)</li> <li>5. Outreach activities for educating students in the community or public and private agencies <ul style="list-style-type: none"> <li>- Mahidol Open House, 1 time/ year, Semester 1</li> <li>- Science Avenue, 1 time/ year, Semester 2</li> </ul> </li> <li>6. Merit making ceremony for Great Teacher, 1 time/ year, Semester 1</li> <li>7. The royal fire ceremony for Great teachers, 1 time/ year, Semester 2</li> <li>8. Freshmen welcoming ceremony and Departmental outing. 1 time/ year, Semester 1</li> <li>9. Wai Kru ceremony, 1 time/ year, Semester 1</li> <li>10. Sport day and New Year celebration, 1 time/year</li> <li>11. Commencement ceremony, 1 time/year</li> </ol>



## 2. Development of Learning Outcome in Each Objective

Expected Outcome	Teaching Strategies	Evaluation Strategies
<p><b>1. Morality and Ethics</b></p> <p>1.1 Being honest to academic terms including collecting and presenting data</p> <p>1.2 Being respect to regulation of agencies.</p> <p>1.3 Generosity and good etiquette.</p> <p>1.4 Having discipline, ethical standard in academic and research</p>	<p>1. Self-study</p> <p>2. Individual assignment</p> <p>3. Case conference</p> <p>4. Group discussion</p> <p>5. Interpolation of morality and ethics in class activities</p>	<p>1. Assessment honesty in assignment.</p> <p>2. Analysis report for the case study</p> <p>3. Self and group reflection</p> <p>4. Behavioral observation and attitude on ethical issues</p>
<p><b>2. Knowledge</b></p> <p>2.1 Having thorough and up to date knowledge in Anatomy and Structural Biology</p> <p>2.2 Understanding theories, principles and fundamental research processes in Anatomy and Structural Biology</p> <p>2.3 Conquering up to date knowledge of research in Anatomy and Structural Biology</p> <p>2.4 Being able to correlate knowledge in Anatomy and Structural Biology to other related disciplines</p>	<p>1. Lecture</p> <p>2. Laboratory practice</p> <p>3. Conference</p> <p>4. Seminar</p> <p>5. Group and individual assignment and presentation</p> <p>6. Group discussion</p>	<p>1. Formative evaluation</p> <p>2. Summative evaluation</p> <p>3. Practical assessment</p> <p>4. Quality of assignment</p> <p>5. Instructor assessment</p> <p>6. Self-assessment</p> <p>7. Thesis proposal and defence</p> <p>8. Course evaluation</p>

Expected Outcome	Teaching Strategies	Evaluation Strategies
<p><b>3. Intellectual Development</b></p> <p>3.1 Being able to search review literature, comprehend and evaluate information</p> <p>3.2 Having systematical thinking, discussing scientific data, and investigating questions or problems in Anatomy and Structural Biology</p> <p>3.3 Being able to collect, interpret, analyze, criticize scientific data, and integrate knowledge in Anatomy and Structural Biology with research appropriately</p> <p>3.4 Being able to perform knowledge transfer, summarize, and present academic knowledge in Anatomy and structural biology in a creative manner</p>	<ol style="list-style-type: none"> <li>1. Case conference</li> <li>2. Seminar</li> <li>3. Self study and individual report</li> <li>4. Oral presentation</li> <li>5. Data analysis and problem solving</li> <li>6. Comparative discussion</li> <li>7. Knowledge discussion</li> <li>8. Proposal</li> <li>9. Research thesis</li> </ol>	<ol style="list-style-type: none"> <li>1. Quality of assignment</li> <li>2. Instructor assessment</li> <li>3. Self-assessment</li> <li>4. Practical assessment</li> <li>5. Formative evaluation</li> <li>6. Summative evaluation</li> <li>7. Thesis proposal and defence</li> </ol>
<p><b>4. Interpersonal Relationship and Responsibility</b></p> <p>4.1 Having responsibility to assigned tasks for themselves, group work, and society</p> <p>4.2 Being able to contribute constructive resolution of issues in group situations</p> <p>4.3 Having team work skills either as a leader or member</p>	<ol style="list-style-type: none"> <li>1. Seminar</li> <li>2. Conference</li> <li>3. Data searching and oral presentation</li> <li>4. Laboratory practice</li> <li>5. Group activity and exercise effective leadership</li> </ol>	<ol style="list-style-type: none"> <li>1. Responsibility and management assessment</li> <li>2. Class practice assessment</li> <li>3. Activity evaluation</li> <li>4. Behavioral observation</li> <li>5. Self and group reflection</li> </ol>

Expected Outcome	Teaching Strategies	Evaluation Strategies
<p><b>5. Mathematical Analytical Thinking, Communication Skills, and Information Technology Skills</b></p> <p>5.1 Utilizing appropriate mathematics and statistics for effective analyses, and interpretation of data</p> <p>5.2 Utilizing appropriate information technologies for self-directed learning and effective presentation</p> <p>5.3 Having effective verbal and written English communication skills</p>	<ol style="list-style-type: none"> <li>1. Seminar</li> <li>2. Case conference of Mathematic analysis</li> <li>3. Data searching and Practice</li> <li>4. Group discussion</li> <li>5. Research performing</li> <li>6. Oral presentation</li> <li>7. Thesis presentation</li> </ol>	<ol style="list-style-type: none"> <li>1. Practical assessment</li> <li>2. Performance assessment</li> <li>3. Self and group reflection</li> <li>4. Proceedings</li> <li>5. Thesis proposal and defence</li> </ol>

### 3. Curriculum Mapping

Please see Appendix C.

## Section 5 Criteria for Student Evaluation

### 1. Grading System

Grading system and graduation shall be complied with the criteria stated in Regulations of Mahidol University on Graduate studies ([www.grad.mahidol.ac.th](http://www.grad.mahidol.ac.th)).

### 2. Evaluation Process for the Learning Outcome of Students

2.1 Provide the evaluating process from both students and board of curriculum committee

towards each course based on the course learning outcome.

(1) Evaluating process according to the course learning outcome.

(2) Evaluating process based on the formative and summative examination of courses,

and student evaluation

(3) For thesis research, the research progression will be reported by thesis advisor and committee. The external examiner is required as one of thesis defence committee.

2.2 Provide students' learning outcome from overall curriculum evaluation from employers'

comments, and alumni's opinion.

(1) Satisfaction assessment on teaching and learning methods, atmosphere, and facilities in order to improve the curriculum.

(2) Graduate evaluation by stakeholder, alumni, external examiner, advisor, including self-evaluation.

### 3. Graduation Requirement

(1) The duration of the study is in accordance with the study plan;

(2) Students must complete all courses as stated in the curriculum at least 24 credits of the courses and 12 credits of thesis for a total of 36 credits with a minimum cumulative GPA of 3.00;

(3) English proficiency score must meet the standard criteria according to the announcement of the Faculty of Graduate Studies;

(4) Students must participate and pass in skill development activities according to the announcement of the Faculty of Graduate Studies;

(5) Students must submit thesis and pass the thesis defence examination by following Regulations of Mahidol University on Graduate Studies. The thesis examination must be an examination open to a general audience.;

(6) Thesis or a part of thesis must have presented at an academic conference and published in the conference proceedings according to the announcement of the Faculty of Graduate Studies and Office of the Higher Education Commission or published or accepted for publication in a national or international peer-reviewed journal.

## Section 6 Faculty Development

### 1. The Orientation for New Faculty Members

(1) New faculty members have to attend an orientation and welcome by Department and Faculty staffs

(2) New faculty members have an opportunity to participate the research groups and receive guidance and suggestions by mentors

(3) The head department is required to explain concerned disciplines, curriculum, process of teaching, and assignments to the new faculty members.

(4) First orientation is required for the new faculty members to know and understand policies, philosophy of the university and faculties.

(5) To understand the process of teaching and research, the new faculty members are required to be a co-course coordinator and thesis co-advisor.

### 2. Skill and Knowledge Development for Faculty Members

#### 2.1 Skills Development in Teaching and Evaluation

(1) Allow the instructor to participate in the teaching development, evaluation, revision of the courses and curriculum implemented by the university and other organizations in both national and international levels.

(2) Provide workshops to develop skills on teaching and learning methods by information technology (IT).

#### 2.2 Other Academic and Professional Skill Development

(1) Support instructors to attend meetings, conferences, training sessions, seminars and research

(2) Enhance experiences in research development by research grant writing and participate the research networks from internal and external organizations

(3) Support instructors to participate academic services such as invited speaker in conferences, reviewer for research projects, articles and academic promotion, and invited lecturers

## Section 7 Quality Assurance

### 1. Regulatory Standard

The curriculum has employed the Standard of Graduate Programs of Study (based on Thai Qualification Framework for Higher Education (HEd3) B.E. 2558). Developing and improving the curriculum has a clear process that are:

- (1) Implement the quality assurance system of Mahidol University.
- (2) There is a Program Executive Committee supervising, giving advice and formulating policies for the course committee, as well as giving approval to teaching and learning management and course development.
- (3) There are course coordinators, together with instructors, who are responsible for course planning, tracking and collecting data for continuous improvement and development of the courses every year.
- (4) Every lesson plan is prepared, including measurement and evaluation, and skills development activities for students are organized.
- (5) There is an assessment of satisfaction towards the courses and teaching and learning methods for improvement, and there is a follow-up of the evaluation data of each course from the Course Performance report.
- (6) Program director, course coordinators, and lecturers have a meeting to plan and improve the teaching and learning of the programs in the next year.
- (7) Follow up and compile the Course Performance report, TQF5 of every course at the end of each semester, including the preparation of the Program Performance report, TQF7 every academic year.
- (8) The Program Improvement Committee performs the improvement and development of the curriculum according to the five-year improvement cycle.

### 2. Graduates

**2.1 The ultimate goal of the program is to produce qualified graduates as specified in Thai Qualification Framework for Higher Education. The graduates are expected to have the following characteristics:**

(1) Be honest, discipline, and punctual behaviors complying with regulations of the organizations; and maintain ethical standards in academic and research contexts

(2) Acquire up-to-date knowledge and thorough understanding of the principles and theoretical aspects of Anatomy and Structural Biology

(3) Effectively utilize research methods in the field of Anatomy and Structural Biology

(4) Search, analyze, criticize research problem in a systematic and theoretical context; design and conduct research in a well-organized format; and critically apply new knowledge in Anatomy and Structural Biology

(5) Effectively communicate with others, have responsibility for themselves, group work and society, good interpersonal relationships, and clear team roles as a team leader and member

(6) Have numerical and statistical skills for data analysis and use appropriate information technology for self-directed learning for analyze and present research data effectively

(7) Have effective verbal and written English communication skills

## **2.2 Work of Students and Graduates.**

Graduates who hold M.Sc. in Anatomy and Structural Biology are able to work as the following careers;

(1) Academic instructor in Anatomy and Structural Biology

(2) Researcher in Biomedical Science, and scientists in government and private institutions, International and non-governmental organizations

(3) Specialist/consultant in Anatomy and Structural Biology

## **2.3 Student and Graduate outcomes**

(1) At least one paper on thesis results must have been published or accepted for publication in a peer-reviewed international journal under the regulations on classification of academic journals for research publications by the Higher Education Commission, or

(2) At least one full paper on thesis results must have been accepted and registered for presentation in an academic conference and also for publication of a full paper in the conference proceedings with the student's name as the first author according to the announcement of the Faculty of Graduate Studies.



### 3. Students

#### 3.1 Student recruitment and admission

The program has a system for recruiting graduate students who are qualified as defined in the curriculum, to further their study in the program in coordination with the educational administration such as academic qualifications, a cumulative grade point average (GPA 2.5) or national or international research publications. Applicants must pass the English proficiency requirements including listening, speaking, and writing skills as required by the Faculty of Graduate Studies.

The program provides readiness preparation prior to enrollment for graduate students in English proficiency and basic knowledge in Biological Sciences. Students are able to register diverse courses such as English language skills from the Faculty of Graduate Studies and Anatomical basis of human body provided by the program.

#### 3.2 Supervision of academic advising, thesis counseling for graduate students to maintain the high-rate graduation as follows;

(1) Student orientation will be organized. During the orientation, study plan, program content, academic life, faculty member introduction and departmental activities will be informed.

(2) The students will also be guided by thesis advisor in study advisory, study and research plans.

(3) If there is no advisor in case of first-year students, they will temporarily be supervised by the program director.

(4) Advisory schedule of all courses will be appointed for graduate students.

(5) Academic staffs and seniors will also be provided for new students to give suggestion on self-directed study processes.

#### 3.3 Students have ready access to appeal procedure

Students can get access to appeal procedures, both informal and formal, at any step of study and thesis research activity to the Dean of the Faculty of Graduate Studies. Thereafter, the decision on any appealing issues will be assessed by the Dean of the Faculty of Graduate Studies.

## **4. Instructors**

### **4.1 New staff recruitment**

Department and Faculty recruits a new lecturer based on his/her qualifications and experiences from application forms which all applicants must hold a Ph.D. or equivalent. The selection committee evaluates all applicants by their knowledge and research abilities, English skills and information technology through academic report, publications, and presentation. The selection result is based on the academic qualifications in association with the standard of graduate programs from the Ministry of Higher Education, Science, Research and Innovation, applicants' experiences and decisions from the selection committee. A new faculty will be in 1-year probation and evaluated every 6 months.

### **4.2 Staff participation for planning, evaluating and improving curriculum**

Program committee and course instructors participate in teaching improvement by brainstorming. The meetings aim to assess and develop curriculum in order to meet the requirements from stakeholders.

### **4.3 Appointment for academic experts**

A course coordinator is able to invite a special lecturer according to his/her qualification and expertise for teaching both theory and laboratory sessions in the program. Furthermore, the course coordinator nominates an academic expert to the program director for consideration and to Faculty for approval as a special lecturer.

### **4.4 Staff development**

Staffs are encouraged to participate in the teaching development, research and academic services in both national and international levels. New staffs must attend an orientation for teaching management.

## **5. Program, Study and Student Assessment**

### **5.1 Designing and regulating the courses in accordance to the frontier knowledge**

The program develops the curriculum reaching the international standard by the following processes;

(1) Investigate, benchmark and develop the curriculum annually to meet the international standard (AUN-QA).

(2) Evaluate the overall performance of courses in the program annually.

(3) Evaluate the whole curriculum every 3–5 years.

## 5.2 Managing the systems for course instructors and teaching processes

The program manages each course by the following processes;

(1) Appoint a course coordinator who is responsible for course regulation, objectives, schedule, examination and evaluation with course instructors and coordinate with the department and Medical and Graduate Education Division of Faculty of Science.

(2) Brainstorm with all course instructors including invited instructors for writing course outline following course objectives, lesson plan and course description and also assign related supporting staffs for meetings, course evaluations and improvements.

For an interdisciplinary course, there are following processes;

1. The program director notifies students to register a course as his/her study plan.
2. The program director coordinates with course instructors for students' grades.

## 5.3 Assessing and regulating the student performance by realistic and diverse criteria

(1) Provide the evaluating processes of student performances in an individual course based on course objectives and his/her thesis following the program's study plan which are evaluated by students, course instructors and program committee at the end of semester.

(2) Provide the evaluating processes of student performances in curriculum level which are evaluated by students, stakeholders, alumni and external reviewers based on students' employments, awards and recognitions.

## 5.4 Teaching activities

The program organizes integrative teaching activities by teaching media and technology

with the following teaching methods;

- (1) Lecture
- (2) Laboratory
- (3) Assignment
- (4) Self-study
- (5) Group discussion, seminars and academic conferences

## 5.5 Curriculum performance based on Thailand Qualification Framework

- (1) Prepare the detailed curriculum following TQF.2
- (2) Prepare the detailed course description following TQF.3 before starting all courses
- (3) Prepare the course's progressed report following TQF.5 after the end of semester

(4) Prepare the curriculum's progressed report following TQF.7 after the end of academic year

(5) Assess students' performances based on knowledge standard following TQF.3

(6) Develop and improve teaching activities and strategies, and evaluate learning assessments from the past curriculum's progressed report following TQF.7

## **6. Learning Support**

The Program has invested the learning resources for students. An annual budget for adequate books, learning media, audio-visual and computer equipment is supported by the Faculty of Graduate studies and the Faculty of Science.

### **6.1 Current learning resources**

(1) The Faculty of Science provides library, computer rooms, electronic database, computer network and internet for searching information from both national and international institutes.

(2) The Faculty and the Department provide adequate laboratory rooms for teaching and research, and central instrument facilities in Anatomy and Structural Biology for staffs and students.

(3) The Program provides classrooms with adequate audio-visual equipment and learning materials such as multimedia projectors, computers, high-speed internet.

(4) The Program provides learning environment facilitates sufficient academic activities

### **6.2 Additional learning resource**

The Faculty has an evaluating committee for book and journal selection, and learning resource acquisition, including books, academic journals and learning materials as requested by students and associated by the program and course instructors. Moreover, the program is able to propose required learning materials and research equipment for budget support from both Faculty of Science, The Faculty of Graduate Studies, and Mahidol University.

### **6.3 Evaluation of learning resource sufficiency**

The Faculty surveys a sufficiency for books, academic journals and other learning materials based on the satisfactory forms and requests by students and staffs. Furthermore,

the program improves the satisfaction of learning resources according to students and staffs' evaluation.

## 7. Key Performance Indicators

The Master of Science in Anatomy and Structural Biology program, Department of Anatomy, Faculty of Science, divides key performance based on the curriculum that meets the standards of Thai Qualifications Framework following conditions: (1) the compulsory performance indicators (numbers 1-5) must achieve the goal for at least two consecutive years and (2) the total number of performance indicators must reach their goal by no less than 80 percent each year. The key performance Indicators are as follows:

Key Performance Indicators	Academic Year				
	2022	2023	2024	2025	2026
1. At least 80% of all Faculty in Charge of the program have to participate in meetings that set up plans to evaluate and revise the curriculum.	✓	✓	✓	✓	✓
2. The program must have the details of the curriculum according to TQF2 which is associated with the Thai Qualifications Framework or the standards of the program.	✓	✓	✓	✓	✓
3. The program must have course specifications and field experience specifications (if any) according to TQF3 and TQF4 before the beginning of each semester.	✓	✓	✓	✓	✓
4. Instructors must produce course reports and file experience reports (if any) according to TQF5 and TQF6 within 30 days after the end of the semester.	✓	✓	✓	✓	✓
5. Instructors must produce program reports according to TQF7 within 60 days after the end of the academic year.	✓	✓	✓	✓	✓
6. Instructors must revise the grading of students according to learning standards indicated in TQF3 and TQF4 (if any) for at least 25 percent of courses that are offered each academic year.	✓	✓	✓	✓	✓
7. Instructors must assess the development and/ or improvement of teaching methods, teaching techniques	-	✓	✓	✓	✓

Key Performance Indicators	Academic Year				
	2022	2023	2024	2025	2026
or the grading system from the evaluation results in TQF 7 of the previous year.					
8. Every new instructor (if any) has to participate in the orientation and receive adequate information on the college's teaching requirements.	✓	✓	✓	✓	✓
9. Full-time instructors must demonstrate academic and/or profession improvement at least once a year.	✓	✓	✓	✓	✓
10. The number of supporting staff (if any) who demonstrate academic and/or professional improvement by at least 50 percent each year.	✓	✓	✓	✓	✓
11. The level of satisfaction from the previous year's students and new graduates toward curriculum quality, with an average score of at least 3.5 out of 5	-	✓	✓	✓	✓
12. The level of satisfaction from employers of new graduates with an average score of at least 3.5 out of 5	-	-	✓	✓	✓

## Section 8 Evaluation and Improvement of the Curriculum Implementation

### 1. Evaluation on the Teaching Efficiency

#### (1) Evaluation of teaching strategies

1.1 Analysis from students' evaluation towards courses and instructors and evaluate strengths and weaknesses for development in teaching strategies

1.2 Evaluation of students' learning (Following TQF. 5)

1.3 Meeting for course evaluation and suggestions for teaching development

#### (2) Evaluation of instructors' skills in using teaching strategies

2.1 Analysis students' evaluation towards courses and instructors in all aspects

2.2 Investigation by course coordinators, program directors, or instructors

#### (3) Meeting for course evaluation and suggestions for teaching skill enhancement

### 2. Overall Evaluation of the Curriculum

(1) Curriculum evaluation from final year students

(2) Curriculum evaluation from graduated students or new graduates and external expertise

(3) Curriculum evaluation from stakeholders

### 3. Evaluation of Curriculum Implementation in Accordance with the Curriculum

Evaluation is made annually by the program director and curriculum committee according to the key performance indicators of TQF. 2, section 7, item 7. The criteria of curriculum revision are as follow;

“Excellent” means the program has all Key Performance Indicators.

“Good” means the program shows 80% of Key Performance Indicators,

“Fair” means the program does not cover the Key Performance Indicators

### 4. Review of the Evaluation and Plans for Improvement

(1) Collect all information, advices, and evaluations by course coordinator and report annually to program director

(2) Review and analyze all information by annual report to the head of department

(3) Meet the curriculum committee for reviewing and analyzing progressed curriculum

(4) After completion of the 3-year program, the curriculum committee revises the academic curriculum in the past 3 years according to comments and suggestions, propose the revision plan to the university within the fourth year, and submit the revised curriculum before the fifth year of current curriculum

(5) Present the improvement plan for the program