



Bachelor of Science Program
in
Biomedical Science
(International Program)

Department of Pathobiology, Faculty of Science
Mahidol University

Revised Program of Academic Year 2019



หลักสูตรวิทยาศาสตร์บัณฑิต
สาขาวิชาวิทยาศาสตร์ชีวการแพทย์
(หลักสูตรนานาชาติ)

ภาควิชาพยาธิชีววิทยา คณะวิทยาศาสตร์
มหาวิทยาลัยมหิดล

หลักสูตรปรับปรุง ปีการศึกษา ๒๕๖๒

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Degree ☒ Bachelor ☐ Master ☐ Doctoral
TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science
Department of Pathobiology

Program Specification

Bachelor of Science Program in Biomedical Science (International Program) Revised Program of Academic Year 2019

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

Section 1 General Information

1. Code and Program Title

In Thai: หลักสูตรวิทยาศาสตรบัณฑิต สาขาวิชาวิทยาศาสตร์ชีวการแพทย์ (หลักสูตรนานาชาติ)
In English: Bachelor of Science Program in Biomedical Science (International Program)

2. Degree Offered and Field of Study

In Thai Full Name: วิทยาศาสตรบัณฑิต (วิทยาศาสตร์ชีวการแพทย์)
Abbreviation: วท.บ. (วิทยาศาสตร์ชีวการแพทย์)
In English Full Name: Bachelor of Science (Biomedical Science)
Abbreviation: B.Sc. (Biomedical Science)

3. Major Subject (If Applicable) None

4. Total Credits Required

Plan A – no less than 132 credits of courses taken while studying at the Faculty of Science, Mahidol University
Plan B – no less than 81 credits of courses taken while studying at the Faculty of Science, Mahidol University and no less than 240 credits of courses taken while studying at the University of Sussex

5. Program Characteristics

5.1 Degree Level Bachelor's degree, four-year program
5.2 Type of the Program Academic program
5.3 Language English
5.4 Admission Thai and international students
5.5 Collaboration with Other Institutions The University of Sussex, United Kingdom



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5.6 Degree Offered

Plan A – one degree (B.Sc. in Biomedical Science offered by Mahidol University)

Plan B – double degree (B.Sc. in Biomedical Science offered by Mahidol University and
B.Sc. in Biomedical Science offered by the University of Sussex)

6. Record of Program Status and Approval / Endorsement

6.1 The program first started in the academic year 2014.

6.2 The program revised from the program of the academic year 2014 will start in the first semester of the academic year 2019.

6.3 The SC Faculty curriculum screening procedure committee approved the program in its meeting no. 6/2018 on December 12, 2018.

6.4 The MU curriculum screening procedure committee approved the program in its meeting no. 2/2019 on March 14, 2019.

6.5 The Deans approved the program in its meeting no. 11/2019 on June 12, 2019.

6.6 The MU council approved the program in its meeting no. 545 on June 19, 2019.

7. Expected Date for the Implementation of Program under the Thai Qualifications Register (TQR) Record

The program will be ready to publicize its quality and standards according to the National Qualifications Framework for Higher Education in Thailand in academic year 2021 (2 years after the program starts).

8. Career Opportunities after Graduation

Graduates of the Bachelor of Science Program in Biomedical Science can find employment in

8.1 Scientist or research assistant in biomedical and diagnostic clinical laboratories

8.2 Product specialist in medical instrument, biotechnology and pharmaceutical companies

8.3 Health communicator and counselor

9. Name, Surname, Academic Position, Qualifications, and Identification Number and Academic Works Published in 5 Years of the Instructors In-Charge for the Program

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Faculty of Science

Department of Pathobiology

No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Most Recent Academic Works in 5 Years
1	Mr.Niwat Kangwanrangsang National ID 310200120xxxx	Lecturer	<ul style="list-style-type: none"> - Ph.D. (Medical Science), Ehime University, Japan, 2013 - M.Sc. (Anatomy), Mahidol University, Thailand, 2004 - B.Sc. (Biology), Mahidol University, Thailand, 1998 	Bertschi NL, Voorberg-van der Wel A, Zeeman AM, Schuierer S, Nigsch F, Carbone W, Knehr J, Gupta DK, Hofman SO, van der Werff N, Nieuwenhuis I, Klooster E, Faber BW, Flannery EL, Mikolajczak SA, Chuenchob V, Shrestha B, Beibel M, Bouwmeester T, Kangwanrangsang N , Sattabongkot J, Diagana TT, Kocken CH, Roma G. Transcriptomic analysis reveals reduced transcriptional activity in the malaria parasite Plasmodium cynomolgi during progression into dormancy. Elife. 2018;7. pii: e41081.
2	Mr.Somyoth Sridurongrit National ID 310090000xxxx	Assistant Professor	<ul style="list-style-type: none"> - Ph.D. (Pathobiology), University of Southern California, USA, 2008 - M.Sc. (Biochemistry), University of Southern California, USA, 2004 - B.Sc. (Biochemistry), Chulalongkorn University, Thailand, 1999 	Sridurongrit S , Ke C, Kongphat W, Pudgerd A, Suwannasing C. Abrogation of Alk5 in hepatic stellate cells decreases hepatic fibrosis and ameliorates liver damage in mice following treatment with thioacetamide. Songklanakarin J Sci Techno. 2018;40(3):314-20.
3	Mr.Somphong Narkpinit National ID 313030023xxxx	Lecturer	- M.D., Chulalongkorn University, Thailand, 2005	Tancharoen S, Shakya P, Narkpinit S , Dararat P, Kikuchi K. Anthocyanins extracted from <i>Oryza sativa</i> L. prevent fluorouracil-induced nuclear factor- KB activation in oral mucositis: in vitro and in vivo studies. Int J Mol Sci. 2018;19 (10). pii: E2981.

Degree ☒ Bachelor ☐ Master ☐ Doctoral

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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Most Recent Academic Works in 5 Years
4	Mr.Tana Taechalertpaisarn National ID 110090000xxxx	Lecturer	- Ph.D. (Medical Parasitology), University of Melbourne, Australia, 2015 - B.Sc. (Biochemistry), Chulalongkorn University, Thailand, 2006	Kennedy AT, Schmidt CQ, Thompson JK, Weiss GE, Taechalertpaisarn T , Gilson PR, et al. Recruitment of Factor H as a novel complement evasion strategy for blood-stage <i>Plasmodium falciparum</i> infection. J Immunol. 2016;196(3):1239-48.
5	Mr.Thaned Kangsamaksin National ID 352990003xxxx	Assistant Professor	- Ph.D. (Pathobiology and Molecular Medicine), Columbia University, USA, 2011 - M.A., M.Phil. (Pathobiology and Molecular Medicine), Columbia University, USA, 2008 - B.A. (Biochemistry), Columbia University, USA, 2005	Singrang N, Kittisenachai S, Roytrakul S, Svasti J, Kangsamaksin T . NOTCH1 regulates the viability of cholangiocarcinoma cells via 14-3-3 theta. J Cell Commun Signal. 2019;13(2):245-54.

10. Study Site Location

- for year 1 and year 2: both plan A and plan B are arranged at the Faculty of Science, Salaya Campus, Phutthamonthon District, Nakhon Pathom Province
- for year 3 and year 4:
Plan A – at the Faculty of Science, Phayathai Campus, Ratchathewi District, Bangkok
Plan B – at the University of Sussex, Brighton, United Kingdom

11. External Factors and/or Development Considered in Program Planning

11.1 Economic Circumstances / Development

The curriculum is revised according to the 12th National Economic and Social Development Plan (2017-2021), especially the policies to pull the country out of the middle-income trap and to promote Thailand 4.0. In order to cope with the challenges of economic and social development dynamic, natural resource depletion, and environment crises, building human capital for science, technology, and innovation readiness is a key strategy. Consequently, the curriculum is planned to produce the science and technology personnel who are ready for any workplace.

11.2 Social and Cultural Circumstances / Development

Technological advances in communication have changed the face and the pace of the world. It provides convenience and speeds up information delivery. However, not all massive information can



be trusted. To balance two sides of the same coin, the curriculum is planned to produce fully-equipped graduates with intercultural communications, analytical skills, and creative ideas which are required as important skills for the 21st century.

12. Impacts of Factors in 11.1 and 11.2 on Curriculum Development and Related Institutional Missions

12.1 Curriculum Development

To develop the revised curriculum effectively, aforementioned changes and developments in science, technology, and the socio-economic structure must be taken into consideration. Consequently, the students must be prepared with 21st century knowledge and skills in order to be ready for change, transformation, and adaptation. The curriculum is developed under the guidelines of the Thailand Qualifications Framework (TQF), focusing on the learning areas including ethics and morality, knowledge, cognitive skills, interpersonal skills and responsibility, numerical analysis, communication, and information technology skills, and the guidelines of ASEAN University Network-Quality Assurance (AUN-QA), focusing on the expected learning outcomes.

12.2 Related Institutional Missions

The mission of Mahidol University is to excel in health, sciences, arts, and innovation with integrity for the betterment of Thai society and the benefit of mankind. Thus, the revised curriculum aims to provide outcome-based education, in order to produce graduates who are able to develop their potential of using undergraduates' knowledge and skills. The graduates are expected to acquire MU graduate attributes; i.e., T-shape breadth and depth, globally talented, socially contributing, and entrepreneurially minded (see Appendix 2.2 page 126).

13. Relations to Other Programs Offered by Other Faculties/Departments in the Institution

13.1 Courses Offered by Other Departments/Faculties

The General Education courses and some of core courses are offered by other departments in the Faculty of Science and other faculties including

credits (theory–laboratory– self-study)

13.1.1	Faculty of Environment and Resource Studies	
	ENGE 105 Integrating Health and Environment	3 (3-0-6)
13.1.2	Faculty of Liberal Arts	
	LAEN 180 English for Academic Purpose I	2 (2-0-4)
	LAEN 181 English for Academic Purpose II	2 (2-0-4)
	LAEN 282 Multilingualism and Multiculturalism	2 (2-0-4)
	LAEN 380 Academic Presentations in English	2 (2-0-4)



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13.1.3 Institute of Population and Social Research

PRPR 101 Population and Development 2 (2-0-4)

PRPR 102 Regional Studies 2 (2-0-4)

13.1.4 Faculty of Science

SCBE 102 General Biology Laboratory 1 (0-3-1)

SCBE 121 Essential Biology 1 2 (2-0-4)

SCCH 161 General Chemistry 3 (3-0-6)

SCCH 172 Organic Chemistry 3 (3-0-6)

SCCH 189 Chemistry Laboratory 1 (0-3-1)

SCMA 174 Calculus and Systems of Ordinary Differential Equations 3 (3-0-6)

SCMA 191 Statistics for Medical Sciences 2 (2-0-4)

SCPY 111 Basic Physics Laboratory 1 (0-3-1)

SCPY 180 General Physics 3 (3-0-6)

13.2 Courses Offered by Biomedical Science to Other Departments/Faculties

SCBM 102 Learning Techniques 1 (1-0-2)

SCBM 104 Proper Etiquette for Socialization 2 (2-0-4)

SCBM 121 Cell and Molecular Biology 2 (2-0-4)

SCBM 224 Biochemistry 3 (3-0-6)

SCBM 225 Laboratory in Biochemistry 1 (0-2-1)

SCBM 235 Fundamental Microbiology 2 (2-0-4)

SCPA 203 Young Blood Detective 2 (2-0-4)

13.3 Coordination

The Program Director will coordinate with other relevant programs/faculties under the Mahidol University's regulations.



Section 2 Specific Data of the Program

1. Philosophy, Rationale, and Objectives of the Program

1.1 Program Philosophy

Our primary focus is on educating the learners, as for them to attain academic achievement through learning-centered education, outcome-based education and constructivism. To become a wisdom graduate, learners combine what they have learned so far with the new knowledge, and with experiential learning activities. While the role of a lecturer in the learning process is shift from an information provider to a coach or a facilitator creating challenge-based activities.

1.2 Program Objectives

1.2.1 Program Objectives

To produce graduates who have the characteristics, knowledge and skills as follows:

- 1) integrate and apply knowledge in biomedical science and related sciences to address health-related needs
- 2) create a research project in biomedical science or related fields using appropriate scientific laboratory skills
- 3) have responsibility for society, problem solving, and creative thinking as well as self-development
- 4) display teamwork, professional ethics, and formulate ideas and products to serve social needs
- 5) have skills in interpersonal communications

1.2.2 Program–Level Learning Outcomes (PLOs):

At the end of the program, successful students will be able to:

- PLO1 Synthesize knowledge and information acquired for medical-related problems to protect and improve the health of individuals
- PLO2 Carry out laboratory-based experiments to provide information about prevention, diagnosis, and treatment of diseases in accordance with international standard methodology
- PLO3 Create an independent project in biomedical science analyzed from scientific journals and laboratory reports along with laboratory safety skills and professional code of conduct to solve medical-related problems
- PLO4 Communicate concepts of biomedical science clearly and purposefully with target audiences in English, in both written and oral forms with appropriate information technologies in an organized manner
- PLO5 Work independently and coordinate with others to achieve team goals based on roles and responsibilities of a life science researcher



2. Improvement Plan

Improvement / Modification Plan	Strategy	Evidence / Indicators
1. To revise the curriculum continuously according to social and economic changes including labor market demands	<ol style="list-style-type: none">1. Develop a new outcome-based curriculum based on stakeholders' input2. Obtain constant feedbacks on the characteristics, knowledge and skills of graduates to improve upon the curriculum	<ol style="list-style-type: none">1. TQF2, TQF3, TQF5, TQF72. Summary of stakeholders' input3. Average of satisfaction score of survey > 3.5 out of 54. Academic meeting report, employers' satisfaction survey results, students' teaching evaluation, a summary of focus group research with students, parents, and alumni
2. To ensure the quality of teaching and learning activities	<ol style="list-style-type: none">1. Enhance the faculty's teaching techniques to promote practical learning through faculty trainings and seminars2. Monitor and improve upon the faculty's teaching performance	<ol style="list-style-type: none">1. Faculty's training needs survey, and a summary of new teaching techniques deployment2. Teaching evaluation records with continuous improvement goal3. Average of teaching and learning online evaluation score > 3.5 out of 5
3. To improve students' soft skills	<ol style="list-style-type: none">1. Encourage students' participation in extracurricular activities2. Promote students' ability to communicate scientific research and knowledge in various formats of presentation3. Promote students' skills in human relations, leadership, morality and ethics	<ol style="list-style-type: none">1. The number of activity transcripts and certificates2. The number of subjects and extracurricular activities with various formats of presentation3. The number of activities with human relations, leadership, morality, and ethics <p><u>Remark</u> at least 1 activity per academic year</p>



Section 3 Educational Management System, Program Implementation, and Structure

1. Educational Management System

1.1 System

Semester system

1.2 Summer Sessions

According to Mahidol University Regulations on Diploma and Undergraduate Studies of the Year B.E. 2552-2560 and the Faculty of Science's Announcement of the Year B.E. 2553, the summer session is not compulsory. For the Faculty of Science, each course offered in the summer session must have at least 15 failing students.

1.3 Credit Equivalence Ratio (In Reference to Semester System)

None

2. Program Implementation

2.1 Academic Calendar

In regular management, the offered courses are scheduled during normal working hours (08:30 a.m. – 04:30 p.m.) on weekday (Monday – Friday). However, teaching and learning outside of normal working hour are possible with appropriate management.

Semester: 1st Semester : August-December

2nd Semester : January-May

Academic calendar is subject to change in process of approval by the University Council.

2.2 Admission Requirements

Mahidol Admission Requirements for Plan A and Plan B

2.2.1 Graduate from Mathayom Suksa 6 of Secondary Education in Thailand (M.6), or high school, or its equivalent certificate or studying in the final term of grade 12 or M. 6, or equivalent, following the admission regulation of the Office of the Higher Education Commission and/or the regulation of direct admission of Mahidol University or other rules and regulations for special admission approved by Mahidol University Council

2.2.2 Qualify to be undergraduate students by passing

- (1) the university entrance process managed by the Office of the Higher Education Commission or
- (2) the direct admission process organized by the Faculty of Science and Mahidol University

2.2.3 No health or mental problems that could affect the study



The University of Sussex Admission Requirements for Plan B

B.Sc. student in Biomedical Science who would like to study at the University of Sussex to develop learning experience in the field of biomedical science in a multicultural- international environment during the third and fourth years of study has to meet the following criteria:

2.2.4 Successful completion of year 1 and 2 of the B.Sc. Biomedical Science at the Faculty of Science, Mahidol University with a cumulative grade point average of 2.8 or above in Year 2

2.2.5 An overall IELTS score of 6.5, with not less than 6.0 in each section; or a Pearson's Test of English (Academic) with 62 overall and at least 56 in all four skills. TOEFL score is not accepted for entry to the University of Sussex.

2.2.6 Successful performance at an interview by staff of both the Faculty of Science, Mahidol University and the University of Sussex

2.3 Limitations for Certain Groups of Newly Enrolled Students/ 2.4 Strategies to Resolve Students' Limitations in 2.3

Limitations of Newly Enrolled Students	Strategies to Resolve Students' Limitations
1. Students coming from various academic background may have inadequate basic knowledge for the program.	<ul style="list-style-type: none">- Organize required courses to improve background scientific knowledge and skills- Arrange extracurricular activities to enhance scientific knowledge and skills
2. Students may not have enough English skills required to study in the program.	<ul style="list-style-type: none">- Advise students with limited English skills to enroll extra English courses
3. Students may have problems adjusting to university life.	<ul style="list-style-type: none">- Organize an orientation day to introduce the program curriculum and advise how to study in the university to newly enrolled students and parents- Arrange academic advisors for the newly enrolled students to closely supervise in various aspects including study plan and university life



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2.5 A Five-Year Plan for Admission and Graduation

Academic Year	2019	2020	2021	2022	2023
First-year student	50	50	50	50	50
Second-year student	-	50	50	50	50
Third-year student	-	-	50	50	50
Fourth-year student	-	-	-	50	50
Cumulative number	50	100	150	200	200
Number of expected graduates	-	-	-	-	50

2.6 Budget Plan

Investment

Plan A

2.6.1 Breakeven/Worthiness

- Income per person/throughout the program : 558,500 baht
- Expenses per person/ throughout the program : 394,175 baht
- The smallest number of students above the breakeven point : 24
- The expected number of students : 50

2.6.2 Budget and Costs for Producing Graduates (baht per year)

1) Costs in producing graduates

No.	Costs	Baht per Year
1	Costs on personnel	2,521,000.00
	- Academic staff	1,796,000.00
	- Science project advisor	225,000.00
	- Supporting staff	180,000.00
	- Teaching assistant	270,000.00
	- Other non-academic staff	50,000.00
2	Hire, supplies and materials	1,054,000.00
	- Hire	504,000.00
	- Scientific materials and supplies	350,000.00
	- General supplies	200,000.00
3	Public utilities	155,000.00
	- Water	15,000.00
	- Electricity	120,000.00
	- Internet	20,000.00



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No.	Costs	Baht per Year
4	Depreciation - Teaching & laboratory room - Teaching equipment - Laboratory equipment	670,000.00 80,000.00 80,000.00 510,000.00
5	Subsidy (calculated from expected number of students = 50) - Mahidol University - Faculty of Science, Mahidol University	8,423,000.00 2,591,000.00 5,832,000.00
6	Others - Award for students	200,000.00
	Total	13,023,000.00

2) Income from tuition fee and others

No.	Incomes	Bath/year/program
1	Tuition fee / course credits (calculated from expected number of students = 50)	25,910,000.00
2	Outsource fund or income that supports the program	00.00
3	Others	00.00
	Total	25,910,000.00

Plan B

As the students in Plan B will share the class with students in Plan A during the first- and second-year of study at the Faculty of Science, Mahidol University, so the budget and cost are equivalent. The students who will study at the University of Sussex will have to pay for approximately 17,000 GBP per year for tuition fee.

2.7 Academic System

Plan A Plan B

- | | | |
|-------------------------------------|-------------------------------------|--|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | In Class |
| <input type="checkbox"/> | <input type="checkbox"/> | Distance Learning Mainly through Printed Materials |
| <input type="checkbox"/> | <input type="checkbox"/> | Distance Learning Mainly through Broadcast Media |
| <input type="checkbox"/> | <input type="checkbox"/> | Distance Learning Mainly through Electronic Media (E-learning) |
| <input type="checkbox"/> | <input type="checkbox"/> | Distance Learning through the Internet |
| <input type="checkbox"/> | <input type="checkbox"/> | Others (please specify) |

2.8 Credit Transfer and Cross-Institutional Enrollment (if any)



According to Mahidol University Regulations on Diploma and Undergraduate Studies of the Year B.E. 2552-2560 and MOU with the University of Sussex

3. Program and Faculty Members

3.1 Program

3.1.1 Number of Credits

For Plan A: The required number of credits in total must not be less than 132 credits of courses taken while studying at Mahidol University.

For Plan B: The required number of credits in total must not be less than 81 credits of courses taken while studying at Mahidol University and no less than 240 credits of courses taken while studying at the University of Sussex (equivalent to 48 Mahidol University credits).

3.1.2 Program Structure of the Bachelor of Science Program in Biomedical Science (International Program) complies with the Standard of Undergraduate Programs of Study announced by the Ministry of Education 2015.

Course Category	Standard Guideline of the Ministry of Education for the Undergraduate Level of Education of the Year 2015 (4-Year Program) (credits)	Plan A (credits)	Plan B (credits)
1. General Education Courses 1) Social Sciences and Humanities 2) Languages 3) Science and Mathematics 4) Health and Recreation	no less than 30	30 ^a	30 ^a
2. Specific Courses 1) Core Courses 2) Major Required Courses 3) Major Elective Courses (Module)	no less than 72	96 19 67 10	45 ^b +240 ^c 19 ^b +0 ^c 26 ^b +150 ^c 0 ^b +90 ^c
3. Free Elective Courses	no less than 6	6	6
Total Credits	no less than 120	132	81 ^b +240 ^c

^a Students have to complete the General Education courses. Students may choose the General Education courses provided by other programs/departments/faculties to fulfill the credit requirement.

^b Credits while studying at Mahidol University

^c Credits while studying at the University of Sussex

3.1.3 Courses of the Program



Courses are listed respectively in the categories: general education courses, core courses and free electives, each with course codes alphabetically listed.

In each course code, credit numbers are shown before the parentheses, and teaching hours and/or practicing hours and self-study hours are shown in the parentheses.

Course codes of the Bachelor of Science Program in Biomedical Science at the Faculty of Science, Mahidol University, consist of 7 characters: 4 letters and 3 numbers.

a. Meaning of the 4 letters:

- **The first 2 letters** are the initials of the faculty/institution in charge, namely

สว : EN indicates that the course is managed by the Faculty of Environment and Resource Studies

ศศ : LA indicates that the course is managed by the Faculty of Liberal Arts

วจ : PR indicates that the course is managed by Institute of Population and Social Research

วท : SC indicates that the course is managed by the Faculty of Science

- **The last 2 letters** are the initials of the department/program/institution/faculty in charge of teaching management.

กว : AN indicates that the course is in charged by the Department of Anatomy

ชค : BC indicates that the course is in charged by the Department of Biochemistry

ทส : BE indicates that the course is in charged by the Program of Bioresources and Environmental Biology

ชว : BI indicates that the course is in charged by the Department of Biology

ชพ : BM indicates that the course is in charged by the Program of Biomedical Science

คม : CH indicates that the course is in charged by the Department of Chemistry

กอ : EN indicates that the course is in charged by the Arts Program in English

ศท : GE indicates that the course is in charged by the Faculty of Environment and Resource Studies

คณ : MA indicates that the course is in charged by the Department of Mathematics

จช : MI indicates that the course is in charged by the Department of Microbiology

พธ : PA indicates that the course is in charged by the Department of Pathobiology

ภส : PM indicates that the course is in charged by the Department of Pharmacology

ปส : PR indicates that the course is in charged by the Institute for Population and Social Research

สธ : PS indicates that the course is in charged by the Department of Physiology

ฟส : PY indicates that the course is in charged by the Department of Physics

b. The 3 digits after the course initials



- **The first digit** indicates the year of study.
- **The second digit** indicates the field of course offered by department
 - 0 indicates interdisciplinary course or general course
 - 1 indicates courses offered by the Department of Anatomy
 - 2 indicates courses offered by the Department of Biochemistry
 - 3 indicates courses offered by the Department of Microbiology
 - 4 indicates courses offered by the Department of Pathobiology
 - 5 indicates courses offered by the Department of Pharmacology
 - 6 indicates courses offered by the Department of Physiology
 - 7 indicates interdisciplinary research-based courses
 - 9 indicates courses that achieve program assessment
- **The last digits** indicate the order of the course offered in each course category to avoid repetition.

Courses in Bachelor of Science Program in Biomedical Science

Plan A

a. General Education no less than 30 credits

Courses are selected from the following course list.

credits (theory–laboratory– self-study)

1) Social Sciences and Humanities

PRPR 101	Population and Development	2 (2-0-4)
วปส ๑๐๑	ประชากรและการพัฒนา	
PRPR 102	Regional Studies	2 (2-0-4)
วปส ๑๐๒	ภูมิภาคศึกษา	
SCBM 104	Proper Etiquette for Socialization	2 (2-0-4)
วทพ ๑๐๔	มารยาทเพื่อการเข้าสังคม	

2) Language

LAEN 180	English for Academic Purpose I	2 (2-0-4)
ศศกอ ๑๘๐	ภาษาอังกฤษเพื่อวัตถุประสงค์ทางวิชาการ ๑	
LAEN 181	English for Academic Purpose II	2 (2-0-4)
ศศกอ ๑๘๑	ภาษาอังกฤษเพื่อวัตถุประสงค์ทางวิชาการ ๒	
LAEN 282	Multilingualism and Multiculturalism	2 (2-0-4)
ศศกอ ๒๘๒	พหุภาษาและพหุวัฒนธรรม	
LAEN 380	Academic Presentations in English	2 (2-0-4)
ศศกอ ๓๘๐	การนำเสนอผลงานเป็นภาษาอังกฤษ	



	credits (theory–laboratory– self-study)
SCBM 103 Figurative Language for Everyday Life วทขพ ๑๐๓ โวหารภาพพจน์สำหรับชีวิตประจำวัน	1 (1-0-2)
3) Science and Mathematics	
ENGE 105 Integrating Health and Environment สวศท ๑๐๕ บูรณาการสุขภาพและสิ่งแวดล้อม	3 (3-0-6)
SCBC 207 Science in Social Media วทขค ๒๐๗ วิทยาศาสตร์ในสื่อสังคม	2 (2-0-4)
SCBM 101 Basic Information Literacy วทขพ ๑๐๑ การเรียนรู้สารสนเทศพื้นฐาน	1 (1-0-2)
SCBM 102 Learning Techniques วทขพ ๑๐๒ เทคนิคการเรียนรู้	1 (1-0-2)
SCPA 203 Young Blood Detective วทพธ ๒๐๓ ยอดนักสืบสายเลือดใหม่	2 (2-0-4)
4) Health and Recreation	
SCPA 204 Common Diseases in Various Age Groups วทพธ ๒๐๔ โรคทั่วไปในกลุ่มวัยต่าง ๆ	2 (2-0-4)
SCPM 203 General Principles of Drug and Herbal Usage วทภส ๒๐๓ หลักการทั่วไปของการใช้ยาและสมุนไพร	2 (2-0-4)
SCPS 101 Health and Wellness วทสร ๑๐๑ สุขภาพเพื่อการพัฒนาคุณภาพชีวิต	2 (2-0-4)

N.B. Students may choose the General Education Courses provided by other programs/departments/faculties to fulfill the credit requirement under the consent of advisor, the Program Director or Curriculum Committee in accordance with Mahidol University's regulations.

b. Specific Courses no less than 96 Credits

1) Core Courses

	credits (theory–laboratory– self-study)
SCBE 102 General Biology Laboratory 1 วทภส ๑๐๒ ปฏิบัติการชีววิทยาทั่วไป ๑	1 (0-3-1)
SCBE 121 Essential Biology 1 วทภส ๑๒๑ สารสำคัญทางชีววิทยา	2 (2-0-4)
SCCH 161 General Chemistry วทคม ๑๖๑ เคมีทั่วไป	3 (3-0-6)
SCCH 172 Organic Chemistry วทคม ๑๗๒ เคมีอินทรีย์	3 (3-0-6)



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	credits (theory–laboratory– self-study)
SCCH 189 Chemistry Laboratory	1 (0-3-1)
วทคม ๑๘๙ ปฏิบัติการเคมี	
SCMA 174 Calculus and Systems of Ordinary Differential Equations	3 (3-0-6)
วทคณ ๑๗๔ แคลคูลัสและระบบสมการเชิงอนุพันธ์สามัญ	
SCMA 191 Statistics for Medical Sciences	2 (2-0-4)
วทคณ ๑๙๑ สถิติศาสตร์สำหรับวิทยาศาสตร์การแพทย์	
SCPY 111 Basic Physics Laboratory	1 (0-3-1)
วทฟส ๑๑๑ ปฏิบัติการฟิสิกส์ขั้นพื้นฐาน	
SCPY 180 General Physics	3 (3-0-6)
วทฟส ๑๘๐ ฟิสิกส์ทั่วไป	

N.B. Students may choose the Core Courses provided by other programs/departments/faculties to fulfill the credit requirement under the consent of advisor, the Program Director or Curriculum Committee in accordance with Mahidol University's regulations.

2) Major Required Courses

SCBM 121 Cell and Molecular Biology	2 (2-0-4)
วทขพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล	
SCBM 211 Human Structure 1	3 (1-4-4)
วทขพ ๒๑๑ โครงสร้างร่างกายมนุษย์ ๑	
SCBM 212 Human Structure 2	3 (1-4-4)
วทขพ ๒๑๒ โครงสร้างร่างกายมนุษย์ ๒	
SCBM 214 Structures of Cell and Tissue	3 (2-2-5)
วทขพ ๒๑๔ โครงสร้างของเซลล์และเนื้อเยื่อ	
SCBM 224 Biochemistry	3 (3-0-6)
วทขพ ๒๒๔ ชีวเคมี	
SCBM 225 Laboratory in Biochemistry	1 (0-2-1)
วทขพ ๒๒๕ ปฏิบัติการชีวเคมี	
SCBM 233 Laboratory in Microbiology and Immunology	1 (0-2-1)
วทขพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา	
SCBM 234 Fundamental Immunology	1 (1-0-2)
วทขพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน	
SCBM 235 Fundamental Microbiology	2 (2-0-4)
วทขพ ๒๓๕ จุลชีววิทยาพื้นฐาน	

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SCBM 261	Physiology for Medical Sciences 1	2 (2-0-4)
วทขพ ๒๖๑	สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑	
SCBM 262	Physiology for Medical Sciences 2	2 (2-0-4)
วทขพ ๒๖๒	สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒	
SCBM 263	Physiology for Medical Sciences 3	3 (3-0-6)
วทขพ ๒๖๓	สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓	
SCBM 312	Medical Neuroscience	3 (2-2-5)
วทขพ ๓๑๒	ประสาทวิทยาศาสตร์การแพทย์	
SCBM 321	Medical Genetics	2 (2-0-4)
วทขพ ๓๒๑	พันธุศาสตร์การแพทย์	
SCBM 340	Basic Cellular Pathology	2 (2-0-4)
วทขพ ๓๔๐	พื้นฐานพยาธิวิทยาในระดับเซลล์	
SCBM 341	General Pathology	2 (1-2-3)
วทขพ ๓๔๑	พยาธิวิทยาพื้นฐาน	
SCBM 347	Systemic Pathology	3 (2-2-5)
วทขพ ๓๔๗	พยาธิวิทยาระบบ	
SCBM 351	Principal Actions of Therapeutic Agents	1 (1-0-2)
วทขพ ๓๕๑	หลักการออกฤทธิ์ของยา	
SCBM 352	Pharmacology 1	2 (2-0-4)
วทขพ ๓๕๒	เภสัชวิทยา ๑	
SCBM 353	Pharmacology 2	2 (2-0-4)
วทขพ ๓๕๓	เภสัชวิทยา ๒	
SCBM 371	Generic Skills in Science Research	1 (1-0-2)
วทขพ ๓๗๑	ทักษะทั่วไปในงานวิจัยทางวิทยาศาสตร์	
SCBM 372	Laboratory Exploration	1 (1-0-2)
วทขพ ๓๗๒	ห้องปฏิบัติการศึกษา	
SCBM 373	Bioinformatics	2 (2-0-4)
วทขพ ๓๗๓	ชีวสารสนเทศ	
SCBM 374	Gene Technology	1 (0-2-1)
วทขพ ๓๗๔	เทคโนโลยีด้านยีน	
SCBM 375	Microscopy and Bioimaging	2 (1-2-3)
วทขพ ๓๗๕	จุลทรรศน์ศาสตร์และภาพชีวภาพ	
SCBM 376	Cell Culture Techniques	2 (1-2-3)
วทขพ ๓๗๖	เทคนิคการเพาะเลี้ยงเซลล์	
SCBM 377	Use of Experimental Animals for Scientific Research	1 (1-0-2)
วทขพ ๓๗๗	การใช้สัตว์ทดลองเพื่องานวิจัยทางวิทยาศาสตร์	



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SCBM 490	Scientific Research Planning	4 (0-8-4)
วทชพ ๔๙๐	การวางแผนงานวิจัยทางวิทยาศาสตร์	
SCBM 491	Seminar in Biomedical Science 1	1 (1-0-2)
วทชพ ๔๙๑	สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๑	
SCBM 492	Seminar in Biomedical Science 2	1 (1-0-2)
วทชพ ๔๙๒	สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๒	
SCBM 496	Scientific Writing	2 (2-0-4)
วทชพ ๔๙๖	การเขียนงานทางวิทยาศาสตร์	
SCBM 499	Senior Project	6 (0-12-6)
วทชพ ๔๙๙	โครงงานวิจัย	

3) Major Elective Courses (Module)

Students have to select one module and registers 6 credits for semester 2 year 3 and 4 credits for semester 1 year 4.

3.1) Module A: Neuroscience

SCAN 311	Cellular and Molecular Neuroscience	3 (3-0-6)
วทกว ๓๑๑	ประสาทวิทยาศาสตร์ระดับเซลล์และโมเลกุล	
SCAN 312	Techniques in Neuroscience Research	3 (2-2-5)
วทกว ๓๑๒	เทคนิคในงานวิจัยทางประสาทวิทยาศาสตร์	
SCAN 411	Neurodegeneration and Neuroregeneration	2 (2-0-4)
วทกว ๔๑๑	การเสื่อมสภาพและการฟื้นฟูสภาพของระบบประสาท	
SCAN 412	Innovation in Clinical Neuroscience	2 (2-0-4)
วทกว ๔๑๒	นวัตกรรมของประสาทวิทยาศาสตร์เชิงคลินิก	

3.2) Module B: Cell and Molecular Medicine

SCBC 321	Molecular Aspects of Human Diseases	3 (3-0-6)
วทชค ๓๒๑	ลักษณะระดับโมเลกุลของโรคในมนุษย์	
SCBC 322	Laboratory Rotation in Cell and Molecular Medicine	3 (1-4-4)
วทชค ๓๒๒	การเวียนห้องปฏิบัติการทางเวชศาสตร์ระดับเซลล์และโมเลกุล	
SCBC 421	Frontiers in Molecular Bioscience	2 (2-0-4)
วทชค ๔๒๑	ขอบเขตความรู้สมัยใหม่ทางชีววิทยาศาสตร์โมเลกุล	
SCBC 422	Innovation in Translational Biomedicine	2 (2-0-4)
วทชค ๔๒๒	นวัตกรรมทางชีวเวชศาสตร์ปรัวรรต	

3.3) Module C: Medical Microbiology

SCMI 331	Medical Bacteriology	2 (1-2-3)
วทจช ๓๓๑	แบคทีเรียวิทยาทางการแพทย์	



			credits (theory–laboratory– self-study)
SCMI 332	Medical Mycology and Parasitology		2 (1-2-3)
วทจช ๓๓๒	วิทยาเชื้อราและปรสิตวิทยาทางการแพทย์		
SCMI 333	Medical Virology		2 (1-2-3)
วทจช ๓๓๓	ไวรัสวิทยาทางการแพทย์		
SCMI 431	Human Immune System in Health and Diseases		1 (1-0-2)
วทจช ๔๓๑	ระบบภูมิคุ้มกันของมนุษย์ในสภาวะปกติและการเกิดโรค		
SCMI 432	Current Research in Infectious Diseases		1 (1-0-2)
วทจช ๔๓๒	หัวข้อวิจัยที่ทันสมัยทางโรคติดเชื้อ		
SCPA 441	Diagnosis and Control of Infectious Diseases		2 (2-0-4)
วทพธ ๔๔๑	การวินิจฉัยและการควบคุมโรคติดต่อ		
3.4) Module D: Novel Therapeutic Strategies and Diagnosis			
SCPA 341	Cancer Biology and Novel Biomarkers		2 (2-0-4)
วทพธ ๓๔๑	ชีววิทยาโรคมะเร็งและตัวบ่งชี้ทางชีวภาพแนวใหม่		
SCPA 342	Biological Aging and Regenerative Medicine		2 (2-0-4)
วทพธ ๓๔๒	ความชราภาพทางชีววิทยาและเวชศาสตร์ฟื้นฟูชะลอวัย		
SCPA 343	Discovery of Potential Therapy in Non-Communicable Diseases		2 (2-0-4)
วทพธ ๓๔๓	การค้นพบการรักษาที่เป็นไปได้ของกลุ่มโรคไม่ติดต่อ		
SCPA 441	Diagnosis and Control of Infectious Diseases		2 (2-0-4)
วทพธ ๔๔๑	การวินิจฉัยและการควบคุมโรคติดต่อ		
SCPA 442	Novel Research on Therapeutic Strategies and Diagnosis		2 (0-4-2)
วทพธ ๔๔๒	งานวิจัยสมัยใหม่ที่เกี่ยวข้องกับกลยุทธ์ในการรักษา และวินิจฉัยโรค		
3.5) Module E: Frontiers in Drug Discovery and Therapeutic Perspectives			
SCPM 351	Clinical Pharmacology		2 (2-0-4)
วทภส ๓๕๑	เภสัชวิทยาคลินิก		
SCPM 352	Seminar in Pharmacology		2 (2-0-4)
วทภส ๓๕๒	สัมมนาทางเภสัชวิทยา		
SCPM 353	Precision Medicine		2 (2-0-4)
วทภส ๓๕๓	การแพทย์แม่นยำ		
SCPM 451	Cosmetics and Nutraceuticals		2 (1-2-3)
วทภส ๔๕๑	เครื่องสำอางและโภชนเภสัชภัณฑ์		
SCPM 452	Animal Models for Drug Testing		2 (2-0-4)
วทภส ๔๕๒	การใช้สัตว์ตัวแบบเพื่อการทดสอบยา		



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3.6) Module F: Translational Physiology

SCPS 361	Physiology of Aging	2 (2-0-4)
วทสร ๓๖๑	สรีรวิทยาของภาวะความชรา	
SCPS 362	Exercise Physiology	2 (1-2-3)
วทสร ๓๖๒	สรีรวิทยาการออกกำลังกาย	
SCPS 363	Seminar in Translational Physiology	2 (2-0-4)
วทสร ๓๖๓	สัมมนาทางสรีรวิทยาปริวรรต	
SCPS 461	Brain, Mind and Behavior	2 (2-0-4)
วทสร ๔๖๑	สมอง จิตใจ และพฤติกรรม	
SCPS 462	Trends in Translational Physiology	2 (1-2-3)
วทสร ๔๖๒	แนวโน้มทางสรีรวิทยาปริวรรต	

c. Free Elective Courses no less than 6 credits

Students can take any courses offered by Mahidol University as a free elective. There are courses offered by Program of Biomedical Science:

SCBM 201	Science of Happiness	1 (1-0-2)
วทขพ ๒๐๑	วิทยาศาสตร์แห่งความสุข	
SCBM 202	Strictly Come Ballroom Dancing	1 (0-2-1)
วทขพ ๒๐๒	เกิดมาเพื่อเต้น	

Plan B

a. General Education Courses no less than 30 credits

Students take the same General Education Courses as listed for Plan A. Students may choose the General Education Courses provided by other programs/departments/faculties to fulfill the credit requirement under the consent of advisor, the Program Director or Curriculum Committee in accordance with Mahidol University's regulations.

b. Specific Courses no less than 45+240 credits

1) Core Courses

Students take the same Core Courses as listed for Plan A (19 credits).

2) Major Required Courses

Students take the following Major Required Courses for 26 credits while studying at Mahidol University.

credits (theory–laboratory– self-study)

SCBM 121	Cell and Molecular Biology	2 (2-0-4)
วทขพ ๑๒๑	ชีววิทยาระดับเซลล์และโมเลกุล	



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	credits (theory–laboratory– self-study)
SCBM 211 Human Structure 1	3 (1-4-4)
วทขพ ๒๑๑ โครงสร้างร่างกายมนุษย์ ๑	
SCBM 212 Human Structure 2	3 (1-4-4)
วทขพ ๒๑๒ โครงสร้างร่างกายมนุษย์ ๒	
SCBM 214 Structures of Cell and Tissue	3 (2-2-5)
วทขพ ๒๑๔ โครงสร้างของเซลล์และเนื้อเยื่อ	
SCBM 224 Biochemistry	3 (3-0-6)
วทขพ ๒๒๔ ชีวเคมี	
SCBM 225 Laboratory in Biochemistry	1 (0-2-1)
วทขพ ๒๒๕ ปฏิบัติการชีวเคมี	
SCBM 234 Fundamental Immunology	1 (1-0-2)
วทขพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน	
SCBM 235 Fundamental Microbiology	2 (2-0-4)
วทขพ ๒๓๕ จุลชีววิทยาพื้นฐาน	
SCBM 233 Laboratory in Microbiology and Immunology	1 (0-2-1)
วทขพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา	
SCBM 261 Physiology for Medical Sciences 1	2 (2-0-4)
วทขพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑	
SCBM 262 Physiology for Medical Sciences 2	2 (2-0-4)
วทขพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒	
SCBM 263 Physiology for Medical Sciences 3	3 (3-0-6)
วทขพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓	

Students take the following Major Required Courses for 150 credits while studying at the University of Sussex.

	credits
C7020 Clinical Biochemistry	15
C7102 Virology	15
C7108 Cell Regulation and Cancer	15
C7110 Genetics and Genomics	15
C7114 Structural Basis of Biological Function	15
C7127 Life Sciences Year 3 Research Project (Experimental)	30
C7137 Medical Microbiology	15
C7138 Haematology and Anatomy	15
C7140 Combating Disease	15



3) Major Elective Courses

Students choose the following Major Elective Courses for 90 credits while studying at the University of Sussex.

	credits
861C1 Advanced Haematology and Transfusion Science	15
C1120 Neuronal Transduction and Transmission	15
C1121 Neuronal Plasticity and Gene Regulation	15
C7117 Innovation in Bioscience and Medicine	15
C7118 Cell Signalling and its Application in Therapeutics and Disease	15
C7120 Genomics and Bioinformatics	15
C7121 Immunology in Health and Disease	15
C7123 Molecular Genetics	15
C7124 Protein Form and Function	15
C7128 Molecular Pharmacology	15
C7129 Genome Stability, Genetic Diseases and Cancer	15
C7131 Post Transcriptional Control of Gene Expression	15
C7132 Regulating the Transcriptome	15
C7143 Structure and Function in the Brain	15
C7162 Life Sciences Year 3 Research Project (Literature)	30
C7163 Advanced Human Virology and Bacteriology	15



3.1.4 Study Plan

Plan A: 4 years at Mahidol University

Plan B: 2 years at Mahidol University continue with 2 years at the University of Sussex

	Plan A (join first 2-year courses at Mahidol University)	Plan B
Year 1	Specific Courses (Core) (20 credits) <ul style="list-style-type: none"> - General Biology (4) - General Chemistry (4) - Organic Chemistry (3) - General Physics (4) - Calculus and System of ODE (3) - Statistics (2) 	General Education Courses (30 credits) <ul style="list-style-type: none"> - Social Sciences and Humanities - Language - Science and Mathematics - Health and Recreation <p>e.g. Population and Development, Regional Studies, English for Academic Purpose, Academic Presentation in English, Multilingualism and Multiculturalism, Basic Information Literacy, Learning Techniques, Health and Wellness, Common Diseases in Various Age Group, Drug and Herbal Usage, Science in Social Media</p>
Year 2	Specific Courses (Major Required) (26 credits) <ul style="list-style-type: none"> - Cell and Molecular Biology (2) - Human Structure (6) - Structure of Cell and Tissue (3) - Biochemistry (4) - Fundamental Immunology (2) - Fundamental Microbiology (2) - Physiology for Medical Science (7) 	Free Elective Courses (6 credits) <ul style="list-style-type: none"> - Sport - Music - etc.
Year 3	Specific Courses (Major Required) (27 credits) <ul style="list-style-type: none"> - Medical Genetics (2) - Medical Neuroscience (3) - Pathology (5) - Pharmacology (5) - Generic Skills in Scientific Research (2) - Research Techniques; Bioinformatics, Cell Culture, Gene Technology, Microscopy, Experimental Animal (10) Specific Courses (Major Elective) (6 credits) <ul style="list-style-type: none"> - Courses from Module* (6) 	Specific Courses (Major Required) (120 credits) <ul style="list-style-type: none"> - Cell Regulation and Cancer (15) - Clinical Biochemistry (15) - Combating Disease (15) - Genetics and Genomics (15) - Haematology and Anatomy (15) - Medical Microbiology (15) - Structural Basis of Biological Function (15) - Virology (15)
Year 4	Specific Courses (Major Required) (14 credits) <ul style="list-style-type: none"> - Seminar in Biomedical Science (2) - Scientific Writing (2) - Scientific Research Planning (4) - Senior Project (6) Specific Courses (Major Elective) (4 credits) <ul style="list-style-type: none"> - Courses continue from the same Module* (4) <p>*one module for 10 credits</p> <p>Module A: Neuroscience Module B: Cell and Molecular Medicine Module C: Medical Microbiology Module D: Novel Therapeutic Strategies and Diagnosis Module E: Frontiers in Drug Discovery and Therapeutic Perspectives Module F: Translational Physiology</p>	Specific Courses (Major Required) (30 credits) <ul style="list-style-type: none"> - Life Sciences Year 3 Research Project (Exp.) (30) Specific Courses (Major Elective) (90 credits) <p>Choose 30 credits from</p> <ul style="list-style-type: none"> - Cell Signalling and its App in Therapeutics and Disease (15) - Immunology in Health and Disease (15) - Molecular Genetics (15) - Neuronal Transduction and Transmission (15) - Regulating the Transcriptome (15) <p>Choose 60 credits from</p> <ul style="list-style-type: none"> - Life Sciences Year 3 Research Project (Lit.) (30) - Advanced Haematology and Transfusion Science (15) - Advanced Human Virology and Bacteriology (15) - Genome Stability, Genetic Diseases and Cancer (15) - Genomics and Bioinformatics (15) - Innovation in Bioscience and Medicine (15) - Molecular Pharmacology (15) - Neuronal Plasticity and Gene Regulation (15) - Post Transcriptional Control of Gene Expression (15) - Protein Form and Function (15) - Structure and Function in the Brain (15)

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TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Year 1, Semester 1 (Plan A)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
LAEN 180 ศศภอ ๑๘๐	English for Academic Purpose I ภาษาอังกฤษเพื่อวัตถุประสงค์ทางวิชาการ ๑	2 (2-0-4)
PRPR 102 วปส ๑๐๒	Regional Studies ภูมิภาคศึกษา	2 (2-0-4)
SCBE 102 วทส ๑๐๒	General Biology Laboratory 1 ปฏิบัติการชีววิทยาทั่วไป ๑	1 (0-3-1)
SCBE 121 วทส ๑๒๑	Essential Biology 1 สาระสำคัญทางชีววิทยา	2 (2-0-4)
SCBM 101 วทชพ ๑๐๑	Basic Information Literacy การเรียนรู้สารสนเทศพื้นฐาน	1 (1-0-2)
SCBM 102 วทชพ ๑๐๒	Learning Techniques เทคนิคการเรียนรู้	1 (1-0-2)
SCCH 161 วทคม ๑๖๑	General Chemistry เคมีทั่วไป	3 (3-0-6)
SCCH 189 วทคม ๑๘๙	Chemistry Laboratory ปฏิบัติการเคมี	1 (0-3-1)
SCMA 174 วทคณ ๑๗๔	Calculus and System of Ordinary Differential Equations แคลคูลัสและระบบสมการเชิงอนุพันธ์สามัญ	3 (3-0-6)
SCPY 111 วทฟส ๑๑๑	Basic Physics Laboratory ปฏิบัติการฟิสิกส์ขั้นพื้นฐาน	1 (0-3-1)
SCPY 180 วทฟส ๑๘๐	General Physics ฟิสิกส์ทั่วไป	3 (3-0-6)
Total credits in year 1, semester 1		20

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Faculty of Science

Department of Pathobiology

Year 1, Semester 2 (Plan A)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
ENGE 105 สศท ๑๐๕	Integrating Health and Environment บูรณาการสุขภาพและสิ่งแวดล้อม	3 (3-0-6)
LAEN 181 ศศกอ ๑๘๑	English for Academic Purpose II ภาษาอังกฤษเพื่อวัตถุประสงค์ทางวิชาการ ๒	2 (2-0-4)
PRPR 101 วจปส ๑๐๑	Population and Development ประชากรและการพัฒนา	2 (2-0-4)
SCBM 103 วทชพ ๑๐๓	Figurative Language for Everyday Life โวหารภาพพจน์สำหรับชีวิตประจำวัน	1 (1-0-2)
SCBM 104 วทชพ ๑๐๔	Proper Etiquette for Socialization มารยาทเพื่อการเข้าสังคม	2 (2-0-4)
SCBM 121 วทชพ ๑๒๑	Cell and Molecular Biology ชีววิทยาระดับเซลล์และโมเลกุล	2 (2-0-4)
SCCH 172 วทคม ๑๗๒	Organic Chemistry เคมีอินทรีย์	3 (3-0-6)
SCMA 191 วทคณ ๑๙๑	Statistics for Medical Sciences สถิติศาสตร์สำหรับวิทยาศาสตร์การแพทย์	2 (2-0-4)
SCPS 101 วทสร ๑๐๑	Health and Wellness สุขภาพเพื่อการพัฒนาคุณภาพชีวิต	2 (2-0-4)
	Free Elective	2
	Total credits in year 1, semester 2	21

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Year 2, Semester 1 (Plan A)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
LAEN 380 ศศภอ ๓๘๐	Academic Presentations in English การนำเสนอผลงานเป็นภาษาอังกฤษ	2 (2-0-4)
SCBC 207 วทชค ๒๐๗	Science in Social Media วิทยาศาสตร์ในสื่อสังคม	2 (2-0-4)
SCBM 211 วทชพ ๒๑๑	Human Structure 1 โครงสร้างร่างกายมนุษย์ ๑	3 (1-4-4)
SCBM 224 วทชพ ๒๒๔	Biochemistry ชีวเคมี	3 (3-0-6)
SCBM 225 วทชพ ๒๒๕	Laboratory in Biochemistry ปฏิบัติการชีวเคมี	1 (0-2-1)
SCBM 261 วทชพ ๒๖๑	Physiology for Medical Sciences 1 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑	2 (2-0-4)
SCPA 203 วทพร ๒๐๓	Young Blood Detective ยอดนักสืบสายเลือดใหม่	2 (2-0-4)
SCPM 203 วทภส ๒๐๓	General Principles of Drug and Herbal Usage หลักการทั่วไปของการใช้ยาและสมุนไพร	2 (2-0-4)
	Free Elective	2
	Total credits in year 2, semester 1	19

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Year 2, Semester 2 (Plan A)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
LAEN 282 ศศภอ ๒๘๒	Multilingualism and Multiculturalism พหุภาษาและพหุวัฒนธรรม	2 (2-0-4)
SCBM 212 วทชพ ๒๑๒	Human Structure 2 โครงสร้างร่างกายมนุษย์ ๒	3 (1-4-4)
SCBM 214 วทชพ ๒๑๔	Structures of Cell and Tissue โครงสร้างของเซลล์และเนื้อเยื่อ	3 (2-2-5)
SCBM 233 วทชพ ๒๓๓	Laboratory in Microbiology and Immunology ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา	1 (0-2-1)
SCBM 234 วทชพ ๒๓๔	Fundamental Immunology ภูมิคุ้มกันวิทยาพื้นฐาน	1 (1-0-2)
SCBM 235 วทชพ ๒๓๕	Fundamental Microbiology จุลชีววิทยาพื้นฐาน	2 (2-0-4)
SCBM 262 วทชพ ๒๖๒	Physiology for Medical Sciences 2 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒	2 (2-0-4)
SCBM 263 วทชพ ๒๖๓	Physiology for Medical Sciences 3 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓	3 (3-0-6)
SCPA 204 วทพธ ๒๐๔	Common Diseases in Various Age Groups โรคทั่วไปในกลุ่มวัยต่าง ๆ	2 (2-0-4)
	Free Elective	2
	Total credits in year 2, semester 2	21



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Year 3, Semester 1 (Plan A)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
SCBM 321 วทชพ ๓๒๑	Medical Genetics พันธุศาสตร์การแพทย์	2 (2-0-4)
SCBM 340 วทชพ ๓๔๐	Basic Cellular Pathology พื้นฐานพยาธิวิทยาระดับเซลล์	2 (2-0-4)
SCBM 341 วทชพ ๓๔๑	General Pathology พยาธิวิทยาพื้นฐาน	2 (1-2-3)
SCBM 347 วทชพ ๓๔๗	Systemic Pathology พยาธิวิทยาระบบ	3 (2-2-5)
SCBM 351 วทชพ ๓๕๑	Principal Actions of Therapeutic Agents หลักการออกฤทธิ์ของยา	1 (1-0-2)
SCBM 352 วทชพ ๓๕๒	Pharmacology 1 เภสัชวิทยา ๑	2 (2-0-4)
SCBM 353 วทชพ ๓๕๓	Pharmacology 2 เภสัชวิทยา ๒	2 (2-0-4)
SCBM 371 วทชพ ๓๗๑	Generic Skills in Science Research ทักษะทั่วไปในงานวิจัยทางวิทยาศาสตร์	1 (1-0-2)
SCBM 372 วทชพ ๓๗๒	Laboratory Exploration ห้องปฏิบัติการการศึกษา	1 (1-0-2)
Total credits in year 3, semester 1		16



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 TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

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 Department of Pathobiology

Year 3, Semester 2 (Plan A)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
SCBM 312 วทชพ ๓๑๒	Medical Neuroscience ประสาทวิทยาศาสตร์การแพทย์	3 (2-2-5)
SCBM 373 วทชพ ๓๗๓	Bioinformatics ชีวสารสนเทศ	2 (2-0-4)
SCBM 374 วทชพ ๓๗๔	Gene Technology เทคโนโลยีด้านยีน	1 (0-2-1)
SCBM 375 วทชพ ๓๗๕	Microscopy and Bioimaging จุลทรรศน์ศาสตร์และภาพชีวภาพ	2 (1-2-3)
SCBM 376 วทชพ ๓๗๖	Cell Culture Techniques เทคนิคการเพาะเลี้ยงเซลล์	2 (1-2-3)
SCBM 377 วทชพ ๓๗๗	Use of Experimental Animals for Scientific Research การใช้สัตว์ทดลองเพื่องานวิจัยทางวิทยาศาสตร์	1 (1-0-2)
	Major Elective Courses (Module)	6
<Select 1 module for 6 credits>		
Module A: Neuroscience		
SCAN 311 วทกว ๓๑๑	Cellular and Molecular Neuroscience ประสาทวิทยาศาสตร์ระดับเซลล์และโมเลกุล	3 (3-0-6)
SCAN 312 วทกว ๓๑๒	Techniques in Neuroscience Research เทคนิคในงานวิจัยทางประสาทวิทยาศาสตร์	3 (2-2-5)
Module B: Cell and Molecular Medicine		
SCBC 321 วทชค ๓๒๑	Molecular Aspects of Human Diseases ลักษณะระดับโมเลกุลของโรคในมนุษย์	3 (3-0-6)
SCBC 322 วทชค ๓๒๒	Laboratory Rotation in Cell and Molecular Medicine การเวียนห้องปฏิบัติการทางเวชศาสตร์ระดับเซลล์และโมเลกุล	3 (1-4-4)
Module C: Medical Microbiology		
SCMI 331 วทจช ๓๓๑	Medical Bacteriology แบคทีเรียวิทยาทางการแพทย์	2 (1-2-3)
SCMI 332 วทจช ๓๓๒	Medical Mycology and Parasitology วิทยาเชื้อราและปรสิตวิทยาทางการแพทย์	2 (1-2-3)
SCMI 333 วทจช ๓๓๓	Medical Virology ไวรัสวิทยาทางการแพทย์	2 (1-2-3)
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Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
Module D: Novel Therapeutic Strategies and Diagnosis		
SCPA 341 วทพร ๓๔๑	Cancer Biology and Novel Biomarkers ชีววิทยาโรคมะเร็งและตัวบ่งชี้ทางชีวภาพแนวใหม่	2 (2-0-4)
SCPA 342 วทพร ๓๔๒	Biological Aging and Regenerative Medicine ความชราภาพทางชีววิทยาและเวชศาสตร์ฟื้นฟูชะลอวัย	2 (2-0-4)
SCPA 343 วทพร ๓๔๓	Discovery of Potential Therapy in Non-Communicable Diseases การค้นพบการรักษาที่เป็นไปได้ของกลุ่มโรคไม่ติดต่อ	2 (2-0-4)
Module E: Frontiers in Drug Discovery and Therapeutic Perspectives		
SCPM 351 วทภส ๓๕๑	Clinical Pharmacology เภสัชวิทยาคลินิก	2 (2-0-4)
SCPM 352 วทภส ๓๕๒	Seminar in Pharmacology สัมมนาทางเภสัชวิทยา	2 (2-0-4)
SCPM 353 วทภส ๓๕๓	Precision Medicine การแพทย์แม่นยำ	2 (2-0-4)
Module F: Translational Physiology		
SCPS 361 วทสร ๓๖๑	Physiology of Aging สรีรวิทยาของภาวะความชรา	2 (2-0-4)
SCPS 362 วทสร ๓๖๒	Exercise Physiology สรีรวิทยาการออกกำลังกาย	2 (1-2-3)
SCPS 363 วทสร ๓๖๓	Seminar in Translational Physiology สัมมนาทางสรีรวิทยาปริวรรต	2 (2-0-4)
Total credits in year 3, semester 2		17

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Year 4, Semester 1 (Plan A)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
SCBM 490 วทชพ ๔๙๐	Scientific Research Planning การวางแผนงานวิจัยทางวิทยาศาสตร์	4 (0-8-4)
SCBM 491 วทชพ ๔๙๑	Seminar in Biomedical Science 1 สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๑	1 (1-0-2)
Major Elective Courses (Module) – select the <u>same module</u> in Year 3 for 4 credits –		
Module A: Neuroscience		
SCAN 411 วทกว ๔๑๑	Neurodegeneration and Neuroregeneration การเสื่อมสภาพและการฟื้นฟูสภาพของระบบประสาท	2 (2-0-4)
SCAN 412 วทกว ๔๑๒	Innovation in Clinical Neuroscience นวัตกรรมของประสาทวิทยาศาสตร์เชิงคลินิก	2 (2-0-4)
Module B: Cell and Molecular Medicine		
SCBC 421 วทชค ๔๒๑	Frontiers in Molecular Bioscience ขอบเขตความรู้สมัยใหม่ทางชีววิทยาศาสตร์โมเลกุล	2 (2-0-4)
SCBC 422 วทชค ๔๒๒	Innovation in Translational Biomedicine นวัตกรรมทางชีวเวชศาสตร์ปรัวรรต	2 (2-0-4)
Module C: Medical Microbiology		
SCMI 431 วทจช ๔๓๑	Human Immune System in Health and Diseases ระบบภูมิคุ้มกันของมนุษย์ในสภาวะปกติและการเกิดโรค	1 (1-0-2)
SCMI 432 วทจช ๔๓๒	Current Research in Infectious Diseases หัวข้อวิจัยที่ทันสมัยทางโรคติดเชื้อ	1 (1-0-2)
SCPA 441 วทพร ๔๔๑	Diagnosis and Control of Infectious Diseases การวินิจฉัยและการควบคุมโรคติดต่อ	2 (2-0-4)
Module D: Novel Therapeutic Strategies and Diagnosis		
SCPA 441 วทพร ๔๔๑	Diagnosis and Control of Infectious Diseases การวินิจฉัยและการควบคุมโรคติดต่อ	2 (2-0-4)
SCPA 442 วทพร ๔๔๒	Novel Research on Therapeutic Strategies and Diagnosis งานวิจัยสมัยใหม่ที่เกี่ยวกับกลยุทธ์ในการรักษาและ วินิจฉัยโรค	2 (0-4-2)
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Course Code	Course Name	Credit(s)



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		(theory-laboratory-self-study)
Module E: Frontiers in Drug Discovery and Therapeutic Perspectives		
SCPM 451 วทส ๔๕๑	Cosmetics and Nutraceuticals เครื่องสำอางและโภชนเภสัชภัณฑ์	2 (1-2-3)
SCPM 452 วทส ๔๕๒	Animal Models for Drug Testing การใช้สัตว์ตัวแบบเพื่อการทดสอบยา	2 (2-0-4)
Module F: Translational Physiology		
SCPS 461 วทสร ๔๖๑	Brain, Mind and Behavior สมอง จิตใจ และพฤติกรรม	2 (2-0-4)
SCPS 462 วทสร ๔๖๒	Trends in Translational Physiology แนวโน้มทางสรีรวิทยาปริวรรต	2 (1-2-3)
Total credits in year 4, semester 1		9

Year 4, Semester 2 (Plan A)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
SCBM 492 วทชพ ๔๙๒	Seminar in Biomedical Science 2 สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๒	1 (1-0-2)
SCBM 496 วทชพ ๔๙๖	Scientific Writing การเขียนงานทางวิทยาศาสตร์	2 (2-0-4)
SCBM 499 วทชพ ๔๙๙	Senior Project โครงการวิจัย	6 (0-12-6)
Total credits in year 4, semester 2		9

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Year 1, Semester 1 (Plan B)

Course Code	Course Name	Credit(s)
		(theory-laboratory-self-study)
LAEN 180 ศศภอ ๑๘๐	English for Academic Purpose I ภาษาอังกฤษเพื่อวัตถุประสงค์ทางวิชาการ ๑	2 (2-0-4)
PRPR 102 วปส ๑๐๒	Regional Studies ภูมิภาคศึกษา	2 (2-0-4)
SCBE 102 วทส ๑๐๒	General Biology Laboratory 1 ปฏิบัติการชีววิทยาทั่วไป ๑	1 (0-3-1)
SCBE 121 วทส ๑๒๑	Essential Biology 1 สาระสำคัญทางชีววิทยา	2 (2-0-4)
SCBM 101 วทชพ ๑๐๑	Basic Information Literacy การเรียนรู้สารสนเทศพื้นฐาน	1 (1-0-2)
SCBM 102 วทชพ ๑๐๒	Learning Techniques เทคนิคการเรียนรู้	1 (1-0-2)
SCCH 161 วทคม ๑๖๑	General Chemistry เคมีทั่วไป	3 (3-0-6)
SCCH 189 วทคม ๑๘๙	Chemistry Laboratory ปฏิบัติการเคมี	1 (0-3-1)
SCMA 174 วทคณ ๑๗๔	Calculus and System of Ordinary Differential Equations แคลคูลัสและระบบสมการเชิงอนุพันธ์สามัญ	3 (3-0-6)
SCPY 111 วทฟส ๑๑๑	Basic Physics Laboratory ปฏิบัติการฟิสิกส์ขั้นพื้นฐาน	1 (0-3-1)
SCPY 180 วทฟส ๑๘๐	General Physics ฟิสิกส์ทั่วไป	3 (3-0-6)
Total credits in year 1, semester 1		20

Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Year 1, Semester 2 (Plan B)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
ENGE 105 สศท ๑๐๕	Integrating Health and Environment บูรณาการสุขภาพและสิ่งแวดล้อม	3 (3-0-6)
LAEN 181 ศศกอ ๑๘๑	English for Academic Purpose II ภาษาอังกฤษเพื่อวัตถุประสงค์ทางวิชาการ ๒	2 (2-0-4)
PRPR 101 วจปส ๑๐๑	Population and Development ประชากรและการพัฒนา	2 (2-0-4)
SCBM 103 วทชพ ๑๐๓	Figurative Language for Everyday Life โวหารภาพพจน์สำหรับชีวิตประจำวัน	1 (1-0-2)
SCBM 104 วทชพ ๑๐๔	Proper Etiquette for Socialization มารยาทเพื่อการเข้าสังคม	2 (2-0-4)
SCBM 121 วทชพ ๑๒๑	Cell and Molecular Biology ชีววิทยาระดับเซลล์และโมเลกุล	2 (2-0-4)
SCCH 172 วทคม ๑๗๒	Organic Chemistry เคมีอินทรีย์	3 (3-0-6)
SCMA 191 วทคณ ๑๙๑	Statistics for Medical Sciences สถิติศาสตร์สำหรับวิทยาศาสตร์การแพทย์	2 (2-0-4)
SCPS 101 วทสร ๑๐๑	Health and Wellness สุขภาพเพื่อการพัฒนาคุณภาพชีวิต	2 (2-0-4)
	Free Elective	2
	Total credits in year 1, semester 2	21



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Faculty of Science

Department of Pathobiology

Year 2, Semester 1 (Plan B)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
LAEN 380 ศศภอ ๓๘๐	Academic Presentations in English การนำเสนอผลงานเป็นภาษาอังกฤษ	2 (2-0-4)
SCBC 207 วทชค ๒๐๗	Science in Social Media วิทยาศาสตร์ในสื่อสังคม	2 (2-0-4)
SCBM 211 วทชพ ๒๑๑	Human Structure 1 โครงสร้างร่างกายมนุษย์ ๑	3 (1-4-4)
SCBM 224 วทชพ ๒๒๔	Biochemistry ชีวเคมี	3 (3-0-6)
SCBM 225 วทชพ ๒๒๕	Laboratory in Biochemistry ปฏิบัติการชีวเคมี	1 (0-2-1)
SCBM 261 วทชพ ๒๖๑	Physiology for Medical Sciences 1 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑	2 (2-0-4)
SCPA 203 วทพร ๒๐๓	Young Blood Detective ยอดนักสืบสายเลือดใหม่	2 (2-0-4)
SCPM 203 วทภส ๒๐๓	General Principles of Drug and Herbal Usage หลักการทั่วไปของการใช้ยาและสมุนไพร	2 (2-0-4)
	Free Elective	2
	Total credits in year 2, semester 1	19



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Faculty of Science

Department of Pathobiology

Year 2, Semester 2 (Plan B)

Course Code	Course Name	Credit(s) (theory-laboratory-self-study)
LAEN 282 ศศภอ ๒๘๒	Multilingualism and Multiculturalism พหุภาษาและพหุวัฒนธรรม	2 (2-0-4)
SCBM 212 วทชพ ๒๑๒	Human Structure 2 โครงสร้างร่างกายมนุษย์ ๒	3 (1-4-4)
SCBM 214 วทชพ ๒๑๔	Structures of Cell and Tissue โครงสร้างของเซลล์และเนื้อเยื่อ	3 (2-2-5)
SCBM 233 วทชพ ๒๓๓	Laboratory in Microbiology and Immunology ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา	1 (0-2-1)
SCBM 234 วทชพ ๒๓๔	Fundamental Immunology ภูมิคุ้มกันวิทยาพื้นฐาน	1 (1-0-2)
SCBM 235 วทชพ ๒๓๕	Fundamental Microbiology จุลชีววิทยาพื้นฐาน	2 (2-0-4)
SCBM 262 วทชพ ๒๖๒	Physiology for Medical Sciences 2 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒	2 (2-0-4)
SCBM 263 วทชพ ๒๖๓	Physiology for Medical Sciences 3 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓	3 (3-0-6)
SCPA 204 วทพธ ๒๐๔	Common Diseases in Various Age Groups โรคทั่วไปในกลุ่มวัยต่าง ๆ	2 (2-0-4)
	Free Elective	2
	Total credits in year 2, semester 2	21



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Department of Pathobiology

Year 3, Autumn (Plan B)

Course Code	Course Name	Credits
C7108	Cell Regulation and Cancer	15
C7110	Genetics and Genomics	15
C7114	Structural Basis of Biological Function	15
C7138	Haematology and Anatomy	15
Total credits in year 3, Autumn		60

Year 3, Spring (Plan B)

Course Code	Course Name	Credits
C7020	Clinical Biochemistry	15
C7102	Virology	15
C7137	Medical Microbiology	15
C7140	Combating Disease	15
Total credits in year 3, Spring		60



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Department of Pathobiology

Year 4, Autumn (Plan B)

Course Code	Course Name	Credits
C7127	Life Sciences Year 3 Research Project (Experimental)	30
Choose 30 credits		
C1120	Neuronal Transduction and Transmission	15
C7118	Cell Signalling and its application in Therapeutics and Disease	15
C7121	Immunology in Health and Disease	15
C7123	Molecular Genetics	15
C7132	Regulating the Transcriptome	15
C7162	Life Sciences Year 3 Research Project (Literature)	30
	Total credits in year 4, Autumn	60

Year 4, Spring (Plan B)

Course Code	Course Name	Credits
Choose 60 credits		
861C1	Advanced Haematology and Transfusion Science	15
C1121	Neuronal Plasticity and Gene Regulation	15
C7117	Innovation in Biosciences and Medicine	15
C7120	Genomics and Bioinformatics	15
C7124	Protein Form and Function	15
C7128	Molecular Pharmacology	15
C7129	Genome Stability, Genetic Diseases and Cancer	15
C7131	Post Transcriptional Control of Gene Expression	15
C7143	Structure and Function in the Brain	15
C7163	Advanced Human Virology and Bacteriology	15
	Total credits in year 4, Spring	60



3.1.5 Curriculum Mapping

(Shown in Appendix 4)

3.1.6 Course Description

a. General Education

1) Social Sciences and Humanities

credits (theory–laboratory– self-study)

PRPR 101 Population and Development

2 (2-0-4)

วจปส ๑๐๑ ประชากรและการพัฒนา

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Concepts and theories on population and development; relationships between population and development in terms of population, social and economic aspects; human resource development, education, poverty, migration, urbanization, locality, environment and resources; community participation; feminism; Greater Mekong Sub-region (GMS) development; analyzing and criticizing directions of development

แนวคิด ทฤษฎีประชากรและการพัฒนา ความสัมพันธ์ระหว่างประชากรและการพัฒนาในมิติทางประชากร สังคมและเศรษฐกิจ การพัฒนาทรัพยากรมนุษย์ การศึกษา ความยากจน การย้ายถิ่นและเป็นเมือง ท้องถิ่น สิ่งแวดล้อม และทรัพยากรธรรมชาติ การมีส่วนร่วมของชุมชน สตรีนิยม การพัฒนาอนุภูมิภาคลุ่มน้ำโขง วิเคราะห์และวิพากษ์ แนวทางการพัฒนา

PRPR 102 Regional Studies

2 (2-0-4)

วจปส ๑๐๒ ภูมิภาคศึกษา

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Development theories; international relations theories; analysis of development and trends in economics of Asian countries; regional economic integration; Greater Mekong Sub-region (GMS); ASEAN-China Free Trade Agreement (FTA); analysis of economic and socio-cultural impacts; commenting, discussing and presenting report

ทฤษฎีด้านการพัฒนา ทฤษฎีความสัมพันธ์ระหว่างประเทศ วิเคราะห์พัฒนาการและทิศทางการพัฒนาทาง เศรษฐกิจและสังคมของประเทศในเอเชีย การรวมกลุ่มทางเศรษฐกิจของภูมิภาค อนุภูมิภาคลุ่มแม่น้ำโขง ประชาคม อาเซียน เขตการค้าเสรีอาเซียน-จีน การวิเคราะห์ผลกระทบที่เกิดขึ้นในด้านเศรษฐกิจ สังคม ประชากรและวัฒนธรรม วิพากษ์ อภิปรายและนำเสนอรายงาน

SCBM 104 Proper Etiquette for Socialization

2 (2-0-4)

วทพพ ๑๐๔ มารยาทเพื่อการเข้าสังคม

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี



Basic tricks for charm creation to live appropriately in various societies; tricks about social skills: how to be good communicator, academic conference participation, table manners; tricks about personality development: skin care and cosmetics selection, suitable dress up and make up; skill improvement in daily life for socialized purposes: board game experiences, easy baking dessert; tricks about living in multi-cultural communities: the United Kingdom, France, United States, Japan

กลเม็ดเบื้องต้นในการเสริมสร้างเสน่ห์เพื่ออยู่ในสังคมในรูปแบบต่าง ๆ กลเม็ดเกี่ยวกับการเข้าสังคม เป็นนักสื่อสารที่ดีได้อย่างไร การเข้าร่วมการประชุมวิชาการ มารยาทบนโต๊ะอาหาร กลเม็ดเกี่ยวกับการเสริมสร้างบุคลิกภาพ การเลือกสกินแคร์และเครื่องสำอาง การแต่งกายและการแต่งหน้าอย่างเหมาะสม การเพิ่มพูนทักษะในชีวิตประจำวันในการเข้าสังคม ประสบการณ์การเล่นบอร์ดเกมส์ การทำขนมหวานอย่างง่าย กลเม็ดเกี่ยวกับการใช้ชีวิตในสังคมที่ประกอบด้วยหลากหลายวัฒนธรรมสหราชอาณาจักร ฝรั่งเศส สหรัฐอเมริกา ญี่ปุ่น

2) Language

LAEN 180 English for Academic Purpose I 2 (2-0-4)

ศศภอ ๑๘๐ ภาษาอังกฤษเพื่อวัตถุประสงค์ทางวิชาการ ๑

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Vocabulary, expressions, grammar, and contextualized social language; essential communicative skills in small groups; simulations in various university and academic situations; introduction to academic writing; reading and listening from various sources

คำศัพท์วิชาการ สำนวน ไวยากรณ์และภาษาที่ใช้บ่อยในบริบทสังคมวิชาการ ทักษะการสื่อสารที่จำเป็นในการสนทนากลุ่มย่อย การจำลองสถานการณ์ที่เกี่ยวข้องกับบริบทมหาวิทยาลัยและวิชาการ การเขียนเชิงวิชาการเบื้องต้น การอ่านและการฟังจากแหล่งข้อมูลต่าง ๆ

LAEN 181 English for Academic Purpose II 2 (2-0-4)

ศศภอ ๑๘๑ ภาษาอังกฤษเพื่อวัตถุประสงค์ทางวิชาการ ๒

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Essential strategies for four language skills: reading and listening from various sources, speaking in academic contexts and essay-writing, including sub-skills i.e., grammar, academic vocabulary, and summary with a focus on academic English and issues that enhance students world knowledge

กลยุทธ์ที่สำคัญในทักษะการใช้ภาษาทั้งสี่ การอ่านและการฟังตัวบททางวิชาการ การพูดในเชิงวิชาการและการเขียนระดับเรียงความ รวมทั้งทักษะย่อย คือ ไวยากรณ์ คำศัพท์วิชาการ การเขียนสรุป เน้นภาษาอังกฤษที่ใช้ในระดับอุดมศึกษาและเนื้อหาเกี่ยวกับสังคมโลก

LAEN 282 Multilingualism and Multiculturalism 2 (2-0-4)

ศศภอ ๒๘๒ พหุภาษาและพหุวัฒนธรรม

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี



The concepts of languages and cultures around the world, internationalization, and globalization; the universality and diversity in the multilingual and multicultural globe

มนทัศน์เกี่ยวกับภาษาและวัฒนธรรมต่าง ๆ รอบโลก ความเป็นนานาชาติและโลกาภิวัตน์ สากลักษณะและความหลากหลายในโลกพหุภาษาและพหุวัฒนธรรม

LAEN 380 Academic Presentations in English 2 (2-0-4)

ศศภ ๓๘๐ การนำเสนอผลงานเป็นภาษาอังกฤษ

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Presentation skills in the students' fields of study using appropriate and accurate English; clear delivery of the message; interesting and effective language use; language for statistics description; presentation strategies and research skills that enhance life-long learning

การนำเสนอผลงานในสาขาวิชาต่าง ๆ โดยใช้ภาษาอังกฤษได้อย่างถูกต้องเหมาะสม การให้ข้อมูลอย่างชัดเจน น่าสนใจและมีประสิทธิภาพ ภาษาที่ใช้ในการนำเสนอผลงาน การบรรยายข้อมูลทางสถิติ กลยุทธ์ในการนำเสนอและทักษะการวิจัยซึ่งช่วยส่งเสริมการเรียนรู้ตลอดชีวิต

SCBM 103 Figurative Language for Everyday Life 1 (1-0-2)

วทพ ๑๐๓ โวหารภาพพจน์สำหรับชีวิตประจำวัน

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

The use of a phrase or word that has different meanings from its literal meanings or that conveys meanings in fresh and unexpected ways, including metaphor, simile, euphemism, hyperbole, irony, metonymy, alliteration, anaphora, personification, apostrophe, assonance, litotes, understatement, onomatopoeia, oxymoron, paradox, synecdoche, and rhetorical question

วิธีใช้วลีหรือคำให้มีความหมายแตกต่างจากความหมายตามตัวอักษรหรือให้สื่อความหมายใหม่ในรูปแบบที่คาดไม่ถึง เช่น อุปมา ภาษาสละสลวย อติพจน์ การย่นแย้งกัน นามนัย การสัมผัสอักษร การเขียนซ้ำคำ บุคลาธิษฐาน การพูดถึงสิ่งไม่มีชีวิตว่าเป็นสิ่งมีชีวิต การกระทบสระ อุปนิเสธ คำกล่าวที่น้อยไปจากความจริง คำที่ออกเสียงเหมือนความหมาย ปฏิพจน์ ปฏิทรรศน์ อนุนามนัยและคำถามที่ไม่ต้องการคำตอบ

3) Science and Mathematics

ENGE 105 Integrating Health and Environment 3 (3-0-6)

สวศท ๑๐๕ บูรณาการสุขภาพและสิ่งแวดล้อม

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Concepts of "health" and "environment"; dimension and levels of health and factors determining health and environment; health system reform; strategic development of health and environment promotion; healthy public policy; health and environmental impact assessment;



integrative research for health and environment; indicators of well-being; information system for promoting health and environment; communication for health and environment; learning process for developing quality of life; living for health and environment; self-sufficient economy; techniques for integrating health and environment, health, environment and occupations

แนวคิดสำหรับ “สุขภาพ” และ “สิ่งแวดล้อม” มิติและระดับของสุขภาพและปัจจัยที่กำหนดสุขภาพและสิ่งแวดล้อม การปฏิรูประบบสุขภาพการพัฒนาเชิงยุทธศาสตร์สำหรับการเสริมสร้างสุขภาพและสิ่งแวดล้อม การประเมินผลกระทบทางสุขภาพและสิ่งแวดล้อม การวิจัยเชิงบูรณาการเพื่อสุขภาพ ตัวชี้วัดความอยู่ดีมีสุข ระบบสารสนเทศเพื่อเสริมสร้างสุขภาพและสิ่งแวดล้อม นโยบายสุขภาพสาธารณะ กระบวนการเรียนรู้เพื่อพัฒนาคุณภาพชีวิต การดำเนินชีวิตเพื่อสุขภาพและสิ่งแวดล้อม เศรษฐกิจพอเพียง เทคนิคการบูรณาการสุขภาพและสิ่งแวดล้อม ความสัมพันธ์ระหว่างสุขภาพและสิ่งแวดล้อมกับอาชีพ

SCBC 207 Science in Social Media

2 (2-0-4)

วทชค ๒๐๗ วิทยาศาสตร์ในสื่อสังคม

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Viral content; health supplement advertisement; herbal remedies; antioxidants in cosmetics, foods, and drinks; skin care; plastic surgery; stem cells; exercise workout; weight loss; diet pills; practicing critical thinking skills; practicing information searching skills and information technology skills for working on group assignments and doing presentations in classrooms

ข่าวที่แชร์อย่างแพร่หลายในสื่อสังคมออนไลน์ โฆษณาอาหารเสริม ยาสมุนไพร สารต้านอนุมูลอิสระในสินค้าอุปโภคบริโภค ผลิตภัณฑ์บำรุงผิว ศัลยกรรมตกแต่ง การใช้เซลล์ต้นกำเนิด การออกกำลังกายเพื่อลดน้ำหนัก ยาลดน้ำหนัก การฝึกทักษะการคิดวิเคราะห์ การฝึกทักษะการสืบค้นข้อมูลและทักษะด้านเทคโนโลยีสารสนเทศ เพื่อทำงานกลุ่มและนำเสนอในห้องเรียน

SCBM 101 Basic Information Literacy

1 (1-0-2)

วทพ ๑๐๑ การเรียนรู้สารสนเทศพื้นฐาน

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Discussions on the current status of information technology and IT devices in everyday use; using popular online tools such as E-mail and some social network tools with personal security; being aware of related the effects of law; a study of office software and cloud technology facilitating the study and the work; techniques in searching data from databases and the internet

อภิปรายความก้าวหน้าของเทคโนโลยีสารสนเทศและอุปกรณ์สื่อสารที่ใช้ในชีวิตประจำวัน การใช้สื่อสังคมออนไลน์ เช่น อีเมล ทวิตเตอร์ เฟสบุ๊ก และอื่น ๆ เพื่อการติดต่อสื่อสารทั้งในเรื่องงาน เรื่องส่วนตัวอย่างปลอดภัย ตระหนักถึงผลกระทบจากกฎหมายที่เกี่ยวข้องจากการประยุกต์ใช้ การใช้โปรแกรมสำนักงานและเทคโนโลยีคลาวด์ รวมถึงเทคนิคต่าง ๆ ในการสืบค้นฐานข้อมูลและอินเทอร์เน็ต เพื่อการศึกษาและการทำงาน



Degree ☒ Bachelor ☐ Master ☐ Doctoral
 TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science
 Department of Pathobiology

SCBM 102 Learning Techniques 1 (1-0-2)

วทขพ ๑๐๒ เทคนิคการเรียนรู้

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Group process; problem-based learning (PBL) process: PBL 1, PBL 2; mind mapping; information retrieval from textbooks, journals, and websites

กระบวนการกลุ่มเพื่อแลกเปลี่ยนความรู้กระบวนการเรียนรู้โดยใช้ปัญหาเป็นพื้นฐาน (PBL) กิจกรรมกลุ่ม PBL ครั้งที่ 1 กิจกรรมกลุ่ม PBL ครั้งที่ 2 กระบวนการเรียบเรียงความคิด การค้นหาข้อมูลจากหนังสือ วารสารวิชาการและเว็บไซต์ต่าง ๆ

SCPA 203 Young Blood Detective 2 (2-0-4)

วทพธ ๒๐๓ ยอดนักสืบสายเลือดใหม่

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Team-based learning for the basic skills of detectives including observation, data searching and collection, planning, data analysis, and knowledge synthesis; applying these skills in the circumstances such as exploration of evidences, investigation, lie detection, and case analysis

การรวมกลุ่มเพื่อฝึกทักษะพื้นฐานของนักสืบ ได้แก่ การสังเกตโดยใช้ประสาทสัมผัสทั้งห้า ทักษะการสืบค้นและรวบรวมข้อมูล การวางแผน วิเคราะห์ข้อมูล และการสังเคราะห์ความรู้ การประยุกต์ใช้ทักษะเหล่านี้ในสถานการณ์ต่าง ๆ เช่น ค้นหาหลักฐาน เฝ้าติดตามสืบ สอบเท็จ และวิเคราะห์คดี

4) Health and Recreation

SCPA 204 Common Diseases in Various Age Groups 2 (2-0-4)

วทพธ ๒๐๔ โรคทั่วไปในกลุ่มวัยต่าง ๆ

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Causes of diseases; signs and symptoms; initial diagnosis; the awareness of common diseases in various age groups: newborns, pre-teens, teenagers, adults, the elderly

สาเหตุการเกิดโรค อาการและอาการแสดง การวินิจฉัยเบื้องต้น การตระหนักถึงโรคต่าง ๆ ในกลุ่มวัยเด็กแรกเกิดและเด็กก่อน เด็กโต วัยรุ่น วัยทำงาน วัยสูงอายุ

SCPM 203 General Principles of Drug and Herbal Usage 2 (2-0-4)

วทภส ๒๐๓ หลักการทั่วไปของการใช้ยาและสมุนไพร

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Definitions of drugs, herbs, and toxicants; dosage forms; drug labeling and reading; routes of drug administration; basic principles of pharmacology for drugs and herbal medicine; drugs used in special



population; herbal plants; drugs used in animals; herbal medicine in health promotion and cosmetics; adverse drug reactions; safety and toxicity of drugs and herbs

ความหมายของยา สมุนไพรและสารพิษ รูปแบบยา การอ่านฉลากยา วิธีการให้ยา หลักการพื้นฐานทางเภสัชวิทยาของยาและยาสมุนไพร การใช้ยาในประชากรกลุ่มพิเศษ พิษสมุนไพร การใช้ยาในสัตว์ สมุนไพรในการรักษาโรคและความงาม อาการไม่พึงประสงค์ ความปลอดภัยและความเป็นพิษจากยาและสมุนไพร

SCPS 101 Health and Wellness 2 (2-0-4)

วทสร ๑๐๑ สุขภาพเพื่อการพัฒนาคุณภาพชีวิต

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Physical and spiritual factors affecting health and wellness; physical fitness and health; nutrition; physical activity; stress management; disease awareness and prevention

ปัจจัยทางกายและใจที่มีผลต่อสุขภาพและคุณภาพชีวิต สมรรถภาพทางกายและสุขภาพ โภชนาการ การออกกำลังกาย วิธีการจัดการความเครียด การระวังและการป้องกันการเกิดโรค

b. Specific Courses

1) Core Courses

SCBE 102 General Biology Laboratory 1 1 (0-3-1)

วททส ๑๐๒ ปฏิบัติการชีววิทยาทั่วไป ๑

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Microscope; movement of molecules; cells and organelles; plant tissues; animal tissues; cell division; population genetics; behavioral biology; ecology and environmental biology

กล้องจุลทรรศน์ การเคลื่อนที่ของโมเลกุล เซลล์และออร์แกเนลล์ เนื้อเยื่อพืช เนื้อเยื่อสัตว์ การแบ่งเซลล์ พันธุศาสตร์ประชากร ชีววิทยาพฤติกรรม นิเวศวิทยาและชีววิทยาสภาวะแวดล้อม

SCBE 121 Essential Biology 1 2 (2-0-4)

วททส ๑๒๑ สารสำคัญทางชีววิทยา

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Biology and its essence; variations in biological molecules and their applications; concepts of cells and tissues; investigations of growth and metabolic processes of life; factors affecting growth and survival of living things; data mining with ICT literacy from scientific database; presentation and communication in biology; genetics; pattern of inheritance; molecular genetics; recombinant DNA technology; evolution; ecology; environmental biology and conservation



ชีววิทยาและแก่นของชีววิทยา ความหลากหลายของสารชีวโมเลกุลและการนำไปใช้ประโยชน์ หลักการของเซลล์และเนื้อเยื่อ การศึกษาเรื่องการเจริญเติบโตและเมตาโบลิซึมของสิ่งมีชีวิต ปัจจัยที่เกี่ยวข้องกับการอยู่รอดของสิ่งมีชีวิต การสืบค้นข้อมูลสารสนเทศจากฐานข้อมูลทางวิทยาศาสตร์ การนำเสนอและสื่อสารข้อมูลทางชีววิทยา พันธุศาสตร์ แบบแผนการถ่ายทอดลักษณะทางพันธุกรรม พันธุศาสตร์ระดับโมเลกุล เทคโนโลยีดีเอ็นเอรีคอมบิแนนท์ วิวัฒนาการนิเวศวิทยา ชีววิทยาสภาวะแวดล้อมและการอนุรักษ์

SCCH 161 General Chemistry 3 (3-0-6)

วทคม ๑๖๑ เคมีทั่วไป

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Atomic structure; chemical bonding; gases and kinetic molecular theory of gases; phase equilibria solutions and colloids; chemical thermodynamics; chemical kinetics; ionic equilibria and electrochemistry

โครงสร้างของอะตอม พันธะเคมี แก๊สและทฤษฎีจลน์โมเลกุลของแก๊ส สมดุลระหว่างวัฏภาคสารละลายและคอลลอยด์ อุณหพลศาสตร์เคมี จลนพลศาสตร์เคมี สมดุลของไอออนและไฟฟ้าเคมี

SCCH 172 Organic Chemistry 3 (3-0-6)

วทคม ๑๗๒ เคมีอินทรีย์

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Molecular structure and classification of organic compound; reactions of organic compounds; nomenclature and stereochemistry; synthesis and reactions of alkanes, cycloalkanes, alkenes, alkynes, aromatic hydrocarbons, halides, phenols, ethers, aldehydes, ketones, carboxylic acids, carboxylic acids derivatives, amines

โครงสร้างโมเลกุลและการจำแนกสารอินทรีย์ ปฏิกิริยาของสารประกอบอินทรีย์ การเรียกชื่อ และสเตอริโอเคมี การสังเคราะห์ปฏิกิริยาแอลเคน ไฮโดรแอลเคน แอลคีน แอลไคน์ อะโรมาติกไฮโดรคาร์บอน สารเฮไลด์ แอลกอฮอล์ ฟีนอล อีเทอร์ อัลดีไฮด์ คีโตน กรดคาร์บอกซิลิก อนุพันธ์กรดคาร์บอกซิลิก แอมีน

SCCH 189 Chemistry Laboratory 1 (0-3-1)

วทคม ๑๘๙ ปฏิบัติการเคมี

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Practice experimental techniques related to topics in general chemistry and basic organic chemistry

ฝึกเทคนิคการทดลองในหัวข้อที่เกี่ยวข้องกับเคมีทั่วไปและเคมีอินทรีย์เบื้องต้น



SCMA 174 Calculus and Systems of Ordinary Differential Equations 3 (3-0-6)

วทณ ๑๗๔ แคลคูลัสและระบบสมการเชิงอนุพันธ์สามัญ

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Review of calculus; chain rule and derivatives of inverse functions; derivatives of trigonometric; inverse trigonometric; exponential and logarithmic functions; implicit differentiation and related rates; applications of derivatives; antiderivatives; definite and indefinite integrals; fundamental theorems of calculus; techniques of integration; applications of integration; systems of ordinary differential equations; direction fields and phase portraits; matrix representation; stationary solutions; solutions by eigenvalue method; applications of systems of ordinary differential equations

การทบทวนแคลคูลัส หลักเกณฑ์ลูกโซ่และอนุพันธ์ของฟังก์ชันผกผัน อนุพันธ์ของฟังก์ชันตรีโกณมิติ ฟังก์ชันตรีโกณมิติผกผัน ฟังก์ชันเชิงกำลังและฟังก์ชันลอการิทึม การหาอนุพันธ์โดยปริยายและอัตราสัมพันธ์ การประยุกต์อนุพันธ์ ปริยานุพันธ์ ปริพันธ์จำกัดเขตและไม่จำกัดเขต ทฤษฎีบทหลักมูลของแคลคูลัส เทคนิคการหาปริพันธ์ การประยุกต์การหาปริพันธ์ ระบบสมการเชิงอนุพันธ์สามัญสมนามติคทางและรูปเฟส ตัวแทนเมทริกซ์ ผลเฉลยนิ่ง ผลเฉลยโดยวิธีค่าลักษณะเฉพาะ การประยุกต์ ระบบสมการเชิงอนุพันธ์สามัญ

SCMA 191 Statistics for Medical Sciences 2 (2-0-4)

วทณ ๑๙๑ สถิติศาสตร์สำหรับวิทยาศาสตร์การแพทย์

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Concepts and applications of probability and probability distributions in various events; interpretation of statistical values; descriptive statistics; sampling for good representatives of populations and its use in estimation and hypothesis testing; presentation of article or published research depending on groups of students by statistical methods

แนวคิดและการประยุกต์ความน่าจะเป็นและการแจกแจงความน่าจะเป็นกับเหตุการณ์ต่าง ๆ การตีความค่าสถิติ สถิติพรรณนา การชักตัวอย่างเพื่อให้ได้ตัวแทนที่ดีของประชากร การนำไปใช้ในการประมาณค่าและการทดสอบสมมติฐาน การนำเสนอบทความหรืองานวิจัยที่ตีพิมพ์ตามความสนใจของกลุ่มนักศึกษาโดยวิธีเชิงสถิติ

SCPY 111 Basic Physics Laboratory 1 (0-3-1)

วทฟส ๑๑๑ ปฏิบัติการฟิสิกส์ขั้นพื้นฐาน

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

Basic physics experiments relating to mechanics, thermodynamics, physical optics, electromagnetism, special theory of relativity, quantum mechanics, atomic physics, nuclear physics

การทดลองฟิสิกส์พื้นฐานที่เกี่ยวข้องกับกลศาสตร์ เทอร์โมไดนามิกส์ แสงเชิงกายภาพ แม่เหล็กไฟฟ้า ทฤษฎีสัมพันธภาพพิเศษ กลศาสตร์ควอนตัม ฟิสิกส์ของอนุภาค ฟิสิกส์นิวเคลียร์



Degree ☒ Bachelor ☐ Master ☐ Doctoral
 TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science
 Department of Pathobiology

SCPY 180 General Physics 3 (3-0-6)
 วทฟส ๑๘๐ ฟิสิกส์ทั่วไป
 Pre-requisites: No
 วิชาบังคับก่อน: ไม่มี
 Mechanics; fluid mechanics; thermodynamics; wave and optics; electromagnetism; modern physics
 กลศาสตร์ กลศาสตร์ของไหล อุณหพลศาสตร์ คลื่นและทัศนศาสตร์ ไฟฟ้าแม่เหล็ก ฟิสิกส์ยุคใหม่

2) Major Required Courses

SCBM 121 Cell and Molecular Biology 2 (2-0-4)
 วทขพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล
 Pre-requisites: No
 วิชาบังคับก่อน: ไม่มี
 Cell structure and function; chemistry of the cell; information flow in the cell; cell division and growth; cell cycle; cell differentiation; intracellular and intercellular communication; signal transduction and cell signaling
 โครงสร้างและหน้าที่ของเซลล์ เคมีระดับเซลล์ การส่งผ่านข้อมูลภายในเซลล์ การแบ่งตัวและการเติบโตของเซลล์ วัฏจักรของเซลล์ การเปลี่ยนแปลงสภาพของเซลล์ การสื่อสารภายในเซลล์และระหว่างเซลล์ การเหนี่ยวนำสัญญาณและการส่งสัญญาณของเซลล์

SCBM 211 Human Structure 1 3 (1-4-4)
 วทขพ ๒๑๑ โครงสร้างร่างกายมนุษย์ ๑
 Pre-requisites: SCBM 121 Cell and Molecular Biology
 วิชาบังคับก่อน: วทขพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล
 Embryonic development; regional human anatomy; organ/structure relationships and functions; laboratory dissections of human cadavers in the region of back, chest, head and neck, upper limbs
 พัฒนาการของเอ็มบริโอมนุษย์ กายวิภาคศาสตร์ของร่างกายมนุษย์แบบแบ่งบริเวณ การศึกษาลักษณะโครงสร้างและความสัมพันธ์ของตำแหน่งและหน้าที่ของอวัยวะต่าง ๆ การผ่าตัดร่างกายมนุษย์ในส่วนของแผ่นหลัง หน้าอก ศีรษะ และลำคอ ทรายักษ์แขน

SCBM 212 Human Structure 2 3 (1-4-4)
 วทขพ ๒๑๒ โครงสร้างร่างกายมนุษย์ ๒
 Pre-requisites: SCBM 121 Cell and Molecular Biology
 วิชาบังคับก่อน: วทขพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล
 Embryonic development; regional human anatomy; organ/structure relationships and functions; laboratory dissections of human cadavers in the region of thoracic wall and thoracic cavity, heart, lung, abdominal wall and viscerae, pelvis, inguinal, lower limbs



พัฒนาการของเอ็มบริโอมนุษย์ กายวิภาคศาสตร์ของร่างกายมนุษย์แบบแบ่งบริเวณ การศึกษาลักษณะโครงสร้างและความสัมพันธ์ของตำแหน่งและหน้าที่ของอวัยวะต่าง ๆ การผ่าตัดร่างกายมนุษย์ในส่วนของช่องอก หัวใจ ปอด ช่องท้องและอวัยวะต่าง ๆ ในช่องท้อง อังเชิงกราน ขาหนีบ รยางค์ขา

SCBM 214 Structures of Cell and Tissue 3 (2-2-5)

วทพ ๒๑๔ โครงสร้างของเซลล์และเนื้อเยื่อ

Pre-requisites: SCBM 121 Cell and Molecular Biology

วิชาบังคับก่อน: วทพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล

Structural and molecular-cellular organization; functions of epithelium, connective tissues, muscles, nervous tissues, bone, cartilage, eye, ear, the integumentary system, the circulatory system, the digestive system, the immune system, the respiratory system, the urinary system, the reproductive system, the endocrine system

โครงสร้างและการจัดเรียงของโมเลกุลในระดับเซลล์และเนื้อเยื่อ หน้าที่ของเนื้อเยื่อบุผิว เนื้อเยื่อเกี่ยวพัน กล้ามเนื้อ เนื้อเยื่อประสาท กระดูก กระดูกอ่อน ตา หู ระบบท่อหุ้มร่างกาย ระบบไหลเวียน ระบบย่อยอาหาร ระบบภูมิคุ้มกัน ระบบหายใจ ระบบขับถ่าย ระบบสืบพันธุ์ ระบบต่อมไร้ท่อ

SCBM 224 Biochemistry 3 (3-0-6)

วทพ ๒๒๔ ชีวเคมี

Pre-requisites: SCBM 121 Cell and Molecular Biology

วิชาบังคับก่อน: วทพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล

Structures and functions of biomolecules; protein folding; protein structure and functions; biocatalysis; enzyme kinetics; citric acid cycle; electron transport and oxidative phosphorylation; anabolism and catabolism of biomolecules in normal and some important pathological conditions; regulation of metabolic pathways; the flow of genetic information; gene regulation; molecular techniques with medical applications

โครงสร้างและหน้าที่ของชีวโมเลกุล การม้วนตัวของโปรตีน โครงสร้างและหน้าที่ของโปรตีน การเร่งปฏิกิริยาเคมี โดยกลไกทางชีวภาพ จลนศาสตร์ของเอนไซม์ วัฏจักรกรดซิตริก การถ่ายโอนอิเล็กตรอนและปฏิกิริยาออกซิเดทีฟฟอสโฟรีเลชัน การสร้างและการสลายชีวโมเลกุลต่าง ๆ ในสภาวะปกติและสภาวะทางพยาธิวิทยาบางชนิด การควบคุมกระบวนการเมแทบอลิซึม การถ่ายโอนข้อมูลทางพันธุกรรม การควบคุมการแสดงออกของยีน เทคนิคทางชีววิทยาระดับโมเลกุลที่เกี่ยวข้องกับการประยุกต์ทางการแพทย์

SCBM 225 Laboratory in Biochemistry 1 (0-2-1)

วทพ ๒๒๕ ปฏิบัติการชีวเคมี

Pre-requisites: SCBM 121 Cell and Molecular Biology

วิชาบังคับก่อน: วทพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล



Determination of lactate dehydrogenase enzyme activities by spectrophotometric methods; determination of cholesterol in lipoproteins; DNA isolation and PCR amplification; DNA analysis by gel electrophoresis

การวัดการทำงานของเอนไซม์แลคเตตดีไฮโดรจีเนสโดยวิธีการดูดกลืนแสง การวัดคอเลสเตอรอลในไลโปโปรตีน การแยกดีเอ็นเอและปฏิกิริยาพีซีอาร์ การวิเคราะห์ดีเอ็นเอโดยกระแสไฟฟ้า

SCBM 233 Laboratory in Microbiology and Immunology 1 (0-2-1)

วทพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา

Pre-requisites: SCBM 121 Cell and Molecular Biology

วิชาบังคับก่อน: วทพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล

Co-requisites: SCBM 234 Fundamental Immunology

SCBM 235 Fundamental Microbiology

วิชาที่ต้องเรียนพร้อมกัน: วทพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

วทพ ๒๓๕ จุลชีววิทยาพื้นฐาน

An introduction to the basic laboratory techniques in immunology and microbiology including parasites, sterile techniques, light microscopy technique; basic laboratory tests to detect microorganisms, viruses and parasites; antigen-antibody reaction testing

แนะนำเทคนิคปฏิบัติการพื้นฐานทางภูมิคุ้มกันวิทยาและจุลชีววิทยารวมถึงปรสิต เทคนิคปลอดเชื้อ เทคนิคกล้องจุลทรรศน์แบบใช้แสง การทดสอบพื้นฐานในห้องปฏิบัติการเพื่อตรวจสอบจุลชีพ ไวรัสและปรสิต การทดสอบปฏิกิริยาระหว่างแอนติเจนและแอนติบอดี

SCBM 234 Fundamental Immunology 1 (1-0-2)

วทพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

Pre-requisites: SCBM 121 Cell and Molecular Biology

วิชาบังคับก่อน: วทพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล

Basic concepts and principles of the immune response; structure and function of immune components; properties and distinction between innate and adaptive immunity; antigen and antibody interactions; immunological methods

แนวความคิดพื้นฐานและหลักการของการตอบสนองทางภูมิคุ้มกัน โครงสร้างและหน้าที่ขององค์ประกอบต่าง ๆ ในระบบภูมิคุ้มกัน คุณสมบัติและความแตกต่างระหว่างภูมิคุ้มกันแบบไม่จำเพาะและจำเพาะ ปฏิกิริยาระหว่างแอนติเจนและแอนติบอดี การทดสอบด้วยหลักการทางวิทยาภูมิคุ้มกัน

SCBM 235 Fundamental Microbiology 2 (2-0-4)

วทพ ๒๓๕ จุลชีววิทยาพื้นฐาน

Pre-requisites: SCBM 121 Cell and Molecular Biology

วิชาบังคับก่อน: วทพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล

Co-requisites: SCBM 233 Laboratory in Microbiology and Immunology



วิชาที่ต้องเรียนพร้อมกัน: วทขพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา

Characteristics and structures of microorganisms; principles of microbial growth and metabolism; microbial genetics; bacterial, fungal, viral and parasitic diseases; mechanisms of antimicrobial agents; resistance to antimicrobial agents

คุณลักษณะและโครงสร้างของจุลชีพ หลักของการเจริญเติบโตและกระบวนการเมแทบอลิซึมของจุลชีพ พันธุศาสตร์ของจุลชีพ โรคติดเชื้อแบคทีเรีย รา ไวรัส และปรสิต กลไกของยาต้านจุลชีพ การดื้อยาต้านจุลชีพ

SCBM 261 Physiology for Medical Sciences 1 2 (2-0-4)

วทขพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

Pre-requisites: SCBM 121 Cell and Molecular Biology

วิชาบังคับก่อน: วทขพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล

Functions of the nervous and muscular systems; cell physiology; membrane potential and signal transmission; the sensory and motor systems; the autonomic nervous system; the special sensory system; higher brain; the muscular system; interactions of several systems in the body in order to maintain homeostasis

หน้าที่ของระบบประสาทและกล้ามเนื้อ สรีรวิทยาของเซลล์ ความต่างศักย์เมมเบรน และถ่ายทอดสัญญาณระหว่างเซลล์ประสาท ระบบประสาทรับรู้ความรู้สึกและการเคลื่อนไหว ระบบประสาทอัตโนมัติ ระบบรับรู้ความรู้สึกพิเศษ ระบบการทำงานของสมองส่วนบน ระบบกล้ามเนื้อ การประสานงานของระบบต่าง ๆ เพื่อนำไปสู่การทรงสภาพของร่างกาย

SCBM 262 Physiology for Medical Sciences 2 2 (2-0-4)

วทขพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

Pre-requisites: SCBM 121 Cell and Molecular Biology

วิชาบังคับก่อน: วทขพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล

Co-requisites: SCBM 263 Physiology for Medical Sciences 3

วิชาที่ต้องเรียนพร้อมกัน: วทขพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓

Functions of the cardiovascular and respiratory systems; mechanisms of homeostatic regulation of circulation and respiration; common pathological examples; an integration of the systems in responses to extrinsic factors such as exercise and hemorrhagic shock to maintain homeostasis

หน้าที่ของระบบหัวใจและหลอดเลือดและระบบหายใจ กลไกการควบคุมการทรงสภาพของการไหลเวียนและการหายใจ ตัวอย่างพยาธิสภาพที่พบบ่อย การประสานงานของระบบต่าง ๆ เพื่อตอบสนองต่อปัจจัยภายนอก ได้แก่ การออกกำลังกายและภาวะช็อคจากการเสียเลือด เพื่อการทรงสภาพของร่างกาย

SCBM 263 Physiology for Medical Sciences 3 3 (3-0-6)

วทขพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓

Pre-requisites: SCBM 121 Cell and Molecular Biology

วิชาบังคับก่อน: วทขพ ๑๒๑ ชีววิทยาระดับเซลล์และโมเลกุล



Co-requisites: SCBM 262 Physiology for Medical Sciences 2

วิชาที่ต้องเรียนพร้อมกัน: วทขพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

The functions and the underlying mechanisms of the renal, gastrointestinal, endocrine, and the reproductive systems; the coordination of the systems to maintain the homeostasis of internal environment in response to disturbances from the external environment

หน้าที่และกลไกการทำงานของระบบไต ระบบทางเดินอาหาร ระบบต่อมไร้ท่อและระบบสืบพันธุ์ การทำงานประสานกันของระบบต่าง ๆ เพื่อการทรงสภาพปกติในกาย และการตอบสนองต่อการรบกวนจากภายนอก

SCBM 312 Medical Neuroscience 3 (2-2-5)

วทขพ ๓๑๒ ประสาทวิทยาศาสตร์การแพทย์

Pre-requisites: SCBM 211 Human Structure 1

วิชาบังคับก่อน: วทขพ ๒๑๑ โครงสร้างร่างกายมนุษย์ ๑

Overviews of the nervous system; the development of the nervous system; structural organization of the nervous system and spinal cord, cerebral cortex, brainstem and cranial nerves, basal ganglia and cerebellum, hypothalamus, ventricles, meninges and neurovasculature, the sensory system, the motor system, the visual system, the auditory and vestibular systems, visceral motor pathways, the limbic system

ภาพรวมของระบบประสาท พัฒนาการของระบบประสาท โครงสร้างของระบบประสาทและไขสันหลัง ซีรีบรัลคอร์เท็กซ์ ก้านสมองและเส้นประสาทสมอง เบซิลแกงเกลียและซีรีเบลลัม ไฮโปทาลามัส โพรงสมอง เยื่อหุ้มสมองและเส้นเลือดเลี้ยงสมอง ระบบการรับรู้ความรู้สึก ระบบการมองเห็น ระบบการได้ยินและการทรงตัว ระบบควบคุมการเคลื่อนไหว ระบบควบคุมการทำงานของอวัยวะภายใน ระบบลิมบิก

SCBM 321 Medical Genetics 2 (2-0-4)

วทขพ ๓๒๑ พันธุศาสตร์การแพทย์

Pre-requisites: SCBM 224 Biochemistry

วิชาบังคับก่อน: วทขพ ๒๒๔ ชีวเคมี

Fundamental concepts of genes, chromosomes, and their inheritance; features of human genome; organization, expression, and regulation of genes on chromosomes; genetic variation, polymorphism, and natural selection; types of selections and factors affecting human evolution including mutations; mapping of human genome; molecular tools for an analysis of genetic diseases; biochemical mechanism and molecular biology of genetic diseases including both single gene disorders and multifactorial disorders; carcinogenesis at the molecular level; the treatment of genetic diseases; the epidemiological study of prevention and therapy; genetic counseling and ethical conduct involving human research

ความรู้พื้นฐานเกี่ยวกับยีน โครโมโซม และการถ่ายทอดทางพันธุกรรม โครงสร้างลักษณะการเรียงตัวและการแสดงออกของยีนบนโครโมโซม ความหลากหลาย ความผันแปรและการคัดเลือกพันธุกรรมโดยธรรมชาติ ชนิดของการเลือกและปัจจัยทางวิวัฒนาการของมนุษย์ การกลายพันธุ์ของสารพันธุกรรม การทำแผนที่จีโนมของมนุษย์ เทคนิคในการ



Degree ☒ Bachelor ☐ Master ☐ Doctoral
TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science
Department of Pathobiology

วินิจฉัยโรคทางพันธุกรรมในระดับโมเลกุล กลไกการเกิดโรคทางพันธุกรรมระดับชีวเคมีและชีววิทยาระดับโมเลกุล โรคที่เกิดจากความผิดปกติของการถ่ายทอดทางพันธุกรรมแบบธรรมดาและแบบซับซ้อน การเกิดมะเร็งในระดับโมเลกุล การรักษาโรคทางพันธุกรรม ความรู้ทางด้านระบาดวิทยาในการป้องกันและการรักษาโรค การให้คำปรึกษาทางพันธุศาสตร์แก่ผู้ป่วยและจรรยาบรรณของการทำวิจัยในมนุษย์

SCBM 340 Basic Cellular Pathology 2 (2-0-4)

วทพ ๓๔๐ พื้นฐานพยาธิวิทยาระดับเซลล์

Pre-requisites: SCBM 214 Structure of Cell and Tissue

SCBM 234 Fundamental Immunology

SCBM 235 Fundamental Microbiology

วิชาบังคับก่อน: วทพ ๒๑๔ โครงสร้างของเซลล์และเนื้อเยื่อ

วทพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

วทพ ๒๓๕ จุลชีววิทยาพื้นฐาน

Cellular patterns and mechanism of cell injury; cell injury from chemical and physical factors; cell injury from biological factors; cellular aging; carcinogenesis

รูปแบบและกลไกความผิดปกติที่เป็นสาเหตุการบาดเจ็บของเซลล์ การบาดเจ็บของเซลล์จากปัจจัยกายภาพ การบาดเจ็บของเซลล์จากปัจจัยชีวภาพ การเสื่อมของเซลล์ การเกิดมะเร็ง

SCBM 341 General Pathology 2 (1-2-3)

วทพ ๓๔๑ พยาธิวิทยาพื้นฐาน

Pre-requisites: SCBM 211 Human Structure 1

SCBM 214 Structure of Cell and Tissue

SCBM 234 Fundamental Immunology

SCBM 235 Fundamental Microbiology

วิชาบังคับก่อน: วทพ ๒๑๑ โครงสร้างร่างกายมนุษย์ ๑

วทพ ๒๑๔ โครงสร้างของเซลล์และเนื้อเยื่อ

วทพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

วทพ ๒๓๕ จุลชีววิทยาพื้นฐาน

Cell injury and cell death; cell adaptations, inflammation and tissue repair; hemodynamic disorders and shock; immunopathology; neoplasia; pathology of infectious diseases; genetic diseases; environmental and nutritional pathology; histopathological techniques for distinguishing of pathological changes

การบาดเจ็บและการตายของเซลล์ การปรับตัวของเซลล์ การอักเสบและการซ่อมแซม ความไม่สมดุลของระบบไหลเวียนและภาวะช็อก พยาธิวิทยาภูมิคุ้มกัน เนื้องอกและมะเร็ง พยาธิสภาพของโรคติดเชื้อโรคทางพันธุกรรม พยาธิสภาพจากสภาพแวดล้อมและโภชนาการ เทคนิคทางจุลพยาธิวิทยาสำหรับการจำแนกการเปลี่ยนแปลงทางพยาธิสภาพ



SCBM 347 Systemic Pathology 3 (2-2-5)

วทขพ ๓๔๗ พยาธิวิทยาาระบบ

Pre-requisites: SCBM 211 Human Structure 1

SCBM 214 Structure of Cell and Tissue

SCBM 234 Fundamental Immunology

SCBM 235 Fundamental Microbiology

วิชาบังคับก่อน: วทขพ ๒๑๑ โครงสร้างร่างกายมนุษย์ ๑

วทขพ ๒๑๔ โครงสร้างของเซลล์และเนื้อเยื่อ

วทขพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

วทขพ ๒๓๕ จุลชีววิทยาพื้นฐาน

Pathophysiology of diseases and anatomical pathology within the human body: the cardiovascular system, the respiratory system, the gastrointestinal system, the renal and the urinary tract system, the male reproductive system, the female reproductive system, the musculoskeletal and the soft tissue system, skin, the endocrine system, the hematology and lymphoid system; the correlations between pathology and research fields

พยาธิสรีรวิทยาและพยาธิสภาพของโรคในระบบหัวใจและหลอดเลือด ระบบหายใจ ระบบย่อยอาหาร ระบบไต และตับถ่าย ระบบสืบพันธุ์เพศชาย ระบบสืบพันธุ์สตรี ระบบโครงสร้างกระดูกและกล้ามเนื้อ ระบบปกคลุมร่างกาย ระบบต่อมไร้ท่อ ระบบเลือดและต่อมน้ำเหลือง การประยุกต์ใช้พยาธิวิทยาภายในงานวิจัย

SCBM 351 Principal Actions of Therapeutic Agents 1 (1-0-2)

วทขพ ๓๕๑ หลักการออกฤทธิ์ของยา

Pre-requisites: SCBM 261 Physiology for Medical Sciences 1

SCBM 262 Physiology for Medical Sciences 2

SCBM 263 Physiology for Medical Sciences 3

วิชาบังคับก่อน: วทขพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

วทขพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

วทขพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓

Principles of drug action; pharmacodynamics: how drug acts, mechanisms of drug action, drug-receptor interaction, concept of time-effect and dose-response relationships; pharmacokinetics: absorption, distribution, metabolism, excretion; factors determining the time course of drug action; adverse drug reactions; drugs affecting the autonomic nervous system

หลักการออกฤทธิ์ของยา เภสัชพลศาสตร์: ยาออกฤทธิ์อย่างไร กลไกการออกฤทธิ์ของยา การจับของยากับตัวรับ การออกฤทธิ์ของยาที่สัมพันธ์กับเวลาที่ได้รับยาและขนาดของยา เภสัชจลนศาสตร์: กระบวนการดูดซึม การกระจายตัว การเปลี่ยนแปลง การขับยาออกจากร่างกาย ปัจจัยต่าง ๆ ที่มีผลต่อการออกฤทธิ์ของยา อาการไม่พึงประสงค์จากการใช้ยา ยาออกฤทธิ์ต่อระบบประสาทอัตโนมัติ



SCBM 352 Pharmacology 1 2 (2-0-4)

วทพ ๓๕๒ เกษัตริย์วิทยา ๑

Pre-requisites: SCBM 261 Physiology for Medical Sciences 1

SCBM 262 Physiology for Medical Sciences 2

SCBM 263 Physiology for Medical Sciences 3

วิชาบังคับก่อน: วทพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

วทพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

วทพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓

Co-requisites: SCBM 353 Pharmacology 2

วิชาที่ต้องเรียนพร้อมกัน: วทพ ๓๕๓ เกษัตริย์วิทยา ๒

Principles and mechanisms of dysfunction and diseases of cardiovascular, respiratory, gastrointestinal, urinary systems; general sensation; pain; analgesic; anti-pyretics-anti-inflammatory; anesthetics; motor disorders and treatment; psychiatric disorders and treatment; sleep; drugs for sleep disorders; epilepsy and treatment; learning memory; dementia and treatment; drug abuse and treatment; drug dependence

หลักการและกลไกของการเกิดความผิดปกติและโรคของระบบหัวใจหลอดเลือด ระบบทางเดินหายใจ ระบบทางเดินอาหาร ระบบทางเดินปัสสาวะ การรับรู้ความรู้สึกทั่วไป ความเจ็บปวด ยาระงับปวด ยาลดไข้-ต้านอักเสบ ยาระงับความรู้สึก ความผิดปกติของระบบควบคุมการเคลื่อนไหวและการรักษา โรคจิตประสาทและยาที่ใช้รักษา การนอนหลับ ยานอนหลับ โรคชักและการรักษา การเรียนรู้และการจำ โรคความจำเสื่อมและการรักษา การใช้ยาในทางที่ผิดและการรักษา การติดยา

SCBM 353 Pharmacology 2 2 (2-0-4)

วทพ ๓๕๓ เกษัตริย์วิทยา ๒

Pre-requisites: SCBM 261 Physiology for Medical Sciences 1

SCBM 262 Physiology for Medical Sciences 2

SCBM 263 Physiology for Medical Sciences 3

วิชาบังคับก่อน: วทพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

วทพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

วทพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓

Co-requisites: SCBM 352 Pharmacology 1

วิชาที่ต้องเรียนพร้อมกัน: วทพ ๓๕๒ เกษัตริย์วิทยา ๑

Principles and mechanisms of dysfunction and diseases of the integumentary, endocrine, reproductive systems; sites of action, mechanisms of action, indications, rationale for drugs acting on the skin; drugs for endocrine disorders; drugs for the reproductive dysfunction; hormones; contraceptives; principles of toxicology; drugs affecting the immune system; anti-microbials; anti-cancer drugs



หลักการและกลไกของการเกิดความผิดปกติและโรคของระบบผิวหนัง ระบบต่อมไร้ท่อ ระบบสืบพันธุ์ กลไกและเป้าหมายการออกฤทธิ์ของยา ข้อบ่งใช้ การเลือกใช้และอาการไม่พึงประสงค์จากการใช้ยาเพื่อรักษาโรคและความผิดปกติของระบบผิวหนัง ยารักษาความผิดปกติของระบบต่อมไร้ท่อ ยารักษาความผิดปกติของระบบสืบพันธุ์ ฮอโมน ยาคุมกำเนิด หลักการทางพิษวิทยา ยารักษาความผิดปกติของระบบภูมิคุ้มกัน ยาด้านจุลชีพ ยาด้านมะเร็ง

SCBM 371 Generic Skills in Science Research 1 (1-0-2)

วทพ ๓๗๑ ทักษะทั่วไปในงานวิจัยทางวิทยาศาสตร์

Pre-requisites: SCBM 101 Basic Information Literacy

วิชาบังคับก่อน: วทพ ๑๐๑ การเรียนรู้สารสนเทศพื้นฐาน

Qualities of a good researcher; effective data searching in the science database; safety in laboratory, biology, chemistry, radiation and electricity; ethics in human subject research and experimental animals in science; intellectual property rights; qualities of responsibilities and references of the research works; techniques of writing proposals, research projects, research grants, research reports and manuscripts for publication

คุณสมบัติของนักวิจัยที่ดี การค้นหาข้อมูลในฐานข้อมูลทางวิทยาศาสตร์อย่างมีประสิทธิภาพ ความปลอดภัยในห้องปฏิบัติการ ความปลอดภัยทางชีวภาพ เคมี รังสี และไฟฟ้า จริยธรรมในการวิจัยในมนุษย์ และการทดลองสัตว์ในด้านวิทยาศาสตร์ สิทธิในทรัพย์สินทางปัญญา การกระทำผิด คุณลักษณะของความรับผิดชอบและการอ้างอิงผลงานวิจัย เทคนิคการสร้างและเขียนโครงร่าง โครงการวิจัย การเขียนขอทุนวิจัย การเขียนรายงานวิจัย และต้นฉบับเพื่อส่งตีพิมพ์

SCBM 372 Laboratory Exploration 1 (1-0-2)

วทพ ๓๗๒ ห้องปฏิบัติการศึกษา

Pre-requisites: SCBM 225 Laboratory in Biochemistry

SCBM 233 Laboratory in Microbiology and Immunology

วิชาบังคับก่อน: วทพ ๒๒๕ ปฏิบัติการชีวเคมี

วทพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา

An introduction to research experimentations in biomedical science: guidance and demonstration in scientific laboratories including molecular and cell biology, biochemistry, proteomics, genetics, microbiology, pathology, and related fields

บทนำเข้าสู่กระบวนการวิจัยและระเบียบวิจัยในขอบเขตของวิทยาศาสตร์ชีวการแพทย์ การให้คำแนะนำและการสาธิตการทำวิจัยในห้องปฏิบัติการวิทยาศาสตร์ต่าง ๆ ได้แก่ ห้องปฏิบัติการทางด้านชีววิทยาระดับโมเลกุลและระดับเซลล์ ชีวเคมี โปรตีนอิมิกส์ จุลชีววิทยา พยาธิวิทยา และสาขาที่เกี่ยวข้อง

SCBM 373 Bioinformatics 2 (2-0-4)

วทพ ๓๗๓ ชีวสารสนเทศ

Pre-requisites: SCBM 224 Biochemistry

วิชาบังคับก่อน: วทพ ๒๒๔ ชีวเคมี



Understanding biological databases, such as NCBI, PDB, PFAM; basic concepts of molecular sequence analyses, such as pairwise sequence alignment, multiple sequence alignment and molecular phylogenetic analysis; basic concepts in structural bioinformatics; understanding microarray analysis and systems biology

ความเข้าใจเกี่ยวกับฐานข้อมูลทางชีววิทยา เช่น NCBI PDB และ PFAM เป็นต้น แนวคิดพื้นฐานของการวิเคราะห์ข้อมูลลำดับข้อมูลชีววิทยาด้วยวิธีการแพร์ไวส์ซีควนซ์ไลน์เมนต์ มัลติเพิลซีควนซ์ไลน์เมนต์ และการวิเคราะห์ด้วยวิธีการทางไฟโลจีนีติก แนวคิดเบื้องต้นเกี่ยวกับการวิเคราะห์โครงสร้างของสารชีวโมเลกุล ความเข้าใจเบื้องต้นเกี่ยวกับไมโครอะเรย์และชีววิทยาระบบ

SCBM 374 Gene Technology 1 (0-2-1)

วทชพ ๓๗๔ เทคโนโลยีด้านยีน

Pre-requisites: SCBM 224 Biochemistry

SCBM 225 Laboratory in Biochemistry

วิชาบังคับก่อน: วทชพ ๒๒๔ ชีวเคมี

วทชพ ๒๒๕ ปฏิบัติการชีวเคมี

Gene manipulation and recombinant DNA techniques; principles of gene technology; mini-projects involving handling of nucleic acid and proteins; an evaluation of the quality of data generated; laboratory rules and regulations

เทคนิคการจัดยีนและการตัดต่อยีน หลักการเทคโนโลยีด้านยีน โครงการทดลองย่อยที่เกี่ยวข้องกับกรดนิวคลีอิกและโปรตีน การประเมินคุณภาพของข้อมูลจากผลการทดลอง กฎและระเบียบการใช้ห้องปฏิบัติการ

SCBM 375 Microscopy and Bioimaging 2 (1-2-3)

วทชพ ๓๗๕ จุลทรรศน์ศาสตร์และภาพชีวภาพ

Pre-requisites: SCBM 214 Structure of Cell and Tissue

วิชาบังคับก่อน: วทชพ ๒๑๔ โครงสร้างของเซลล์และเนื้อเยื่อ

Types and operations of light microscopes: optical, phase, dark-field, differential interference contrast, confocal, fluorescence, stereomicroscope, and electron microscopes; tissues preparation, imaging, and image interpretation for research in biological sciences; bioimaging analyses: ultrasound, X-ray, mass spectrometry, and magnetic resonance

ชนิดและการใช้งานกล้องจุลทรรศน์ ได้แก่ แบบใช้แสง แบบเฟส แบบพื้นมืด แบบดิฟเฟอเรนเชียลอินเตอร์เฟอเรนซ์คอนทราสต์ แบบคอนโฟคัล แบบใช้แสงฟลูออเรสเซนซ์ แบบสเตอริโอ แบบใช้แสงอิเล็กตรอน ชนิดส่องผ่านและชนิดส่องกราด ขั้นตอนการเตรียมชิ้นเนื้อ การถ่ายภาพและการแปลผลภาพในงานวิจัยทางวิทยาศาสตร์ชีวภาพ การวิเคราะห์ผลร่วมกับภาพชีวภาพ ได้แก่ ภาพถ่ายคลื่นเสียงความถี่สูง ภาพถ่ายรังสีเอ็กซ์ ผลวิเคราะห์มวลสารและภาพถ่ายสัญญาณสะท้อนจากคลื่นแม่เหล็ก



SCBM 376 Cell Culture Techniques 2 (1-2-3)

วทพ ๓๗๖ เทคนิคการเพาะเลี้ยงเซลล์

Pre-requisites: SCBM 214 Structure of Cell and Tissue

SCBM 233 Laboratory in Microbiology and Immunology

วิชาบังคับก่อน: วทพ ๒๑๔ โครงสร้างของเซลล์และเนื้อเยื่อ

วทพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา

Laboratory rules and regulations; basic techniques for cultivation of anchorage-dependent and anchorage-independent cells; mass production of cells; cell propagation; determination of cell growth; maintenance of cell lines; cryo-preservation of cells and determination of cell survival after the cold storage; effects of certain parameters on the growth of anchorage-independent cell lines

กฎและระเบียบการใช้ห้องปฏิบัติการ เทคนิคขั้นพื้นฐานในการเพาะเลี้ยงเซลล์ชนิดที่เจริญแบบเกาะติดและที่เจริญแบบไม่เกาะติด การเพาะเลี้ยงเซลล์ในปริมาณสูง การขยายพันธุ์เซลล์ การเจริญของเซลล์และการคงสภาพสายพันธุ์เซลล์ การถนอมเซลล์โดยใช้ความเย็นและการตรวจเซลล์ที่รอดชีวิตหลังแช่แข็ง ผลของตัวแปรบางอย่างต่อการเจริญของสายพันธุ์เซลล์แบบไม่เกาะติด

SCBM 377 Use of Experimental Animals for Scientific Research 1 (1-0-2)

วทพ ๓๗๗ การใช้สัตว์ทดลองเพื่องานวิจัยทางวิทยาศาสตร์

Pre-requisites: SCBM 371 Generic Skills in Science Research

วิชาบังคับก่อน: วทพ ๓๗๑ ทักษะทั่วไปในงานวิจัยทางวิทยาศาสตร์

Ethics of animal experimentation; a selection of animal models; standard animal care and basic techniques for handling and drug administration for rats and mice; a choice of special techniques; how to work with animals in the laboratory

จริยธรรมในการทดลองในสัตว์ การเลือกสัตว์ตัวแบบ การดูแลสัตว์ตามมาตรฐานและการปฏิบัติพื้นฐานสำหรับการจับและให้อาหารในหนูแรทและเมาส์ การเลือกใช้วิธีปฏิบัติแบบพิเศษ การทำงานกับสัตว์ในห้องปฏิบัติการ

SCBM 490 Scientific Research Planning 4 (0-8-4)

วทพ ๔๙๐ การวางแผนงานวิจัยทางวิทยาศาสตร์

Pre-requisites: SCBM 371 Generic Skills in Science Research

SCBM 372 Laboratory Exploration

วิชาบังคับก่อน: วทพ ๓๗๑ ทักษะทั่วไปในงานวิจัยทางวิทยาศาสตร์

วทพ ๓๗๒ ห้องปฏิบัติการศึกษา

Journal and article search in international databases; literature review; research project advisor selections and discussions; identifications of research problems and hypotheses; outlines of experimental plans; research outlines and proposal writing

การค้นหาวารสารและบทความจากฐานข้อมูลนานาชาติ การทบทวนวรรณกรรม การเลือกและการอภิปรายอาจารย์ที่ปรึกษาโครงการวิจัย การระบุโจทย์งานวิจัยและสมมติฐาน การวางแผนการทดลอง การร่างงานวิจัยและการเขียนโครงร่างงานวิจัย



Degree ☒ Bachelor ☐ Master ☐ Doctoral
TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science
Department of Pathobiology

SCBM 491 Seminar in Biomedical Science 1 1 (1-0-2)

วทพ ๔๙๑ สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๑

Pre-requisites: SCBM 371 Generic Skills in Science Research

วิชาบังคับก่อน: วทพ ๓๗๑ ทักษะทั่วไปในงานวิจัยทางวิทยาศาสตร์

The techniques and procedures for the effective poster presentations; discussions and generations of ideas on issues related to a variety of biomedical science; research skills and practical experiences

เทคนิคและขั้นตอนการนำเสนอผลงานรูปแบบโปสเตอร์อย่างมีประสิทธิภาพ อภิปรายและนำเสนอความคิดทางด้านวิทยาศาสตร์ชีวการแพทย์หรือสาขาอื่น ๆ ที่เกี่ยวข้อง ทักษะและประสบการณ์ทางการวิจัยในงานประชุมวิชาการ

SCBM 492 Seminar in Biomedical Science 2 1 (1-0-2)

วทพ ๔๙๒ สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๒

Pre-requisites: SCBM 371 Generic Skills in Science Research

วิชาบังคับก่อน: วทพ ๓๗๑ ทักษะทั่วไปในงานวิจัยทางวิทยาศาสตร์

The techniques and procedures for the effective oral presentation; discussions and presentations of ideas on issues related to a variety of biomedical science; research skills and practical experiences in the academic conferences

เทคนิคและขั้นตอนการนำเสนอผลงานรูปแบบปากเปล่าอย่างมีประสิทธิภาพ อภิปรายและนำเสนอความคิดทางด้านวิทยาศาสตร์ชีวการแพทย์หรือสาขาอื่น ๆ ที่เกี่ยวข้อง ทักษะและประสบการณ์ทางการวิจัยในงานประชุมวิชาการ

SCBM 496 Scientific Writing 2 (2-0-4)

วทพ ๔๙๖ การเขียนงานทางวิทยาศาสตร์

Pre-requisites: SCBM 490 Scientific Research Planning

วิชาบังคับก่อน: วทพ ๔๙๐ การวางแผนงานวิจัยทางวิทยาศาสตร์

The techniques and procedures for writing: research, projects, manuscripts; a general overview of the form and the various aspects of scientific writing: citation, paraphrasing, general-specific format, sentence structure, summarizing, definitions, data commentary, editing

เทคนิคและกระบวนการสำหรับการเขียนงานวิจัย โครงงานวิจัย บทความทางวิชาการ แนวทางการใช้ถ้อยคำที่กระชับได้ใจความ การเขียนอ้างอิงในบรรณานุกรม การถอดความ โครงสร้างประโยค การเขียนสรุปความ คำจำกัดความ การแก้ไขปรับปรุงบทความจากข้อมูลวิจัยทางวิทยาศาสตร์

SCBM 499 Senior Project 6 (0-12-6)

วทพ ๔๙๙ โครงการวิจัย

Pre-requisites: SCBM 490 Scientific Research Planning

วิชาบังคับก่อน: วทพ ๔๙๐ การวางแผนงานวิจัยทางวิทยาศาสตร์



An original or well-defined research project related to analytical medical science will be undertaken by individual students under the guidance of advisors

นักศึกษาจะต้องทำโครงการวิจัยที่มีความริเริ่มใหม่ หรือมีเนื้อหาที่จะให้ผลสรุปชัดเจนเป็นประโยชน์ทางด้านวิทยาศาสตร์ทางการแพทย์ภายใต้การให้คำแนะนำของอาจารย์ที่ปรึกษา

3) Major Elective Courses

Module A: Neuroscience

SCAN 311 Cellular and Molecular Neuroscience 3 (3-0-6)

วททว ๓๑๑ ประสาทวิทยาศาสตร์ระดับเซลล์และโมเลกุล

Pre-requisites: SCBM 261 Physiology for Medical Science 1

วิชาบังคับก่อน: วททพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

Co-requisites: SCBM 312 Medical Neuroscience

วิชาบังคับเรียนพร้อมกัน: วททพ ๓๑๒ ประสาทวิทยาศาสตร์การแพทย์

Cellular and molecular processes of the nervous systems; neurotransmitters and synaptic transmission; neurotrophic factors; advanced microanatomy of the nervous systems; stem cells of the nervous systems; gene regulation of brain and nerve

กลไกระดับเซลล์และโมเลกุลของระบบประสาท สารสื่อประสาทและการสื่อสารสัญญาณประสาท ตัวกระตุ้นการเจริญของระบบประสาท จุลกายวิภาคขั้นสูงของระบบประสาท เซลล์ต้นกำเนิดของระบบประสาท การควบคุมการแสดงออกของยีนในสมองและเส้นประสาท

SCAN 312 Techniques in Neuroscience Research 3 (2-2-5)

วททว ๓๑๒ เทคนิคในงานวิจัยทางประสาทวิทยาศาสตร์

Pre-requisites: SCBM 261 Physiology for Medical Science 1

วิชาบังคับก่อน: วททพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

Model organisms and systems for neuroscience research; cellular and molecular techniques in neuroscience; electrical measurements of neuronal activities; optical and imaging techniques; anatomical techniques in neuroscience; behavioral studies in neuroscience; systems neuroscience and neural networks; laboratory practice in basic neuroscience techniques

สิ่งมีชีวิตและระบบต้นแบบสำหรับงานวิจัยทางด้านประสาทวิทยาศาสตร์ เทคนิคระดับเซลล์และโมเลกุลในประสาทวิทยาศาสตร์ การวัดสัญญาณไฟฟ้าของเซลล์ประสาท เทคนิคเชิงแสงและการถ่ายภาพ เทคนิคทางกายวิภาคของประสาทวิทยาศาสตร์ การศึกษาพฤติกรรมเชิงประสาทวิทยาศาสตร์ ประสาทวิทยาศาสตร์เชิงระบบและโครงข่ายประสาทเทียม การฝึกเทคนิคในห้องปฏิบัติการทางประสาทวิทยาศาสตร์

SCAN 411 Neurodegeneration and Neuroregeneration 2 (2-0-4)

วททว ๔๑๑ การเสื่อมสภาพและการฟื้นฟูสภาพของระบบประสาท

Pre-requisites: SCAN 311 Cellular and Molecular Neuroscience

วิชาบังคับก่อน: วททว ๓๑๑ ประสาทวิทยาศาสตร์ระดับเซลล์และโมเลกุล



Neurodegenerative diseases; genetic and environmental factors in neurodegeneration; cellular and molecular mechanisms of neurogenesis; concepts of neural stem cells; regenerative medicine

โรคของความเสื่อมสภาพทางระบบประสาท ปัจจัยทางพันธุกรรมและสภาพแวดล้อมต่อการเสื่อมสภาพของระบบประสาท กลไกระดับเซลล์และโมเลกุลของการสร้างเซลล์ประสาทใหม่ หลักการของเซลล์ต้นกำเนิดระบบประสาท เวชศาสตร์ฟื้นฟูสภาวะเสื่อม

SCAN 412 Innovation in Clinical Neuroscience 2 (2-0-4)

วททว ๔๑๒ นวัตกรรมของประสาทวิทยาศาสตร์เชิงคลินิก

Pre-requisites: SCAN 311 Cellular and Molecular Neuroscience

วิชาบังคับก่อน: วททว ๓๑๑ ประสาทวิทยาศาสตร์ระดับเซลล์และโมเลกุล

Basic principles underlying clinical presentation and investigation of diseases affecting brain and nerve; research and innovation in neuroscience; neurobiologics and neurobiosimilars; neurological medical devices for the assessment and treatment of neurological diseases; assistive technology in neurological patients

หลักการพื้นฐานในการประเมินโรคที่เกี่ยวข้องกับสมองและเส้นประสาท งานวิจัยและนวัตกรรมด้านประสาทวิทยาศาสตร์ ชีววัตถุและชีววัตถุคล้ายคลึงทางระบบประสาท เครื่องมือทางการแพทย์ที่ใช้ในการตรวจและรักษาทางระบบประสาท เทคโนโลยีสิ่งอำนวยความสะดวกที่ใช้ในกลุ่มผู้ป่วยทางระบบประสาท

Module B: Cell and Molecular Medicine

SCBC 321 Molecular Aspects of Human Diseases 3 (3-0-6)

วทชค ๓๒๑ ลักษณะระดับโมเลกุลของโรคในมนุษย์

Pre-requisites: SCBM 321 Medical Genetics

วิชาบังคับก่อน: วทชพ ๓๒๑ พันธุศาสตร์การแพทย์

Fundamental cell and molecular processes related to health and diseases; cell response to stresses; biotransformation; metabolic syndromes; cancers; stem cell biology and regenerative medicine; neurological diseases; systems biology in medicine; molecular diagnosis and treatment; research article discussions and presentations

หลักการของกลไกระดับเซลล์และโมเลกุลที่เกี่ยวข้องกับสภาวะและโรค การตอบสนองของเซลล์ต่อสภาวะเครียด การเปลี่ยนรูปทางชีวภาพ โรคทางเมแทบอลิซึม มะเร็ง ชีววิทยาเซลล์ต้นกำเนิดและเวชศาสตร์ฟื้นฟูสภาวะเสื่อม โรคทางระบบประสาท ชีววิทยาเชิงระบบทางการแพทย์ การวินิจฉัยและการรักษาระดับโมเลกุล การวิเคราะห์และนำเสนอ บทความวิจัย

SCBC 322 Laboratory Rotation in Cell and Molecular Medicine 3 (1-4-4)

วทชค ๓๒๒ การเวียนห้องปฏิบัติการทางเวชศาสตร์ระดับเซลล์และโมเลกุล

Pre-requisites: SCBM 225 Laboratory in Biochemistry

วิชาบังคับก่อน: วทชพ ๒๒๕ ปฏิบัติการชีวเคมี



A short research project; laboratory techniques related to biomedical research; an introduction to research methodologies in cell and molecular medicine

โครงการวิจัยระยะสั้น เทคนิคต่าง ๆ ในการใช้เครื่องมือการวิจัยทางการแพทย์ แนะนำระเบียบวิธีวิจัยทางด้านเวชศาสตร์ระดับเซลล์และโมเลกุล

SCBC 421 Frontiers in Molecular Bioscience 2 (2-0-4)

วทช ๔๒๑ ขอบเขตความรู้สมัยใหม่ทางชีววิทยาศาสตร์โมเลกุล

Pre-requisites: SCBM 224 Biochemistry

วิชาบังคับก่อน: วทชพ ๒๒๔ ชีวเคมี

Up-to-date information in various areas of molecular bioscience; selected topics of current interest and of potential research importance for biomedical science at the cellular and molecular levels; reading research articles and presentations in the form of a seminar; research proposal presentations in the oral format

ขอบเขตความรู้สมัยใหม่ในสาขาต่าง ๆ ของชีววิทยาศาสตร์โมเลกุล หัวข้องานวิจัยที่สำคัญในสาขาชีวเวชศาสตร์ระดับเซลล์และโมเลกุล การวิเคราะห์และนำเสนอบทความวิจัยในรูปแบบสัมมนา การนำเสนอโครงการวิจัยแบบปากเปล่า

SCBC 422 Innovation in Translational Biomedicine 2 (2-0-4)

วทช ๔๒๒ นวัตกรรมทางชีวเวชศาสตร์ปริวรรต

Pre-requisites: SCBM 224 Biochemistry

วิชาบังคับก่อน: วทชพ ๒๒๔ ชีวเคมี

Principles of biomedical innovation; concepts of translational medicine; aims of medical innovation in society; biomedical innovation incubation; site visit of applied biomedical private sectors

หลักการทางนวัตกรรมเชิงชีวเวชศาสตร์ แนวคิดทางเวชศาสตร์ปริวรรต เป้าหมายเชิงนวัตกรรมทางการแพทย์ ต่อสังคม การบ่มเพาะนวัตกรรมเชิงชีวเวชศาสตร์ การศึกษาดูงานในภาคเอกชนที่เกี่ยวข้องกับชีวเวชศาสตร์เชิงประยุกต์

Module C: Medical Microbiology

SCMI 331 Medical Bacteriology 2 (1-2-3)

วทช ๓๓๑ แบคทีเรียวิทยาทางการแพทย์

Pre-requisites: SCBM 233 Laboratory in Microbiology and Immunology

SCBM 234 Fundamental Immunology

SCBM 235 Fundamental Microbiology

วิชาบังคับก่อน: วทชพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา

วทชพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

วทชพ ๒๓๕ จุลชีววิทยาพื้นฐาน

Classification of pathogenic bacteria; bacteria-human interactions; pathogenesis of bacterial infection; host immune evasion by bacteria; principles of antibacterial therapy; dissemination of



antibacterial resistance; transmission and control of bacterial diseases; laboratory diagnosis of bacterial infection

การจำแนกแบคทีเรียก่อโรค ปฏิสัมพันธ์ระหว่างแบคทีเรียและมนุษย์ พยาธิกำเนิดของโรคติดเชื้อจากแบคทีเรีย การหลบหลีกการตอบสนองทางภูมิคุ้มกันของโฮสต์โดยแบคทีเรีย หลักการของการรักษาโดยยาต้านแบคทีเรีย การแพร่กระจายของการดื้อยาต้านจุลชีพ การติดต่อและการควบคุมโรคติดเชื้อจากแบคทีเรีย การวินิจฉัยทางห้องปฏิบัติการของโรคติดเชื้อจากแบคทีเรีย

SCMI 332 Medical Mycology and Parasitology 2 (1-2-3)

วทช ๓๓๒ วิทยาเชื้อราและปรสิตวิทยาทางการแพทย์

Pre-requisites: SCBM 233 Laboratory in Microbiology and Immunology

SCBM 234 Fundamental Immunology

SCBM 235 Fundamental Microbiology

วิชาบังคับก่อน: วทชพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา

วทชพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

วทชพ ๒๓๕ จุลชีววิทยาพื้นฐาน

Classification and life cycles of pathogenic fungi and parasites; human interactions with fungi and parasites; pathogenesis of fungal and parasitic infection; host immune evasion by fungi and parasites; treatment of fungal and parasitic infections; resistance to treatment of fungal and parasitic diseases; transmission and control of fungal and parasitic diseases; laboratory diagnosis of fungal and parasitic infections

การจำแนกและวงจรชีวิตของเชื้อราและปรสิต ปฏิสัมพันธ์ของมนุษย์กับเชื้อราและปรสิต พยาธิกำเนิดของโรคติดเชื้อจากเชื้อราและปรสิต การหลบหลีกการตอบสนองทางภูมิคุ้มกันของโฮสต์โดยเชื้อราและปรสิต การรักษาโรคติดเชื้อจากเชื้อราและปรสิต การติดต่อและการควบคุมโรคติดเชื้อจากเชื้อราและปรสิต การวินิจฉัยทางห้องปฏิบัติการของโรคติดเชื้อจากเชื้อราและปรสิต

SCMI 333 Medical Virology 2 (1-2-3)

วทช ๓๓๓ ไวรัสวิทยาทางการแพทย์

Pre-requisites: SCBM 233 Laboratory in Microbiology and Immunology

SCBM 234 Fundamental Immunology

SCBM 235 Fundamental Microbiology

วิชาบังคับก่อน: วทชพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา

วทชพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

วทชพ ๒๓๕ จุลชีววิทยาพื้นฐาน

Classification and replication cycles of pathogenic virus and prions; viral-human interactions; pathogenesis of viral infection; host immune evasion by viruses; therapeutic principle of viral infection; antiviral resistance; transmission and control of viral diseases; laboratory diagnosis of viral infection



การจำแนกและวงจรการถ่ายแบบทางพันธุกรรมของไวรัสก่อโรคและไพรอน ปฏิสัมพันธ์ระหว่างไวรัสและมนุษย์ พยาธิกำเนิดของโรคติดเชื้อจากไวรัส การหลบหลีกการตอบสนองทางภูมิคุ้มกันของโฮสต์โดยไวรัส หลักการของการรักษาโรคติดเชื้อจากไวรัส การดื้อยาต้านไวรัส การติดต่อและการควบคุมโรคติดเชื้อจากไวรัส การวินิจฉัยทางห้องปฏิบัติการของโรคติดเชื้อจากไวรัส

SCMI 431 Human Immune System in Health and Diseases 1 (1-0-2)

วทช ๔๓๑ ระบบภูมิคุ้มกันของมนุษย์ในสภาวะปกติและการเกิดโรค

Pre-requisites: SCBM 233 Laboratory in Microbiology and Immunology

SCBM 234 Fundamental Immunology

SCBM 235 Fundamental Microbiology

วิชาบังคับก่อน: วทชพ ๒๓๓ ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา

วทชพ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

วทชพ ๒๓๕ จุลชีววิทยาพื้นฐาน

Molecular mechanisms of immune response to foreign substances including microbes and transplanted organs; immunological disorders such as immunodeficiency, allergy and autoimmune diseases; tumor immunology; immunomodulation

กลไกระดับโมเลกุลของการตอบสนองของระบบภูมิคุ้มกันต่อสิ่งแปลกปลอม รวมไปถึงจุลชีพและอวัยวะปลูกถ่าย ความผิดปกติของภูมิคุ้มกัน อาทิเช่น ภาวะภูมิคุ้มกันบกพร่อง ภาวะภูมิแพ้ และภาวะภูมิคุ้มกันต่อตนเอง วิทยาภูมิคุ้มกันของเซลล์มะเร็ง การควบคุมการตอบสนองทางภูมิคุ้มกัน

SCMI 432 Current Research in Infectious Diseases 1 (1-0-2)

วทช ๔๓๒ หัวข้อวิจัยที่ทันสมัยทางโรคติดเชื้อ

Pre-requisites: SCMI 331 Medical Bacteriology

SCMI 332 Medical Mycology and Parasitology

SCMI 333 Medical Virology

วิชาบังคับก่อน: วทช ๓๓๑ แบคทีเรียวิทยาทางการแพทย์

วทช ๓๓๒ วิทยาเชื้อราและปรสิตวิทยาทางการแพทย์

วทช ๓๓๓ ไวรัสวิทยาทางการแพทย์

Co-requisites: SCMI 431 Human Immune System in Health and Diseases

SCPA 441 Diagnosis and Control of Infectious Diseases

วิชาที่ต้องเรียนพร้อมกัน: วทช ๔๓๑ ระบบภูมิคุ้มกันของมนุษย์ในสภาวะปกติและการเกิดโรค

วทช ๔๔๑ การวินิจฉัยและการควบคุมโรคติดต่อ

Current topics in human immune response against infectious diseases, pathogenesis of infectious agents, drug resistance mechanism of infectious agents, the development of antimicrobial agents and diagnosis and the control of infectious diseases



หัวข้อที่ทันสมัยเกี่ยวกับการตอบสนองของระบบภูมิคุ้มกันมนุษย์ต่อโรคติดเชื้อ การศึกษากระบวนการก่อโรคของเชื้อก่อโรค การศึกษาความสามารถในการดื้อยาของเชื้อก่อโรค การพัฒนายาต้านจุลชีพชนิดใหม่และการวินิจฉัยและการควบคุมโรคติดเชื้อ

Module D: Novel Therapeutic Strategies and Diagnosis

SCPA 341 Cancer Biology and Novel Biomarkers 2 (2-0-4)

วทพธ ๓๔๑ ชีววิทยาโรคมะเร็งและตัวบ่งชี้ทางชีวภาพแนวใหม่

Pre-requisites: SCBM 340 Basic Cellular Pathology

SCBM 341 General Pathology

วิชาบังคับก่อน: วทพธ ๓๔๐ พื้นฐานพยาธิวิทยาระดับเซลล์

วทพธ ๓๔๑ พยาธิวิทยาพื้นฐาน

Biology of tumor; characteristics of benign and malignant tumors; carcinogenesis and carcinogenic agents; cancer invasion and metastasis; proto-oncogene and oncogene; tumor suppressor gene; cancer and apoptosis; tumor angiogenesis; tumor microenvironment; tumor immunology; tumor markers; chemotherapy and the development of novel therapeutics; scientific research for tumor biology and novel biomarkers

ชีววิทยาก่อนเนื้องอก ลักษณะเนื้องอกธรรมดาและเนื้องอกมะเร็ง กระบวนการเกิดมะเร็งและปัจจัยก่อมะเร็ง การลุกลามและการแพร่กระจายของมะเร็ง กลุ่มยีนที่ทำหน้าที่ควบคุมการเจริญเติบโตปกติและกลุ่มยีนส่งเสริมการเกิดมะเร็ง กลุ่มยีนยับยั้งการเกิดมะเร็ง มะเร็งและการตายแบบอะพอพโทซิส กระบวนการสร้างเส้นเลือดใหม่ของเนื้องอก สภาวะแวดล้อมในก้อนเนื้องอก ภูมิคุ้มกันวิทยาต่อก้อนเนื้องอกตัวบ่งชี้ต่อก้อนเนื้องอก เคมีบำบัดและการพัฒนาการรักษาแนวใหม่ การวิจัยทางวิทยาศาสตร์สำหรับชีววิทยาเนื้องอกและตัวบ่งชี้ทางชีวภาพแนวใหม่

SCPA 342 Biological Aging and Regenerative Medicine 2 (2-0-4)

วทพธ ๓๔๒ ความชราภาพทางชีววิทยาและเวชศาสตร์ฟื้นฟูชะลอวัย

Pre-requisites: SCBM 341 General Pathology

SCBM 347 Systemic Pathology

วิชาบังคับก่อน: วทพธ ๓๔๑ พยาธิวิทยาพื้นฐาน

วทพธ ๓๔๗ พยาธิวิทยาระบบ

Biological aging and regenerative medicine; biology and genetic of aging; aging of the nervous system; aging of the circulatory system; aging of the endocrine system; aging of the skin system; biologic and molecular basis for regenerative medicine; regenerative medicine in heart diseases; regenerative medicine in diabetes; regenerative medicine in the skin system; homeopathy and alternative medicine for longevity and good health

ความชราภาพทางชีววิทยาและเวชศาสตร์ฟื้นฟูชะลอวัย ชีววิทยาและพันธุกรรมของความเสื่อม ความเสื่อมของระบบประสาท ความเสื่อมของระบบไหลเวียนโลหิต ความเสื่อมของระบบต่อมไร้ท่อ ความเสื่อมของผิวหนัง ชีววิทยาและพันธุกรรมพื้นฐานของเวชศาสตร์ฟื้นฟู เวชศาสตร์ฟื้นฟูของโรคหัวใจ เวชศาสตร์ฟื้นฟูของโรคเบาหวาน เวชศาสตร์ฟื้นฟูของผิวหนัง ธรรมชาติบำบัดและการแพทย์ทางเลือกเพื่อสุขภาพที่ดีและชีวิตที่ยืนยาว



Degree ☒ Bachelor ☐ Master ☐ Doctoral
 TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science
 Department of Pathobiology

SCPA 343 Discovery of Potential Therapy in Non-Communicable Diseases 2 (2-0-4)

วทพธ ๓๔๓ การค้นพบการรักษาที่เป็นไปได้ของกลุ่มโรคไม่ติดต่อ

Pre-requisites: SCBM 341 General Pathology

SCBM 347 Systemic Pathology

วิชาบังคับก่อน: วทพธ ๓๔๑ พยาธิวิทยาพื้นฐาน

วทพธ ๓๔๗ พยาธิวิทยาระบบ

An impact of non-communicable diseases on global burden of diseases; causes; risk factors; therapy; prevention; management; control of non-communicable diseases

ผลกระทบของกลุ่มโรคไม่ติดต่อ สาเหตุ ปัจจัยเสี่ยง การรักษา การป้องกัน การจัดการ การควบคุมโรคไม่ติดต่อ

SCPA 441 Diagnosis and Control of Infectious Diseases 2 (2-0-4)

วทพธ ๔๔๑ การวินิจฉัยและการควบคุมโรคติดต่อ

Pre-requisites: SCBM 234 Fundamental Immunology

SCBM 235 Fundamental Microbiology

SCBM 341 General Pathology

วิชาบังคับก่อน: วทพธ ๒๓๔ ภูมิคุ้มกันวิทยาพื้นฐาน

วทพธ ๒๓๕ จุลชีววิทยาพื้นฐาน

วทพธ ๓๔๑ พยาธิวิทยาพื้นฐาน

The standard diagnosis of infectious diseases; the development of novel diagnosis; emerging, transmission, and epidemiology; prevention and control

การวินิจฉัยมาตรฐานของโรคติดต่อ การพัฒนาการวินิจฉัยแบบใหม่ การอุบัติใหม่ การติดต่อและการระบาด การป้องกันและการควบคุม

SCPA 442 Novel Research on Therapeutic Strategies and Diagnosis 2 (0-4-2)

วทพธ ๔๔๒ งานวิจัยสมัยใหม่ที่เกี่ยวข้องกับกลยุทธ์ในการรักษาและวินิจฉัยโรค

Pre-requisites: SCBM 341 General Pathology

SCPA 343 Discovery of Potential Therapy in Non-Communicable Diseases

วิชาบังคับก่อน: วทพธ ๓๔๑ พยาธิวิทยาพื้นฐาน

วทพธ ๓๔๗ การค้นพบการรักษาที่เป็นไปได้ของกลุ่มโรคไม่ติดต่อ

Therapeutic strategies and diagnosis based on the novel research; biological aging and regenerative medicine: oxidative stress assays, aging marker detection, special staining, observatory activities in analytically cosmeceutical sciences and biomaterials/medicinal production; therapies in non-communicable diseases: gene and cell therapy, natural therapy, therapy in genetic disorders; cancer: cancer interpretation, cancer biomarkers, cancer migration, cancer invasion, and tumor angiogenesis



กลยุทธ์และการวินิจฉัยโรคบนพื้นฐานความรู้จากงานวิจัยสมัยใหม่ ศาสตร์ของชีววิทยาของความเสื่อม การวิเคราะห์ทางเคมีของอนุมูลอิสระ การตรวจหาตัวบ่งชี้ของความเสื่อม การย้อมพิเศษ การดูลักษณะเกี่ยวกับวิทยาศาสตร์การวิเคราะห์เวชสำอางค์และการผลิตวัสดุทางชีวภาพหรือผลิตภัณฑ์ทางการแพทย์ การบำบัดโรคในกลุ่มโรคไม่ติดต่อเรื้อรัง การบำบัดโรคด้วยยีนและเซลล์ การบำบัดโรคด้วยธรรมชาติบำบัด เทคนิคการบำบัดในกลุ่มโรคทางพันธุกรรม โรคมะเร็ง การแปลผลมะเร็ง ตัวบ่งชี้ต่อก่อนเนื้องอก การอพยพของมะเร็ง การลุกลามของมะเร็ง กระบวนการสร้างเส้นเลือดใหม่ของเนื้องอก

Module E: Frontiers in Drug Discovery and Therapeutic Perspectives

SCPM 351 Clinical Pharmacology 2 (2-0-4)

วทส ๓๕๑ เภสัชวิทยาคลินิก

Pre-requisites: SCBM 351 Principal Actions of Therapeutic Agents

SCBM 352 Pharmacology 1

SCBM 353 Pharmacology 2

วิชาบังคับก่อน: วทชพ ๓๕๑ หลักการออกฤทธิ์ของยา

วทชพ ๓๕๒ เภสัชวิทยา ๑

วทชพ ๓๕๓ เภสัชวิทยา ๒

Clinical concepts in pharmacotherapy of cardiovascular, respiratory, gastrointestinal, neurological, psychiatric, endocrine systems; infectious disorders; the management of adverse drug reactions

แนวคิดเชิงคลินิกทางเภสัชวิทยาในการรักษาโรคของระบบหัวใจและหลอดเลือด ระบบการหายใจ ระบบทางเดินอาหาร ระบบประสาท ระบบต่อมไร้ท่อ โรคติดเชื้อ การจัดการผลข้างเคียงจากการใช้ยา

SCPM 352 Seminar in Pharmacology 2 (2-0-4)

วทส ๓๕๒ สัมมนาทางเภสัชวิทยา

Pre-requisites: SCBM 351 Principal Actions of Therapeutic Agents

SCBM 352 Pharmacology 1

SCBM 353 Pharmacology 2

วิชาบังคับก่อน: วทชพ ๓๕๑ หลักการออกฤทธิ์ของยา

วทชพ ๓๕๒ เภสัชวิทยา ๑

วทชพ ๓๕๓ เภสัชวิทยา ๒

Pharmacodynamics; pharmacokinetics; pharmacogenomics; pharmacology of drugs acting on systems; free radical and antioxidants; thalassemia; pharmacology of herbal medicines; pharmacology of substance abuse; drug addiction; drug modeling; research ethics

เภสัชพลศาสตร์ เภสัชจลนศาสตร์ เภสัชพันธุศาสตร์ เภสัชวิทยาของยาที่มีฤทธิ์ต่อระบบต่างๆ อนุมูลอิสระและยาต้านอนุมูลอิสระ โรคธาลัสซีเมีย เภสัชวิทยาของสมุนไพร เภสัชวิทยาของสารที่ถูกนำมาใช้ทางที่ผิด การติดยา การออกแบบและพัฒนาตัวยาโดยใช้คอมพิวเตอร์ จริยธรรมการวิจัย



SCPM 353 Precision Medicine 2 (2-0-4)

วทภส ๓๕๓ การแพทย์แม่นยำ

Pre-requisites: SCBM 351 Principal Actions of Therapeutic Agents

SCBM 352 Pharmacology 1

SCBM 353 Pharmacology 2

วิชาบังคับก่อน: วทขพ ๓๕๑ หลักการออกฤทธิ์ของยา

วทขพ ๓๕๒ เภสัชวิทยา ๑

วทขพ ๓๕๓ เภสัชวิทยา ๒

Human genetics and genomes; pharmacogenomics; advances in genomic and information technology; genetic tests and genomic biomarkers; optimal drug therapy; drug discovery; drug development; health care

ยีนและพันธุกรรมของมนุษย์ เภสัชพันธุศาสตร์ ความก้าวหน้าทางข้อมูลพันธุกรรม การตรวจทางพันธุกรรมและตัวชี้วัดทางชีวภาพ การรักษาด้วยยาที่เหมาะสมที่สุด การค้นพบยา การพัฒนายา การดูแลสุขภาพ

SCPM 451 Cosmetics and Nutraceuticals 2 (1-2-3)

วทภส ๔๕๑ เครื่องสำอางและโภชนเภสัชภัณฑ์

Pre-requisites: SCBM 351 Principal Actions of Therapeutic Agents

SCBM 352 Pharmacology 1

SCBM 353 Pharmacology 2

วิชาบังคับก่อน: วทขพ ๓๕๑ หลักการออกฤทธิ์ของยา

วทขพ ๓๕๒ เภสัชวิทยา ๑

วทขพ ๓๕๓ เภสัชวิทยา ๒

Fundamental concepts of cosmetic science; introduction to physiology: skin, hair, eye, nail; cosmetic formulations: principles, ingredients and basic techniques, quality control and regulations of cosmetic products; advanced cosmetic formulations; an introduction to nutraceuticals: discovery, definition, classification; nutraceuticals in health care: therapeutic benefits; drug interactions; adverse effects; quality control and regulations of nutraceutical products; advancement in the drug delivery systems; current trend in research

แนวคิดพื้นฐานของวิทยาศาสตร์เครื่องสำอาง บทนำสู่สรีรวิทยา ผิวหนัง ผม ตา เล็บ การตั้งตำรับเครื่องสำอาง หลักการ ส่วนผสม เทคนิคขั้นพื้นฐาน การควบคุมคุณภาพและข้อกำหนดของผลิตภัณฑ์เครื่องสำอาง การตั้งตำรับเครื่องสำอางขั้นสูง บทนำสู่โภชนเภสัชภัณฑ์ การค้นพบ คำจำกัดความ การจำแนกชนิด โภชนเภสัชภัณฑ์ในการดูแลสุขภาพ ประโยชน์ในการบำบัดโรค อันตรกิริยาของยา ผลไม่พึงประสงค์ การควบคุมคุณภาพและข้อกำหนดของโภชนเภสัชภัณฑ์ ความก้าวหน้าของระบบนำส่งยา แนวโน้มปัจจุบันทางด้านวิจัย



SCPM 452 Animal Models for Drug Testing 2 (2-0-4)

วทส ๔๕๒ การใช้สัตว์ตัวแบบเพื่อการทดสอบยา

Pre-requisites: SCBM 351 Principal Actions of Therapeutic Agents

SCBM 352 Pharmacology 1

SCBM 353 Pharmacology 2

วิชาบังคับก่อน: วทชพ ๓๕๑ หลักการออกฤทธิ์ของยา

วทชพ ๓๕๒ เภสัชวิทยา ๑

วทชพ ๓๕๓ เภสัชวิทยา ๒

Processes of animal use and the drug development; pharmacological and toxicological testings: eye irritancy, skin irritation, corrosion, sensitization, absorption tests, embryotoxicity; pathophysiological factors related to drug responses: pro-inflammatory conditions, neurodegenerative disorders, viral infections, type II diabetes, liver injury; carcinogenicity study in rodents; medical research in non-human primates

ขั้นตอนการใช้สัตว์และการพัฒนายา การทดสอบทางเภสัชวิทยาและพิษวิทยา การระคายเคืองตา ผิวหนัง การกัดกร่อน การทำให้ไวต่อสิ่งกระตุ้น การดูดซึม ความเป็นพิษต่อตัวอ่อน ปัจจัยทางด้านพยาธิสรีรวิทยาที่เกี่ยวข้องต่อการตอบสนองต่อยา สภาวะเหนียวทำให้เกิดการอักเสบ ความผิดปกติเกี่ยวกับความเสื่อมทางระบบประสาท การติดเชื้อไวรัส เบาทะหวานชนิดที่ 2 การเสียหายของตับ การศึกษาความเป็นสารก่อมะเร็งในสัตว์ฟันแทะ งานวิจัยทางการแพทย์ในสัตว์จำพวกไพรเมตที่ไม่ใช่มนุษย์

Module F: Translational Physiology

SCPS 361 Physiology of Aging 2 (2-0-4)

วทสร ๓๖๑ สรีรวิทยาของภาวะความชรา

Pre-requisites: SCBM 261 Physiology for Medical Sciences 1

SCBM 262 Physiology for Medical Sciences 2

SCBM 263 Physiology for Medical Sciences 3

วิชาบังคับก่อน: วทชพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

วทชพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

วทชพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓

Physiology of human development and aging; the influence of diet, environment and exercise on aging process; effects of normal aging processes on homeostatic mechanisms; the effects of changes in homeostasis to development of disorders and diseases in later life

สรีรวิทยาของการพัฒนาการและภาวะความชราของมนุษย์ ผลของอาหาร ภาวะแวดล้อมและการออกกำลังกาย ต่อกระบวนการเสื่อมของร่างกาย ผลของความเสื่อมในภาวะปกติต่อการรักษาภาวะสมดุล ผลของการเปลี่ยนแปลง ภาวะสมดุลต่อการเกิดโรคและความผิดปกติต่อไปในชีวิต



SCPS 362 Exercise Physiology 2 (1-2-3)

วทสร ๓๖๒ สรีรวิทยาการออกกำลังกาย

Pre-requisites: SCBM 261 Physiology for Medical Sciences 1

SCBM 262 Physiology for Medical Sciences 2

SCBM 263 Physiology for Medical Sciences 3

วิชาบังคับก่อน: วทขพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

วทขพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

วทขพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓

Physiological response to exercise; the neural control of the body movement; mechanism of muscle contraction and its regulation; adaptations of the nervous system to exercise training; adaptations of skeletal muscle to weight training, disuse, aging, and injury

การตอบสนองทางสรีรวิทยาต่อการออกกำลังกาย การควบคุมการเคลื่อนไหวของร่างกายโดยระบบประสาท กลไกการหดตัวของกล้ามเนื้อและการควบคุม การปรับตัวของระบบประสาทต่อการฝึกออกกำลังกาย การปรับตัวของกล้ามเนื้อลายต่อการฝึกออกกำลังกายโดยใช้น้ำหนัก การไม่ใช้งาน สภาวะชราภาพและการบาดเจ็บ

SCPS 363 Seminar in Translational Physiology 2 (2-0-4)

วทสร ๓๖๓ สัมมนาทางสรีรวิทยาปริวรรต

Pre-requisites: SCBM 261 Physiology for Medical Sciences 1

SCBM 262 Physiology for Medical Sciences 2

SCBM 263 Physiology for Medical Sciences 3

วิชาบังคับก่อน: วทขพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

วทขพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

วทขพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓

Techniques in analyzing, criticizing, presenting key findings, research rational, experimental approach, results from articles in physiology; techniques in discussion and question handling

เทคนิคการวิเคราะห์ วิวิจารณ์ นำเสนอสาระสำคัญ ที่มาของประเด็นปัญหา วิธีการวิจัย ผลการวิจัย จากบทความวิจัยทางสรีรวิทยา เทคนิคการอภิปรายให้ข้อคิดเห็นและตอบข้อซักถาม

SCPS 461 Brain, Mind and Behavior 2 (2-0-4)

วทสร ๔๖๑ สมอง จิตใจ และพฤติกรรม

Pre-requisites: SCBM 261 Physiology for Medical Sciences 1

SCBM 262 Physiology for Medical Sciences 2

SCBM 263 Physiology for Medical Sciences 3

วิชาบังคับก่อน: วทขพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

วทขพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

วทขพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓



Physiological regulation of behavior, emotion, cognition, wakefulness and sleep, learning and memory; psychological disorders such as Autism, addiction, depression, schizophrenia

การควบคุมทางสรีรวิทยาของพฤติกรรม อารมณ์ ความคิดและการรับรู้ การหลับ-ตื่น การเรียนรู้และความทรงจำ ภาวะผิดปกติของจิต เช่น ออทิสซึม ภาวะการติดสิ่งเสพติด ภาวะซึมเศร้า โรคจิตเภท

SCPS 462 Trends in Translational Physiology 2 (1-2-3)

วทสร ๔๖๒ แนวโน้มทางสรีรวิทยาปริวรรต

Pre-requisites: SCBM 261 Physiology for Medical Sciences 1

SCBM 262 Physiology for Medical Sciences 2

SCBM 263 Physiology for Medical Sciences 3

วิชาบังคับก่อน: วทขพ ๒๖๑ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑

วทขพ ๒๖๒ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒

วทขพ ๒๖๓ สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓

Current topics and directions in translational physiology; integrative physiology; application and integration of physiology knowledge with other disciplines; current topics in physiology; new technologies in physiological and related fields

ความรู้ปัจจุบันและทิศทางในการนำความรู้ด้านสรีรวิทยาไปใช้ การทำงานที่สอดประสานกันของระบบต่าง ๆ การประยุกต์และความเชื่อมโยงความรู้ทางสรีรวิทยากับศาสตร์อื่น ๆ หัวข้อปัจจุบันทางสรีรวิทยา เทคโนโลยีใหม่ทางสรีรวิทยาหรือศาสตร์ที่เกี่ยวข้อง

c. Elective courses no less than 6 credits

SCBM 201 Science of Happiness 1 (1-0-2)

วทขพ ๒๐๑ วิทยาศาสตร์แห่งความสุข

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

The explanation of happiness through the point of views in science: definitions of happiness, basic neuroscience and psychology associated with happiness; understanding keywords related with happiness: desire, enjoyment, love, friendship and passion; class discussion in various topics: activity-related to happiness creations, socialization and happiness, travelling and happiness; presentation session about individual happiness

การขยายความถึงผ่านแง่มุมทางวิทยาศาสตร์ นิยามของคำว่าความสุข ประสาทวิทยาและจิตวิทยาเบื้องต้นเกี่ยวกับความสุข เข้าใจความหมายของคำสำคัญที่เกี่ยวกับความสุข ความปรารถนา ความเพลิดเพลิน ความรัก มิตรภาพ และความหลงใหล คาบเรียนที่มีการแลกเปลี่ยนความรู้ในหัวข้อต่าง ๆ กิจกรรมที่เกี่ยวข้องกับการสร้างความสุข การเข้าสู่สังคมและความสุข การท่องเที่ยวและความสุข การนำเสนอเกี่ยวกับกิจกรรมที่ทำให้เกิดความสุขในแต่ละบุคคล



Degree ☒ Bachelor ☐ Master ☐ Doctoral
TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science
Department of Pathobiology

SCBM 202 Strictly Come Ballroom Dancing 1 (0-2-1)

วทพ ๒๐๒ เกิดมาเพื่อเต้น

Pre-requisites: No

วิชาบังคับก่อน: ไม่มี

An introduction to International Standard and Latin ballroom dancing; basic figures and choreographies in at least two International Standard ballroom dances, including waltz and quickstep; basic figures and choreographies in at least two International Latin ballroom dances, including cha-cha-cha and jive; dancing techniques and musicality in at least four dances, including waltz, quickstep, cha-cha-cha, and jive

ความรู้เบื้องต้นเกี่ยวกับการเต้นลีลาศสากลทั้งในแขนงมาตรฐานและแขนงละติน ทำพื้นฐานและชุดท่าเต้นสำหรับการเต้นลีลาศในแขนงมาตรฐาน อาทิเช่น วอลซ์และควิกสเต็ป ทำพื้นฐานและชุดท่าเต้นสำหรับการเต้นลีลาศในแขนงละติน อาทิเช่น ชะชะซ่าและไจฟ์ เทคนิคการเต้นลีลาศและความเข้าใจในท่าเต้นและจังหวะของเพลงอย่างน้อย 4 จังหวะ อาทิเช่น วอลซ์ ควิกสเต็ป ชะชะซ่าและไจฟ์



Specific Courses (Major Required Courses) provided by the University of Sussex

C7020 Clinical Biochemistry 15

This module outlines the biochemical mechanisms for controlling the pathways of lipid, carbohydrate, and amino acid metabolism under different physiological and nutritional conditions and will discuss the importance of diseases arising from defects in these pathways.

Particular emphasis is placed upon the aetiology, symptoms and treatment of diseases such as:

- type I and II diabetes mellitus
- the obesity epidemic and metabolic syndrome
- hypertension
- atherosclerosis and other lipid disorders
- inborn errors of carbohydrate and amino metabolism.

You discuss a variety of routine biochemical tests, together with their importance for the diagnosis, prognosis, monitoring and screening for disease.

This module consists of lectures, including visiting lecturers with direct experience of the clinical field, online quizzes, a problem class and practicals.

Teaching: 73% Lecture
7% One-to-one tutorial
15% Practical (Laboratory)
5% Seminar (Class)
Assessment: 40% Coursework (Report, Test)
60% Examination (Unseen examination)

C7102 Virology 15

This module introduces the infectious agents that cause common human diseases. The discovery of the infectious agents, and their life-cycles and contribution to the disease process will also be explored. The model will provide the molecular biology underlying the mode of action of current therapeutic strategies, and address - during small-group tutorials - specific aspects of the pathogenesis caused by individual infectious agents.

Teaching: 46% Lecture
38% Practical (Laboratory)
16% Seminar
Assessment: 30% Coursework (Report)
70% Examination (Unseen examination)

C7108 Cell Regulation and Cancer 15

The course aims to introduce students to the mechanisms by which cell metabolism and growth is regulated in normal and diseased states, focussing on cancer. It will cover cell regulation at the level



of single cells and the body as a whole and will discuss the major signal transduction pathways used by hormones, neurotransmitters and growth factors to control cell growth and metabolism in the normal state and also the use of pharmacological agents to discriminate between receptor subtypes. This will lead to a discussion of how loss of control of these signalling pathways by the generation of oncogenes or changes in tumour suppressor genes leads to alterations in the cell cycle and the development of cancer. The difference between normal and transformed cells, the altered signal transduction mechanisms and the epidemiology, incidence and mortality in different cancers are reviewed.

Teaching: 85% Lecture
15% Seminar (Class)
Assessment: 30% Coursework (Test)
70% Examination (Unseen examination)

C7110 Genetics and Genomics

15

This course will cover aspects of both classical and molecular genetics. Starting from the basic principles of Mendelian inheritance and meiosis, the concepts of genetic linkage, recombination and mapping will be introduced. How the understanding of these processes can be used in the analysis of human disease traits will be discussed in detail. The course will then move onto looking at the structure of genomes, again with an emphasis on the human genome and how changes to this structure can relate to human disease. Finally, the course will build on the basic molecular genetics covered in the level 4 molecular biology course to describe the advanced techniques now being used to analyse and manipulate genomes.

Teaching: 65% Lecture
35% Practical (Laboratory)
Assessment: 40% Coursework (Problem set, Report)
60% Examination (Unseen examination)

C7114 Structural Basis of Biological Function

15

This module builds on the topics of protein structure and function relationships introduced by first year modules Fundamentals of Cell and Molecular Biology and Biological Chemistry. Topics covered will include: an introduction to protein structure and folding, methods used to determine high-resolution protein structures, protein superfamilies, the functional properties of enzymes, the methods of analysis for exploring enzyme mechanism, enzyme properties can be modified by protein engineering, techniques to produce new enzymes with desirable properties, illustrated using a case study of subtilisin, the specificity of small molecule enzyme interactions, illustrated using an example of rationale drug design, and the role of proteins as transducers of mechanical energy, explored by considering the role of actin and myosin in muscle contraction.



Teaching: 52% Lecture (Lecture, Post-lab, Pre-lab)
48% Practical (Laboratory, Workshop)
Assessment: 30% Coursework (Report)
70% Examination (Unseen examination)

C7127 Life Sciences Year 3 Research Project (Experimental) 30

This is an individual research project involving the investigation of a biological problem or phenomenon using experimental procedures, or the investigation and evaluation of a medical condition, intervention or treatment using literature-based methods, in addition to patient feedback where possible. You will obtain data and information from either laboratory or field-based experiments; from work performed in silico, or from literature-based research.

Teaching: 56% Practical (Project)
44% Seminar
Assessment: 100% Coursework (Observation, Presentation, Report)

C7137 Medical Microbiology 15

This course aims at providing a comprehensive knowledge of Medical Microbiology and focuses mainly on infection disease agents with the exception of viruses. It covers the discipline of bacteriology, mycology and parasitology. The course will involve lectures on the medically important bacterial pathogens, infections caused by them, virulence, pathogenesis, diagnosis and identification methods, diagnostic microbiology with emphasis on antimicrobial testing, Clinical Microbiology and an introduction to antimicrobial resistance, water testing and bioterrorism. Learning would be facilitated with the help of practical sessions and online feedback and assessment

Teaching: 80% Lecture (Lecture, Post-lab)
7% Practical (Laboratory)
13% Seminar (Class, Seminar)
Assessment: 30% Coursework (Report, Test)
70% Examination (Unseen examination)

C7138 Haematology and Anatomy 15

This course intends to introduce students to two important disciplines in medicine, namely Haematology and Anatomy. It will consist of a series of lectures and practicals to supplement teaching. Lectures in anatomy will cover the various structures in human body and how structures such as muscle, skin, bone, organs, etc. are organized in representative anatomical regions of the body. Students will be given the opportunity to experience dissection at the BSMS.

The haematology lectures aim at providing an in-depth understanding of normal and abnormal haematology. They will include the functions of bone marrow, the different blood cells and their role,



haemostasis, common haematological disorders such as anemias, leukemias, disorders of clotting and a discussion on blood grouping and transfusion. The practicals would cover RBC, WBC count, blood smears, blood grouping and interpretation of routine haematological test.

Teaching: 83% Lecture
15% Practical (Laboratory, Practical)
2% Seminar (Class)
Assessment: 20% Coursework (Test)
80% Examination (Unseen examination)

C7140 Combating Disease

15

The course cover the basic concepts that are essential for a first understanding of contemporary aspects of cellular and molecular immunology at the same time expanding on the modes of action of a range of common therapeutic agents, in terms of their modes of action, receptor/drug targets and associated physiological responses. The students will discuss the role of innate and adaptive immunity in defense mechanisms, and learn how the innate immunity is able to recognise non-self-antigens and the meaning of inflammation. Emphasis will be given to how the structures of the antibody classes are related to their function and how antibody diversity and T-cell receptor diversity are generated. The structure and function of T-cells receptor and major histocompatibility complex will be reviewed. In order to understand T-cell activation, antigens processing and presentation and the function of cytokines networks will be covered. Particular emphasis will be given to how cell mediated and humoral immune responses are coordinated. The course also cover: antibiotics and their mode of action, adrenergic transmission and the use of sympathomimetic agonist and antagonists, and the cardiovascular system and the regulation of blood pressure by the renin angiotensin-aldosterone system.

Teaching: 68% Lecture (Lecture, Post-lab)
32% Practical (Laboratory)
Assessment: 30% Coursework (Report)
70% Examination (Unseen examination)

Specific Courses (Major Elective Courses) provided by the University of Sussex

861C1 Advanced Haematology and Transfusion Science

15

Haematological malignancies are a heterogeneous group of devastating cancers affecting all ages. This unit will describe the molecular processes active in normal haematopoietic development and explain how these mechanisms are disrupted during malignant transformation. Students will learn the techniques commonly adopted in haematological research, and understand the cross-disciplinary investigations performed in diagnostic laboratories to identify blood cancers. Finally, this unit will describe the fundamental concepts of blood transfusion science allowing the student an understanding



of blood grouping and the compatibility testing necessary to select blood products in a clinical setting.

Teaching: 74% Lecture
17% Practical (Laboratory)
9% Seminar (Class)
Assessment: 30% Coursework (Problem set)
70% Examination (Unseen examination)

C1120 Neuronal Transduction and Transmission 15

This module explores aspects of neuronal signalling, in both vertebrates and invertebrates, highlighting how molecular structure relates to function in signalling pathways. The emphasis will be on understanding how molecular and cellular mechanisms underlie the function of the central nervous system at a systems level and the generation of behaviour. The module begins with the problem of sensory transduction (getting information into the nervous system), with a particular emphasis on mechanical (auditory) and visual modalities. This will be followed by a series of lectures on how information is processed at the synapse, covering electrical transmission and preand post-synaptic mechanisms at the chemical synapse. You will also be introduced to non-synaptic information processing.

Teaching: 100% Lecture
Assessment: 25% Coursework (Essay)
75% Examination (Unseen examination)

C1121 Neuronal Plasticity and Gene Regulation 15

This module will consider how cellular and molecular mechanisms interact in the regulation of neuronal plasticity, the ability of the nervous system to adapt its structural-functional organisation to new situations emerging from changes in intrinsic and extrinsic inputs. During the module particular emphasis will be placed on mechanisms underlying the acquisition, processing and storage of information by the nervous system. You will also discuss recently discovered phenomena such as epigenetic regulation and natural antisense transcripts (NATs) in the context of their importance for the regulation of neural functions.

Teaching: 100% Lecture
Assessment: 25% Coursework (Essay)
75% Examination (Unseen examination)

C7117 Innovation in Bioscience and Medicine 15

The purpose of this module is to provide you with an overview of how research in the Life Sciences can lead to innovation in society, and the factors that shape, boost or inhibit such innovation. The module explores the applications of bioscience, particularly in medicine, its products and



processes, and their patterns of development. It examines the mechanisms through which products and services are commercialised, such as university-industry links, spin-off firms and corporate alliances. Wider regulatory and ethical debates and the role they play in the development of biotechnology are also explored.

Teaching: 52% Lecture
48% Seminar
Assessment: 50% Coursework (Essay)
50% Examination (Unseen examination)

C7118 Cell Signalling and its Application in Therapeutics and Disease 15

This module looks at the major signalling pathways in cells and how perturbations of these can result in disease processes such as hypertension, cancer, gigantism, cholera, secretory diarrhea, polycystic kidney disease and septic shock. Students learn how a knowledge of these pathways has led to the design and use of specific pharmacological agents to target these pathways for therapeutic intervention. The signalling pathways covered will include Ca^{2+} , cyclic nucleotides, nitric oxide and guanylate cyclase, MAPK kinase pathways, PI-3-kinase and PKB, Jak/Stat pathways and integrins.

Teaching: 94% Lecture
6% Seminar (Class)
Assessment: 30% Coursework (Test)
70% Examination (Unseen examination)

C7120 Genomics and Bioinformatics 15

This module will introduce the common types of genomic and proteomic data available in biological databases; including DNA and protein sequences, motifs, gene structure, protein interactions and expression profiles. The aims and methods of DNA and protein sequence analysis will be covered, including analysis of homology, identification of motifs and domains, pair-wise and multiple alignments and prediction of gene structure. The practical sessions will include the analysis of DNA and protein sequence data from biological databases. In these sessions you will learn how to integrate data to find the functional links between disease related genes and proteins.

Teaching: 52% Lecture
29% Practical
19% Seminar (Class)
Assessment: 60% Coursework (Group presentation, Report, Take away paper)
40% Examination (Unseen examination)



C7121 Immunology in Health and Disease

15

In this module, there will be an emphasis on the experimental applications of immunology, important for clinical procedures and for basic research. For example, the module will outline methods for the analysis of antigen expression on cells, for the study of hypersensitivity reactions, for cell-mediated cytotoxicity, for vaccine production and clinical analysis of their effects. Also, the development of diagnostic and therapeutic strategies against cancer, graft rejection and autoimmune diseases will be discussed.

Teaching: 71% Lecture
29% Practical (Workshop)
Assessment: 30% Coursework (Group presentation, Project)
70% Examination (Unseen examination)

C7123 Molecular Genetics

15

The module will cover the application of molecular genetics to the study of processes in model systems and higher eukaryotes. Particular topics will include cell cycle and checkpoint control, recombination and mating type switching in lower eukaryotes, gene mapping and cloning disease genes in higher eukaryotes and the production of transgenic plants and animals.

Teaching: 100% Lecture
Assessment: 30% Coursework (Essay, Problem Set)
70% Examination (Unseen examination)

C7124 Protein Form and Function

15

Protein Form and Function provides a sense of how protein structures are related to each other and of how these structures relate to protein function. On this module you will be equipped with the necessary knowledge and skills to learn about and appreciate this class of molecule. This module covers aspects of protein structure in detail and introduces computational and experimental techniques that are essential for studying proteins, and provides the basis for the in depth discussion of more topical issues such as protein engineering and design, protein folding, chaperones and protein folding diseases.

Teaching: 100% Lecture
Assessment: 30% Coursework (Report)
70% Examination (Unseen examination)

C7128 Molecular Pharmacology

15

In this module, you examine the actions of drugs at the molecular level and you analyse the methods employed to study these interactions. These methods include molecular cloning, receptor binding and cell-based functional assays. The focus is receptor binding theory and the effects of drugs



on intracellular signalling pathways. In the module, you study a variety of drug targets in detail, including examples of the G-Protein couple receptor (GPCR), ligand-gated ion channel, neurotransmitter transporter and enzyme facilities. Using GPCRs to exemplify the effects of drugs on second messenger systems (e.g. cyclic AMP, inositol trisphosphate) and related signalling cascades - and the GABA_A receptor is highlighted as a prototypic ligand-gated ion channel.

Teaching: 85% Lecture
15% Seminar (Class)
Assessment: 30% Coursework (Test)
70% Examination (Unseen examination)

C7129 Genome Stability, Genetic Diseases and Cancer

15

The design of new therapies for cancer depends on first understanding the molecular events that cause the disease. Genomic DNA is damaged spontaneously, by chemical carcinogens and by radiation. If unrepaired, this damage leads to mutations, cancer and other developmental disorders. All cells have evolved a sophisticated array of repair and response mechanisms to deal with DNA damage. In this module, you aim to understand the molecular mechanisms that control DNA repair and appreciate how defects in genes involved in these repair processes are associated with different, in many cases cancer-prone, genetic disorders. You will review and critically evaluate recently published experimental evidence, as advances in this area rely on a combination of biochemical analysis, genetic approaches and bioinformatics.

Teaching: 79% Lecture
21% Seminar (Class, Seminar)
Assessment: 30% Coursework (Test)
70% Examination (Unseen examination)

C7131 Post Transcriptional Control of Gene Expression

15

In this module you investigate what happens to a messenger RNA (mRNA) from the time it is synthesised, its subsequent processing, remodelling, export into the cytoplasm and ultimate use to make protein. While the processing of mRNA molecules is highly regulated, particularly at the levels of transcription and splicing (in eukaryotes), it is the translational machinery that allows the cell to: select whether to use the mRNA to make protein at all, decide which proteins to make, and decide how much protein to make and at what time in the cell cycle. This regulation is crucial to enable gene expression to be finely tuned with growth and allow cells to respond to environmental cues derived from hormones and nutrients. You will take an in-depth look at the molecular mechanisms controlling mRNA utilisation and degradation in eukaryotes focusing largely on translational control and what happens if the cell gets it wrong. You will be taught by active researchers providing an up-to-date interpretation of this active and interesting area key to the understanding of growth control and cancer.



Teaching: 94% Lecture
6% Seminar (Class)
Assessment: 30% Coursework (Test)
70% Examination (Unseen examination)

C7132 Regulating the Transcriptome

15

This module takes an up-to-the-minute look at the molecular mechanisms controlling RNA expression in prokaryotes and eukaryotes, focusing largely on gene transcription but also examining RNA processing events in eukaryotes. We will examine the way in which bacteria control gene expression in response to different environmental cues through precisely coordinated transcription regulatory networks, and investigate the way in which eukaryotic transcriptional regulators control RNA polymerase recruitment and retention and modulate chromatin structure during transcriptional activation and repression. Understanding these processes and mechanisms is fundamental for the study of health and disease, for example to aid the development of new antibiotics and decipher how gene regulatory networks are perturbed during cancer development.

Teaching: 65% Lecture
35% Seminar
Assessment: 30% Coursework (Essay)
70% Examination (Unseen examination)

C7143 Structure and Function in the Brain

15

The aim of the module is to reveal the anatomical substrates on which the processing of sensory information and the generation of motor commands depend. Specific attention will be paid to the relationship between structure and function. The module will cover the development of the anatomical features of the nervous system and will give a comparative interpretation of the anatomy of brain regions and their cellular components using a variety of examples including vertebrate and invertebrate models. The module will provide basic knowledge of the main techniques used to study the functional anatomy of the brain at systems, cellular and molecular levels.

Teaching: 61% Lecture
28% Practical (Laboratory)
11% Seminar
Assessment: 30% Coursework (Essay)
70% Examination (Unseen examination)

C7162 Life Sciences Year 3 Research Project (Literature)

30

The overall aim of this module is to allow you to choose a scientific or clinical topic, develop the capacity to survey the scientific literature, critically appraise scientific papers, and produce an



authoritative literature review. They should demonstrate critical appraisal skills necessary to assess the relevance and trustworthiness of published articles; an understanding of scientific techniques, the conduct of research, to appreciate the advantages and disadvantages of various techniques, and evaluate the relative importance of scientific and clinical findings. Writing the literature review will afford the opportunity to advance different and sometimes conflicting arguments, and to propose new avenues for research into the topic.

Teaching: 56% Practical (Project)
44% Seminar

Assessment: 100% Coursework (Dissertation, Observation, Presentation)

C7163 Advanced Human Virology and Bacteriology

15

In the modern era, with the ease of global travel and exposure to new (and re-emerging) pathogens, the study of the transmission, epidemiology and treatment of communicable diseases has never been so important. This module provides a detailed insight into factors determining the public health importance of human viruses and bacteria. There will be a specific focus on the role of epidemiology, vaccine and drug development in the context of these diseases. You will develop a critical approach to contemporary literature on selected diseases, enabling an evaluation of the relative significance of laboratory-based research from various fields.

Teaching: 82% Lecture
18% Seminar

Assessment: 40% Coursework (Essay)
60% Examination (Unseen examination)



Degree ☒ Bachelor ☐ Master ☐ Doctoral
 TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science
 Department of Pathobiology

3.2 Name, Surname, Academic Position, Qualifications, Identification Number of Program Designated Instructors

3.2.1 The Program Instructors In-Charge

No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Most Recent Academic Works in 5 Years
1	Mr.Niwat Kangwanrangsang National ID 310200120xxxx	Lecturer	<ul style="list-style-type: none"> - Ph.D. (Medical Science), Ehime University, Japan, 2013 - M.Sc. (Anatomy), Mahidol University, Thailand, 2004 - B.Sc. (Biology), Mahidol University, Thailand, 1998 	Bertschi NL, Voorberg-van der Wel A, Zeeman AM, Schuier S, Nigsch F, Carbone W, Knehr J, Gupta DK, Hofman SO, van der Werff N, Nieuwenhuis I, Klooster E, Faber BW, Flannery EL, Mikolajczak SA, Chuenchob V, Shrestha B, Beibel M, Bouwmeester T, Kangwanrangsang N , Sattabongkot J, Diagana TT, Kocken CH, Roma G. Transcriptomic analysis reveals reduced transcriptional activity in the malaria parasite <i>Plasmodium cynomolgi</i> during progression into dormancy. <i>Elife</i> . 2018;7. pii: e41081.
2	Mr.Somyoth Sridurongrit National ID 310090000xxxx	Assistant Professor	<ul style="list-style-type: none"> - Ph.D. (Pathobiology), University of Southern California, USA, 2008 - M.Sc. (Biochemistry), University of Southern California, USA, 2004 - B.Sc. (Biochemistry), Chulalongkorn University, Thailand, 1999 	Sridurongrit S , Ke C, Kongphat W, Pudgerd A, Suwannasing C. Abrogation of Alk5 in hepatic stellate cells decreases hepatic fibrosis and ameliorates liver damage in mice following treatment with thioacetamide. <i>Songklanakarin J Sci Techno</i> . 2018;40(3):314-20.
3	Mr.Somphong Narkpinit National ID 313030023xxxx	Lecturer	<ul style="list-style-type: none"> - M.D., Chulalongkorn University, Thailand, 2005 	Tancharoen S, Shakya P, Narkpinit S , Dararat P, Kikuchi K. Anthocyanins extracted from <i>Oryza sativa</i> L. prevent fluorouracil-induced nuclear factor- KB activation in oral mucositis: in vitro and in vivo studies. <i>Int J Mol Sci</i> . 2018;19(10). pii: E2981.


Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Most Recent Academic Works in 5 Years
4	Mr.Tana Taechalertpaisarn National ID 110090000xxxx	Lecturer	- Ph.D. (Medical Parasitology), University of Melbourne, Australia, 2015 - B.Sc. (Biochemistry), Chulalongkorn University, Thailand, 2006	Kennedy AT, Schmidt CQ, Thompson JK, Weiss GE, Taechalertpaisarn T , Gilson PR, et al. Recruitment of Factor H as a novel complement evasion strategy for blood-stage <i>Plasmodium</i> <i>falciparum</i> infection. J Immunol. 2016;196(3):1239-48.
5	Mr.Thaned Kangsamaksin National ID 352990003xxxx	Assistant Professor	- Ph.D. (Pathobiology and Molecular Medicine), Columbia University, USA, 2011 - M.A., M.Phil. (Pathobiology and Molecular Medicine), Columbia University, USA, 2008 - B.A. (Biochemistry), Columbia University, USA, 2005	Singrang N, Kittisenachai S, Roytrakul S, Svasti J, Kangsamaksin T . NOTCH1 regulates the viability of cholangiocarcinoma cells via 14-3-3 theta. J Cell Commun Signal. 2019;13(2):245-54.

3.2.2 The Program Instructors

No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
1	Ms.Charoensri Thonabulsombat	Associate Professor	Ph.D. (Reproductive Biology), Utah State University, USA M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Nursing), Mahidol University, Thailand	Department of Anatomy	Gonmanee T, Thonabulsombat C , Vongsavan K, Sritanaudomchai H. Differentiation of stem cells from human deciduous and permanent teeth into spiral ganglion neuron-like cells. Arch Oral Biol. 2018;88:34-41.
2	Ms.Kanokpan Wongprasert	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Physical therapy), Mahidol University, Thailand	Department of Anatomy	Karnjana K, Soowannayan C, Wongprasert K . Ethanolic extract of red seaweed <i>Gracilaria fisheri</i> and furanone eradicate <i>Vibrio harveyi</i> and <i>Vibrio parahaemolyticus</i> biofilms and ameliorate the bacterial infection in shrimp. Fish Shellfish Immunol. 2019;88:91-101.
3	Ms.Kulathida Chaithirayanon	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Physical therapy), Mahidol University, Thailand	Department of Anatomy	Sangpairoj K, Apisawetakan S, Changklungmoa N, Kueakhai P, Chaichanasak P, Sobhon P, Chaithirayanon K . Potential of recombinant 2-Cys peroxiredoxin protein as a vaccine for <i>Fasciola</i> <i>gigantica</i> infection. Exp Parasitol. 2018;194:16-23.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
4	Mr.Krai Meemon	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand B.Sc. (Physical therapy), Mahidol University, Thailand	Department of Anatomy	Malaiwong N, Chalorak P, Jattujan P, Manohong P, Niamnont N, Suphamungmee W, Sobhon P, Meemon K . Anti-Parkinson activity of bioactive substances extracted from <i>Holothuria leucospilota</i> . Biomed Pharmacother. 2019;109:1967-77.
5	Ms.Somluk Asuvapongpatana	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Nursing), Mahidol University, Thailand	Department of Anatomy	Timklay W, Magerd S, Sato C, Somrit M, Watthammawut A, Senarai T, Weerachayanukul W, Kitajima K, Asuvapongpatana S . N-linked mannose glycoconjugates on shrimp thrombospondin, pmTSP-II, and their involvement in the sperm acrosome reaction. Mol Reprod Dev. 2019; 86(4):440-9.
6	Mr.Wattana Weerachayanukul	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Physical Therapy), Mahidol University, Thailand	Department of Anatomy	Jariyapong P, Pudgerd A, Cheloh N, Hirono I, Kondo H, Vanichviriyakit R, Weerachayanukul W , et al. Hematopoietic tissue of <i>Macrobrachium rosenbergii</i> plays dual roles as a source of hemocyte hematopoiesis and as a defensive mechanism against <i>Macrobrachium rosenbergii</i> nodavirus infection. Fish Shellfish Immunol. 2019;86:756-63.
7	Mr.Yotsawan Tinikul	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Zoology), Chiang Mai University, Thailand	Department of Anatomy	Khornchatri K, Saetan J, Thongbuakaew T, Senarai T, Kruangkum T, Kornthong N, Tinikul Y , et al. Distribution of abalone egg-laying hormone-like peptide in the central nervous system and reproductive tract of the male mud crab, <i>Scylla olivacea</i> . Acta Histochem. 2019;121(2):143-50.
8	Mr.Chinnawut Suriyonplengsaeng	Assistant Professor	Diploma of Thai Board of Pathology in Anatomic Pathology M.D., Mahidol University, Thailand	Department of Anatomy	Suriyonplengsaeng C , Dejthepaporn C, Khongkhatithum C, Sanpapant S, Tubthong N, Pinradap K, et al. Immunohistochemistry of sarcolemmal membrane-associated proteins in formalin-fixed and paraffin-embedded skeletal muscle tissue: a promising tool for the diagnostic evaluation of common muscular dystrophies. Diagn Pathol. 2017;12(1):19.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
9	Ms.Morakot Sroyraya	Assistant Professor	Ph.D. (Anatomy and Structural Biology), Mahidol University, Thailand. B.Sc. (Medical Technology), Thammasat University, Thailand	Department of Anatomy	Sroyraya M , Kaewphalug W, Anantachoke N, Poomtong T, Sobhon P, Srimongkol A, et al. Saponins enriched in the epidermal layer of <i>Holothuria leucospilota</i> body wall. Microsc Res Tech. 2018;81(10):1182-90.
10	Mr.Nopporn Jongkamonwiwat	Assistant Professor	Ph.D. (Neuroscience), Mahidol University, Thailand B.Sc. (Physical Therapy), Srinakharinvirot University, Thailand	Department of Anatomy	Krityakiarana W, Sompup K, Jongkamonwiwat N , Mukda S, Pinilla FG, Govitrapong P, et al. Effects of melatonin on severe crush spinal cord injury-induced reactive astrocyte and scar formation. J Neurosci Res. 2016;94(12):1451-9.
11	Ms.Rapeepun Vanichviriyakit	Assistant Professor	Ph.D. (Anatomy), Mahidol University, Thailand B.Sc. (Physical Therapy), Srinakharinvirot University, Thailand	Department of Anatomy	Pudgerd A, Chotwiwatthanakun C, Kruangkum T, Itsathitphaisarn O, Sritunyalucksana K, Vanichviriyakit R . The hematopoietic organ of <i>Macrobrachium rosenbergii</i> : Structure, organization and immune status. Fish Shellfish Immunol. 2019;88:415-23.
12	Mr.Somyoth Sridurongrit	Assistant Professor	Ph.D. (Pathobiology), University of Southern California, USA M.Sc. (Biochemistry and Molecular Biology), University of Southern California, USA B.Sc. (Biochemistry), Chulalongkorn University, Thailand	Department of Anatomy	Sridurongrit S , Ke C, Kongphat W, Pudgerd A, Suwannasing C. Abrogation of Alk5 in hepatic stellate cells decreases hepatic fibrosis and ameliorates liver damage in mice following treatment with thioacetamide. Songklanakarin J Sci Techno. 2018;40(3):314-20.
13	Mr.Worawit Suphamungmee	Assistant Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Radiological Technology), Chiang Mai University, Thailand	Department of Anatomy	Malaiwong N, Chalorak P, Jattujan P, Manohong P, Niamnont N, Suphamungmee W , Sobhon P, Meemon K. Anti-Parkinson activity of bioactive substances extracted from <i>Holothuria leucospilota</i> . Biomed Pharmacother. 2019;109:1967-77.
14	Ms.Monsicha Somrit	Lecturer	Ph.D. (Anatomy), Mahidol University, Thailand B.Sc. (Physical therapy), Chiang Mai University, Thailand	Department of Anatomy	Timklay W, Magerd S, Sato C, Somrit M , Watthammawut A, Senarai T, et al. N-linked mannose glycoconjugates on shrimp thrombospondin, pmTSP-II, and their involvement in the sperm acrosome reaction. Mol Reprod Dev. 2019;86 (4):440-9.


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15	Mr.Sittipon Intarapat	Lecturer	Ph.D. (Developmental Biology and Stem Cell Biology), University College London, UK M.Sc. (Zoology), Chulalongkorn University, Thailand B.Sc. (Biology), Prince of Songkla University, Thailand	Department of Anatomy	Jean C, Oliveira NM, Intarapat S , Fuet A, Mazoyer C, De Almeida I, et al. Transcriptome analysis of chicken ES, blastodermal and germ cells reveals that chick ES cells are equivalent to mouse ES cells rather than EpiSC. Stem Cell Res. 2015;14 (1):54-67.
16	Mr.Thanapong Kruangkum	Lecturer	Ph.D. (Anatomy), Mahidol University, Thailand B.Sc. (Biology), Chiang Mai University, Thailand	Department of Anatomy	Pudgerd A, Chotwiwatthanakun C, Kruangkum T , Itsathitphaisarn O, Sritunyalucksana K, Vanichviriyakit R. The hematopoietic organ of <i>Macrobrachium rosenbergii</i> : Structure, organization and immune status. Fish Shellfish Immunol. 2019;88:415-23.
17	Mr.Sarawut Jitrapakdee	Professor	Ph.D. (Biochemistry), University of Adelaide, Australia M.Sc. (Biochemistry), Mahidol University, Thailand B.Sc. (Biology), Mahidol University, Thailand	Department of Biochemistry	Adina-Zada A, Jitrapakdee S , Attwood PV. Characterization of the kinetics and activation thermodynamics of intra- and inter-organism hybrid tetramers of pyruvate carboxylase. Arch Biochem Biophys. 2019;665:87-95.
18	Mr.Jirundon Yuvaniyama	Associate Professor	Ph.D. (Biological Chemistry), University of Michigan, USA B.Sc. (Chemistry), Mahidol University, Thailand	Department of Biochemistry	Boonyalai N, Sittikul P, Yuvaniyama J . <i>Plasmodium falciparum</i> Plasmepsin V (PfPMV): Insights into recombinant expression, substrate specificity and active site structure. Mol Biochem Parasitol. 2015;201(1):5-15.
19	Mr.Kittisak Yokthongwattana	Associate Professor	Ph.D. (Agricultural & Environmental Chemistry), University of California (Berkeley), USA B.S. (Biology), Rensselaer Polytechnic Institute, USA	Department of Biochemistry	Traewachiwiphak S, Yokthongwattana C, Ves-Urai P, Charoensawan V, Yokthongwattana K . Gene expression and promoter characterization of heat-shock protein 90B gene (HSP90B) in the model unicellular green alga <i>Chlamydomonas reinhardtii</i> . Plant Sci. 2018;272:107-16.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
20	Mr.Laran T. Jensen	Associate Professor	Ph.D. (Biochemistry), University of Utah, USA B.Sc. (Chemistry, Physics, and Mathematics), Westminster College, USA	Department of Biochemistry	Aung HM, Huangteerakul C, Panvongsa W, Jensen AN, Chairoungdua A, Sukrong S, Jensen LT . Interrogation of ethnomedicinal plants for synthetic lethality effects in combination with deficiency in the DNA repair endonuclease RAD1 using a yeast cell-based assay. J Ethnopharmacol. 2018;223:10-21.
21	Ms.Rutaiwan Tohtong	Associate Professor	Ph.D. (Molecular Genetics), Ohio State University, USA B.Sc. (Microbiology), Chulalongkorn University, Thailand	Department of Biochemistry	Myint KZ, Kongpracha P, Rattanasinganchan P, Leelawat K, Moolthiya P, Chaiyabutr K, Tohtong R . Gadd45 β silencing impaired viability and metastatic phenotypes in cholangiocarcinoma cells by modulating the EMT pathway. Oncol Lett. 2018;15(3):3031-41.
22	Mr.Tavan Janvilisri	Associate Professor	Ph.D. (Pharmacology), University of Cambridge, UK M.Sc. (Oncology), University of Nottingham, UK B.Sc. (Biochemistry and Genetics), University of Nottingham, UK	Department of Biochemistry	Harnvoravongchai P, Chankhamhaengdech S, Ounjai P, Singhakaew S, Boonthaworn K, Janvilisri T . Antimicrobial effect of asiatic acid against <i>Clostridium difficile</i> is associated with disruption of membrane permeability. Front Microbiol. 2018;9:2125.
23	Ms.Tuangporn Suthiphongchai	Associate Professor	Ph.D. (Biochemistry), Mahidol University Post-Graduate Diploma (Biotechnology), International Inst. In Biotechnology Studies, UK B.Pharm. (Pharmacy), Mahidol University, Thailand	Department of Biochemistry	Sritanauwat P, Sueangoen N, Thummarati P, Islam K, Suthiphongchai T . Blocking ERK1/2 signaling impairs TGF- β 1 tumor promoting function but enhances its tumor suppressing role in intrahepatic cholangiocarcinoma cells. Cancer Cell Int. 2017;17:85.
24	Ms.Danaya Pakotiprapha	Assistant Professor	Ph.D. (Biochemistry), Harvard University, USA A.M. (Biology), Harvard University, USA B.A. (Biochemistry), Chulalongkorn University, Thailand	Department of Biochemistry	Chase J, Catalano A, Noble AJ, Eng ET, Olinas PD, Molloy K, Pakotiprapha D , et al. Mechanisms of opening and closing of the bacterial replicative helicase. Elife. 2018 Dec 24;7. pii: e41140.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
25	Mr.Jamorn Somana	Assistant Professor	Ph.D. (Plant Biochemistry), University of Cambridge, UK M.D., Mahidol University, Thailand	Department of Biochemistry	Phoeurk C, Somana J , Sornwatana T, Udompaisarn S, Traewachiwiphak S, Sirichaiyakul P, et al. Three novel mutations in α -galactosidase gene involving in galactomannan degradation in endosperm of curd coconut. <i>Phytochemistry</i> . 2018;156: 33-42.
26	Ms.Kanlaya Prapainop	Assistant Professor	Ph.D. (Biochemistry), University of Oxford, UK B.Sc. (Chemistry), Mahidol University, Thailand	Department of Biochemistry	Mekseriwattana W, Srisuk S, Kriangsaksri R, Niamsiri N, Prapainop K . The impact of serum proteins and surface chemistry on magnetic nanoparticle colloidal stability and cellular uptake in breast cancer cells. <i>APS Pharm Sci Tech</i> . 2019;20(2):55.
27	Ms.Kornkamon Lertsuwan	Assistant Professor	Ph.D. (Biological Science), University of Delaware, USA M.Sc. (Biology), Khon Kaen University, Thailand B.Sc. (Biology), Khon Kaen University, Thailand	Department of Biochemistry	Lertsuwan K , Nammultriputtar K, Nanthawuttiaphan S, Phoaubon S, Lertsuwan J, Thongbunchoo J, et al. Ferrous and ferric differentially deteriorate proliferation and differentiation of osteoblast-like UMR-106 cells. <i>Biometals</i> . 2018;31(5):873-89.
28	Ms.Ornchuma Itsathitphisarn	Assistant Professor	Ph.D. (Molecular Biophysics and Biochemistry), Yale University, USA M. Biochem. (Biochemistry), University of Oxford, UK	Department of Biochemistry	Pudgerd A, Chotwiwatthanakun C, Kruangkum T, Itsathitphisarn O , Sritunyalucksana K, Vanichviriyakit R. The hematopoietic organ of <i>Macrobrachium rosenbergii</i> : Structure, organization and immune status. <i>Fish Shellfish Immunol</i> . 2019;88:415-23.
29	Ms.Ruchanok Tinikul	Assistant Professor	Ph.D. (Biochemistry), Mahidol University, Thailand M.Sc. (Biotechnology), Chiang Mai University, Thailand B.Sc. (Biochemistry and Biochemical Technology), Chiang Mai University, Thailand	Department of Biochemistry	Phonbuppha J, Maenpuen S, Munkajohnpong P, Chaiyen P, Tinikul R . Selective determination of the catalytic cysteine pK _a of two-cysteine succinic semialdehyde dehydrogenase from <i>Acinetobacter baumannii</i> using burst kinetics and enzyme adduct formation. <i>FEBS J</i> . 2018;285(13):2504-19.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
30	Mr.Thaned Kangsamaksin	Assistant Professor	Ph.D. (Pathobiology & Molecular Medicine), Columbia University, USA M.Phil. (Pathobiology & Molecular Medicine), Columbia University, USA M.A. (Pathobiology & Molecular Medicine), Columbia University, USA B.A. (Biochemistry), Columbia University, USA	Department of Biochemistry	Singrang N, Kittisenachai S, Roytrakul S, Svasti J, Kangsamaksin T . NOTCH1 regulates the viability of cholangiocarcinoma cells via 14-3-3 theta. J Cell Commun Signal. 2019;13(2):245-54.
31	Mr.Varodom Charoensawan	Assistant Professor	Ph.D. (Molecular Biology), Cambridge University, UK M.Phil. (Computational Biology), Cambridge University, UK B.Eng. (Biochemical Engineering), University College London, UK	Department of Biochemistry	Kitdumrongthum S, Metheetrairut C, Charoensawan V , Ounjai P, Janpipatkul K, Panvongsa W, et al. Dysregulated microRNA expression profiles in cholangiocarcinoma cell-derived exosomes. Life Sci. 2018; 210:65-75.
32	Mr.Mikhail Khvotchev	Lecturer	Ph.D. (Biochemistry), Shemyakin and Ovchinnikov Institute for Biorganic Chemistry, Russian Academy of Sciences, Russia Magna cum laude B.S., M.S. (Biororganic Chemistry and Biology), Lomonosov Moscow State University, Russia	Department of Biochemistry	Lui P, Khvotchev M , Li YC, Chanaday NL, Kavalali ET. Copine-6 binds to SNAREs and selectively suppresses spontaneous neurotransmission. J Neurosci. 2018;38(26):5888-99.
33	Mr.Patompon Wongtrakoongate	Lecturer	Ph.D. (Biomedical Science), University of Sheffield, UK B.Sc. (Biology), Mahidol University, Thailand	Department of Biochemistry	Srisanga K, Suthapot P, Permsirivisarn P, Govitrapong P, Tungpradabkul S, Wongtrakoongate P . Polyphosphate kinase 1 of <i>Burkholderia pseudomallei</i> controls quorum sensing, RpoS and host cell invasion. J Proteomics. 2019;194:14-24.
34	Mr.Sittinan Chanarat	Lecturer	Ph.D. (Biochemistry), University of Munich, Germany M.Eng. (Biological Information), Tokyo Institute of Technology, Japan B.Eng. (Bioengineering), Tokyo Institute of Technology, Japan	Department of Biochemistry	Chanarat S , Mishra SK. Emerging roles of ubiquitin-like proteins in pre-mRNA splicing. Trends Biochem Sci. 2018;43(11):896-907.
35	Ms.Waraporn Komyod	Lecturer	Ph.D. (Biochemistry), RWTH Aachen University, Germany M.Sc. (Biochemistry), Bielefeld University, Germany	Department of Biochemistry	Wasuworawong K, Roytrakul S, Paemanee A, Jindapornprasert K, Komyod W . Comparative proteomic analysis of human cholangiocarcinoma cell lines: S100A2 as a potential candidate protein inducer of invasion. W. Dis Markers. 2015;2015:629367.



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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
36	Mr.Pongsak Utaisincharoen	Professor	Ph.D. (Biochemistry), Colorado State University, USA B.Sc. (Medical Technology), Mahidol University, Thailand	Department of Microbiology	Pudla M, Srisatjaluk R, Utaisincharoen P . Induction of inducible nitric oxide synthase (iNOS) in <i>Porphyromonas gingivalis</i> LPS-treated mouse macrophage cell line (RAW264.7) requires Toll-like receptor 9. <i>Inflamm Res</i> . 2018;67(9):723-6.
37	Mr.Prasit Palittapongarnpim	Professor	Dip. (Thai Board of Pediatrics), Chiang Mai University, Thailand M.D. (Hons), Mahidol University, Thailand B.Sc. (Medical Science), Mahidol University, Thailand B.Sc. (Mathematics), Ramkhamhaeng University, Thailand	Department of Microbiology	Chamchod F, Palittapongarnpim P . Modeling <i>Clostridium difficile</i> in a hospital setting: control and admissions of colonized and symptomatic patients. <i>Theor Biol Med Model</i> . 2019;16(1):2.
38	Ms.Marisa Ponpuak	Associate Professor	Ph.D. (Molecular Cell Biology), Washington University School of Medicine, USA B.Sc. (Molecular Biology), University of Wisconsin-Madison, USA	Department of Microbiology	Bunthitsakda W, Leelayuwapan H, Paha J, Kangwanrangsan N, Chawengkirttikul R, Ponpuak M , et al. Controlled rapid synthesis and in vivo immunomodulatory effects of LM $\alpha(1,6)$ mannan with an amine linker. <i>Carbohydr Polym</i> . 2018;195:420-31.
39	Ms.Ponpan Matangkasombut Choopong	Associate Professor	S.D. (Immunology and Infectious Diseases), Harvard University, USA American Board of Allergy Immunology, USA American Board of Internal Medicine, USA M.D., Chulalongkorn University, Thailand	Department of Microbiology	Opasawatchai A, Amornsupawat P, Jiravejchakul N, Chan-In W, Spoerk NJ, Manopwisedjaroen K, Singhasivanon P, Yingtaweek S, Suraamornkul S, Mongkolsapaya J, Sakuntabhai A, Matangkasombut P , Loison F. Neutrophil activation and early features of NET formation are associated with Dengue virus infection in human. <i>Front Immunol</i> . 2019;9:3007.
40	Ms.Sureemas Buates	Associate Professor	Ph.D. (Molecular Parasitology), McGill University, Canada M.Sc. (Tropical Medicine), Mahidol University, Thailand B.Sc. (Medical Technology), Mahidol University, Thailand	Department of Microbiology	Sattabongkot J, Suansomjit C, Nguitragool W, Sirichaisinthop J, Warit S, Tiensuwan M, Buates S . Prevalence of asymptomatic <i>Plasmodium</i> infections with sub-microscopic parasite densities in the northwestern border of Thailand: a potential threat to malaria elimination. <i>Malar J</i> . 2018;17(1):329.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
41	Mr.Fabien Loison	Assistant Professor	Ph.D. (Cellular Biology), Universite de Rennes 1, France M.Sc. (Biology and Health), University of Rennes 1, France B.Sc. (Biology, Cellular Biology and Physiology), University of Rennes 1, France	Department of Microbiology	Opasawatchai A, Amornsupawat P, Jiravejchakul N, Chan-In W, Spoerk NJ, Manopwisedjaroen K, Singhasivanon P, Yingtaweesak T, Suraamornkul S, Mongkolsapaya J, Sakuntabhai A, Matangkasombut P, Loison F . Neutrophil activation and early features of NET formation are associated with Dengue virus infection in human. <i>Front Immunol</i> . 2019;9:3007.
42	Ms.Saowakon Paca-uccaralertkun	Assistant Professor	Ph.D. (Biochemistry), Attila Jozsef University, Szeged, Hungary M.Sc. (Biochemistry), Chulalongkorn University, Thailand B.Sc. (Radiological Technology), Mahidol University, Thailand	Department of Microbiology	Tochareontanaphol C, Sinthuwiwat T, Buathong B, Thita T, Promso S, Paca-Uccaralertkun S . New mutations of the ID1 gene in acute myeloid leukemia patients. <i>Pathobiology</i> . 2015;82(1):43-7.
43	Ms.Soraya Chaturongakul	Assistant Professor	Ph.D. (Microbiology), Cornell University, USA M.Sc. (Bacteriology), University of Wisconsin-Madison, USA B.Sc. (Genetics), University of Wisconsin-Madison, USA	Department of Microbiology	Nilchan N, Phetsang W, Nowwarat T, Chaturongakul S , Jiarpinitnun C. Halogenated trimethoprim derivatives as multidrug-resistant <i>Staphylococcus aureus</i> therapeutics. <i>Bioorg Med Chem</i> . 2018;26(19):5343-8.
44	Mr.Suthep Wiyakrutta	Assistant Professor	Ph.D. (Microbiology), Mahidol University, Thailand M.Sc. (Pharm Analysis), University of Strathclyde, UK B.Pharm., Mahidol University, Thailand	Department of Microbiology	Jomrit J, Isarangkul D, Summpunn P, Wiyakrutta S . A kinetic spectrophotometric method for the determination of pyridoxal-5'-phosphate based on coenzyme activation of apo-d-phenylglycine aminotransferase. <i>Enzyme Microb Technol</i> . 2018;117:64-71.
45	Mr.Pakorn Aiewsakun	Lecturer	D.Phil. (Zoology), University of Oxford, UK M.Sc. (Bioinformatics and Theoretical Systems Biology), Imperial College, UK B.Sc. (Biological Science), Imperial College, UK	Department of Microbiology	Simmonds P, Aiewsakun P , Katzourakis A. Prisoners of war - host adaptation and its constraints on virus evolution. <i>Nat Rev Microbiol</i> . 2019;17(5):321-8.
46	Ms.Radeekorn Akkarawongsapat	Lecturer	Ph.D. (Cellular and Molecular Biology), University of Wisconsin-Madison, USA B.Sc. (Bacteriology), University of Wisconsin-Madison, USA B.Sc. (Genetics), University of Wisconsin-Madison, USA	Department of Microbiology	Pailee P, Kuhakarn C, Sangsuwan C, Hongthong S, Piyachaturawat P, Suksen K, Jariyawat S, Akkarawongsapat R , et al. Anti-HIV and cytotoxic biphenyls, benzophenones and xanthenes from stems, leaves and twigs of <i>Garcinia speciosa</i> . <i>Phytochemistry</i> . 2018;147: 68-79.


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47	Mr.Tana Taechalertpaisarn	Lecturer	Ph.D. (Medical Parasitology), The University of Melbourne, Australia B.Sc. (Biochemistry), Chulalongkorn University, Thailand	Department of Microbiology	Kennedy AT, Schmidt CQ, Thompson JK, Weiss GE, Taechalertpaisarn T , Gilson PR, et al. Recruitment of factor H as a novel complement evasion strategy for blood-stage <i>Plasmodium falciparum</i> infection. J Immunol. 2016;196(3):1239-48.
48	Mr.Prasit Suwannalert	Associate Professor	Ph.D. (Pathobiology), Mahidol University, Bangkok, Thailand M.Sc. (Medical Biochemistry), Khon Kaen University, Thailand B.Sc. (Medical Technology), Naresuan University, Thailand	Department of Pathobiology	Aimvijarn P, Palipoch S, Okada S, Suwannalert P . Thai Water Lily extract induces B16 melanoma cell apoptosis and inhibits cellular invasion through the role of cellular oxidants. Asian Pac J Cancer Prev. 2018;19(1):149-53.
49	Ms.Wanee Jiraungkoorskul	Associate Professor	Ph.D. (Biology), Mahidol University, Thailand M.Sc. (Physiology), Mahidol University, Thailand B.Sc. (Medical Technology), Mahidol University, Thailand	Department of Pathobiology	Senarat S, Kettratad J, Kangwanransan N, Jiraungkoorskul W , Amano M, Shimizu A, et al. The sbGnRH-GTH system in the female short mackerel, <i>Rastrelliger brachysoma</i> (Bleeker, 1851), during breeding season: implications for low gamete production in captive broodstock. Fish Physiol Biochem. 2019;45(1):1-18.
50	Ms.Amornrat Jensen	Assistant Professor	Ph.D. (Toxicology), Johns Hopkins University, USA B.Sc. (Pharmaceutical Sciences), Chulalongkorn University, Thailand	Department of Pathobiology	Aung HM, Huangteerakul C, Panvongsa W, Jensen AN , Chairoungdua A, Sukrong S, et al. Interrogation of ethnomedicinal plants for synthetic lethality effects in combination with deficiency in the DNA repair endonuclease RAD1 using a yeast cell-based assay. J Ethnopharmacol. 2018;223:10-21.
51	Ms.Pornthip Chaichompoo	Assistant Professor	Ph.D. (Immunology), Mahidol University, Thailand M.Sc. (Immunology), Mahidol University, Thailand B.Sc. (Medical Technology), Chiang Mai University, Thailand	Department of Pathobiology	Manakeng K, Prasertphol P, Phongpao K, Chuncharunee S, Tanyong D, Worawichawong S, Svasti S, Chaichompoo P. Elevated levels of platelet- and red cell-derived extracellular vesicles in transfusion-dependent β -thalassemia/HbE patients with pulmonary arterial hypertension. Ann Hematol. 2019;98(2):281-8.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
52	Ms.Nisamanee Charoenchon	Lecturer	Ph.D. (Medicine), The University of Manchester, UK M.Sc. (Biotechnology), Chulalongkorn University, Thailand B.Sc. (Biology), Khon Kaen University, Thailand	Department of Pathobiology	Charoenchon N , Rhodes LE, Pilkington SM, Farrar MD, Watson REB. Differential reorganisation of cutaneous elastic fibres: a comparison of the in vivo effects of broadband ultraviolet B versus solar simulated radiation. Photochem Photobiol Sci. 2018;17(7):889-95.
53	Mr.Niwat Kangwanrangsan	Lecturer	Ph.D. (Medical Science), Ehime University, Japan M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Biology), Mahidol University, Thailand	Department of Pathobiology	Bertschi NL, Voorberg-van der Wel A, Zeeman AM, Schuier S, Nigsch F, Carbone W, Knehr J, Gupta DK, Hofman SO, van der Werff N, Nieuwenhuis I, Klooster E, Faber BW, Flannery EL, Mikolajczak SA, Chuenchob V, Shrestha B, Beibel M, Bouwmeester T, Kangwanrangsan N , et al. Transcriptomic analysis reveals reduced transcriptional activity in the malaria parasite <i>Plasmodium cynomolgi</i> during progression into dormancy. Elife. 2018;7. pii: e41081.
54	Mr.Somphong Narkpinit	Lecturer	M.D., Chulalongkorn University, Thailand	Department of Pathobiology	Tancharoen S, Shakya P, Narkpinit S , Dararat P, Kikuchi K. Anthocyanins extracted from <i>Oryza sativa</i> L. prevent fluorouracil-induced nuclear factor- κ B activation in oral mucositis: in vitro and in vivo studies. Int J Mol Sci. 2018;19(10). pii: E2981.
55	Ms.Titipatima Sakulterdkiat	Lecturer	Ph.D. (Pathobiology), Mahidol University, Thailand B.Sc. (Molecular Cell Biology), California State University, USA	Department of Pathobiology	Doungchawee G, Sutdan D, Niwatayakul K, Inwisai T, Sitthipunya A, Boonsathorn N, Sakulterdkiat T , et al. Development and evaluation of an immunochromatographic assay to detect serum anti-leptospiral lipopolysaccharide IgM in acute leptospirosis. Sci Rep. 2017;7(1):2309.
56	Ms.Witchuda Payuhakrit	Lecturer	Ph.D. (Pathobiology), Mahidol University, Thailand B.Sc. (Medical Technology), Walailak University, Thailand	Department of Pathobiology	Suwannalert P, Payuhakrit W , Koomsang T. Anti-oxidant, pro-oxidant and anti-inflammatory effects of unpolished rice relevant to colorectal cancer. Asian Pac J Cancer Prev. 2016;17(12):5047-56.


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57	Ms.Yaowarin Nakornpakdee	Lecturer	Ph.D. (Medical Microbiology), Khon Kaen University, Thailand M.Sc. (Medical Microbiology), Khon Kaen University, Thailand B.Sc. (Biology), Khon Kaen University, Thailand	Department of Pathobiology	Nakornpakdee Y , Sermswan RW, Maneewatcharangsri S, Wongratanacheewin S. Hamster IFN- γ +CD4+ and IL-4+CD4+ T cell responses against leptospire are significantly higher than those of mice. Asian Pac J Allergy Immunol. 2018;36(4):265-72.
58	Ms.Darawan Pinthong	Associate Professor	Ph.D. (Pharmacology), University of Nottingham, UK M.Sc. (Pharmacology), Mahidol University, Thailand B.Sc. (General Science), Chulalongkorn University, Thailand	Department of Pharmacology	Tungmunthum D, Pinthong D , Hano C. Flavonoids from <i>Nelumbo nucifera Gaertn.</i> , a medicinal plant: uses in traditional medicine, phytochemistry and pharmacological activities. Medicines. 2018;5(4):127.
59	Ms.Nattinee Jantaratnotai	Associate Professor	Dip. (Psychiatry), Ramathibodi Hospital, Mahidol University, Thailand Ph.D. (Pharmacology), Mahidol University, Thailand M.D. (Medicine), Siriraj Hospital, Mahidol University, Thailand B.Sc. (Medical Science), Mahidol University, Thailand	Department of Pharmacology	Puangsa-Ard Y, Thaweboon S, Jantaratnotai N , Pachimsawat P. Effects of reesterilization and storage time on sterility of paper/plastic pouches. Eur J Dent. 2018;12(3):417-21.
60	Ms.Noppawan Phumala Morales	Associate Professor	Ph.D. (Pharmaceutical Science), Kyushu University, Japan M.Sc. (Pharmacology), Mahidol University, Thailand B.Sc. (Chemistry), Mahidol University, Thailand	Department of Pharmacology	Saitawee D, Teerakapong A, Morales NP , Jitprasertwong P, Hormdee D. Photodynamic therapy of <i>Curcuma longa</i> extract stimulated with blue light against Aggregatibacter actinomycetemcomitans. Photodiagn Photodyn Ther. 2018;22:101-5.
61	Ms.Ruedee Hemstapat	Associate Professor	Ph.D. (Pharmacy), The University of Queensland, Australia B.Sc. (Pharm), Rangsit University, Thailand	Department of Pharmacology	Tawonsawatruk T, Sriwatananukulkit O, Himakhun W, Hemstapat W . Comparison of pain behaviour and osteoarthritis progression between anterior cruciate ligament transection and osteochondral injury in rat models. Bone Jt Res. 2018;7(3):244-51.
62	Ms.Pimtip Sanvarinda	Assistant Professor	Ph.D. (Pharmacology and Toxicology), University of California, USA M.D. Mahidol University, Thailand	Department of Pharmacology	Amnuaycheewa P, Rodiahwati W, Sanvarinda P , Cheenkachorn K, Tawai A, Sriariyanun M. Effect of organic acid pretreatment on Napier grass (<i>Pennisetum purpureum</i>) straw biomass conversion. KMUTNB Int J Appl Sci Technol. 2017;10(2).


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
63	Mr.Pansakorn Tanratana	Lecturer	Ph.D. (Cellular and Molecular Pathology), University of Madison-Wisconsin, USA M.D., Mahidol University, Thailand	Department of Pharmacology	Tanratana P , Ellery P, Westmark P, Mast AE, Sheehan JP. Elevated plasma factor IXa activity in premenopausal women on hormonal contraception. <i>Arterioscler Thromb Vasc Biol.</i> 2018;38(1):266-74.
64	Ms.Pornnipa Korprasertthaworn	Lecturer	Ph.D. (Pharmacology), Mahidol University, Thailand M.Sc. (Pharmacology), Mahidol University, Thailand B.Sc. (Chemistry), Kasetsart University, Thailand	Department of Pharmacology	Polasek TM, Tucker GT, Sorch MJ, Wiese MD, Mohan T, Rostami-Hodjegan A, Korprasertthaworn P , et al. Prediction of olanzapine exposure in individual patients using physiologically based pharmacokinetic modelling and simulation. <i>Br J Clin Pharmacol.</i> 2018;84(3):462-76.
65	Mr.Somchai Yanrojana	Lecturer	Ph.D. (Pharmacology), Mahidol University, Thailand M.D., Mahidol University, Thailand	Department of Pharmacology	Sillapapongwarakorn S, Yanarojana S , Pinthong D, Thithapandha A, Ungwitayatorn J, Supavilai P. Molecular docking based screening of triterpenoids as potential G-quadruplex stabilizing ligands with anti-cancer activity. <i>Bioinformation.</i> 2017;23(9):284-92.
66	Ms.Somrudee Reabroi	Lecturer	Ph.D. (Physiology), Mahidol University, Thailand B.Sc. (Pharmaceutical Science), Ubon Ratchathani University, Thailand	Department of Pharmacology	Reabroi S , Saeeng R, Boonmuen N, Kasemsuk T, Saengsawang W, Suksen K, et al. The anti-cancer activity of an andrographolide analogue functions through a GSK-3 β -independent Wnt/ β -catenin signaling pathway in colorectal cancer cells. <i>Sci Rep.</i> 2018;8(1):7924.
67	Ms.Sutharinee Likitnukul	Lecturer	Ph.D. (Animal Physiology), Chulalongkorn University, Thailand D.V.M. Chulalongkorn University, Thailand	Department of Pharmacology	Likitnukul S, Kalandakanond-Thongsong S, Thammacharoen S. Effects of the short-term of growth hormone administration on plasma leptin in male diet-induced obesity rats. <i>J Physiol Sci.</i> 2018;68(suppl 1):S181.
68	Ms.Jonggonnee Wattanapermpool	Professor	Ph.D. (Physiology and Biophysics), University of Illinois at Chicago, USA M.Sc. (Physiology), Mahidol University, Thailand B.Sc. (Radiological Technology), Mahidol University, Thailand	Department of Physiology	Rattanasopa C, Kirk JA, Bupha-Intr T, Papadaki M, de Tombe PP, Wattanapermpool J . Estrogen but not testosterone preserves myofilament function from doxorubicin-induced cardiotoxicity by reducing oxidative modifications.



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					Am J Physiol Heart Circ Physiol. 2019;316(2):H360-H370.
No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
69	Mr.Narattaphol Charoenphandhu	Professor	Ph.D. (Physiology), Mahidol University, Thailand MD. (Hons.), Mahidol University, Thailand B.Sc. (Medical Science), Mahidol University, Thailand	Department of Physiology	Tithito T, Suntornsaratoon P, Charoenphandhu N , Thongbunchoo J, Krishnamra N, Tang IM, et al. Fabrication of biocomposite scaffolds made with modified hydroxyapatite inclusion of chitosan-grafted-poly(methyl methacrylate) for bone tissue engineering. Biomed Mater. 2019;14(2):025013.
70	Mr.Arthit Chairoungdua	Associate Professor	Ph.D. (Medical Science), Kyorin University School of Medicine, Japan M.Sc. (Toxicology), Mahidol University, Thailand B.N.S. (Nursing Science), Khon Kaen University, Thailand	Department of Physiology	Kitdumrongthum S, Metheetrairut C, Charoensawan V, Ounjai P, Janpipatkul K, Panvongsa W, Weerachayaphorn J, Piyachaturawat P, Chairoungdua A . Dysregulated microRNA expression profiles in cholangiocarcinoma cell-derived exosomes. Life Sci. 2018;210:65-75.
71	Mr.Tepmanas Bupha-Intr	Associate Professor	Ph.D. (Physiology), Mahidol University, Thailand D.V.M. (Veterinary Medicine), Chulalongkorn University, Thailand	Department of Physiology	Jitmana R, Raksapharm S, Kijtaewornrat A, Saengsirisuwan V, Bupha-Intr T . Role of cardiac mast cells in exercise training-mediated cardiac remodeling in angiotensin II-infused ovariectomized rats. Life Sci. 2019;219:209-18.
72	Mr.Sunhapas Soodvilai	Associate Professor	Ph.D. (Physiology), Mahidol University, Thailand B.Pharm. (Pharmacy), Ubon Ratchathani University, Thailand	Department of Physiology	Soodvilai S, Tipparos W, Rangsimawong W, Patrojansophon P, Soodvilai S , Sajomsang W, Opanasopit P. Effects of silymarin-loaded amphiphilic chitosan polymeric micelles on the renal toxicity and anticancer activity of cisplatin. Pharm Dev Technol. 2018;1-27.
73	Mr.Vitoon Saengsirisuwan	Associate Professor	Ph.D. (Physiological Sciences), University of Arizona, USA M.Sc. (Physiology of Exercise), Mahidol University, Thailand B.Sc. (Physical Therapy), Mahidol University, Thailand	Department of Physiology	Jitmana R, Raksapharm S, Kijtaewornrat A, Saengsirisuwan V , Bupha-Intr T. Role of cardiac mast cells in exercise training-mediated cardiac remodeling in angiotensin II-infused ovariectomized rats. Life Sci. 2019;219:209-18.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
74	Ms.Jittima Weerachayaphorn	Assistant Professor	Ph.D. (Cellular Physiology and Molecular Biophysics), University of Texas Medical Branch at Galveston, USA M.Sc. (Physiology), Mahidol University, Thailand B.N.S. (Nursing Science), Mahidol University, Thailand	Department of Physiology	Franca A, Carlos Melo Lima Filho A, Guerra MT, Weerachayaphorn J , Loiola Dos Santos M, Njei B, et al. Effects of endotoxin on type 3 inositol 1,4,5-trisphosphate receptor in human cholangiocytes. Hepatology. 2019;69(2):817-30.
75	Mr.Ratchakrit Srikuea	Assistant Professor	Ph.D. (Exercise Science), Mahidol University, Thailand M.Sc. (Sports Science), Mahidol University, Thailand B.Sc. (Sports Science), Mahidol University, Thailand	Department of Physiology	Srikuea R , Suhatcho K. Impact of intramuscular administration of lipid-soluble and water-soluble vehicles into regenerating muscle at the distinct phases of skeletal muscle regeneration. J Physiol Sci. 2018;68 (5):647-61.
76	Ms.Witchuda Saengsawang	Assistant Professor	Ph.D. (Physiology & Biophysics), University of Illinois at Chicago, USA B.S. (Pharmacy), Mahidol University, Thailand	Department of Physiology	Kwanthongdee J, Sunrat C, Munyoo B, Tuchinda P, Chabang N, Saengsawang W . Phyllanthus taxodiifolius Beille suppresses microtubule dynamics and restricts glioblastoma aggressiveness. Biomed Pharmacother. 2019;112:108645.
77	Mr.Kanit Bhukhai	Lecturer	Ph.D. (Biotherapy and Biotechnology), University of Paris Diderot, France M.Sc. (Physiology), Mahidol University, Thailand B.Sc. (Public Health), Mahidol University, Thailand	Department of Physiology	Bhukhai K , de Dreuzey E, Giorgi M, Colomb C, Negre O, Denaro M, et al. Ex vivo selection of transduced hematopoietic stem cells for gene therapy of β -hemoglobinopathies. Mol Ther. 2018;26(2):480-95.
78	Mr.Ioannis Papadimitriou	Lecturer	Ph.D. (Institute for Health and Sport), Victoria University, Australia M.Sc. (Human Performance and Health), Aristotle University, Greece B.Sc. (Physical Educational and Sports Science), Aristotle University, Greece	Department of Physiology	Papadimitriou ID , Lockey SJ, Voisin S, Herbert AJ, Garton F, Houweling PJ, et al. No association between ACTN3 R577X and ACE I/D polymorphisms and endurance running times in 698 Caucasian athlete. BMC Genomics. 2018;19:13.
79	Mr.Nattapon Panupinthu	Lecturer	Ph.D. (Physiology), The University of Western Ontario, Canada B.Sc. (Biomedical Science), Mahidol University, Thailand	Department of Physiology	Rodrat M, Wongdee K, Panupinthu N , Thongbunchoo J, Teerapornpuntakit J, Krishnamra N, et al. Prolonged exposure to 1,25(OH) ₂ D ₃ and high ionized calcium induces FGF-23 production in intestinal epithelium-like Caco-2 monolayer: A local negative feedback for preventing excessive calcium transport. Arch Biochem Biophys. 2018;640:10-6.



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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
80	Ms.Nittaya Boonmuen	Lecturer	M.Sc. (Physiology), Mahidol University, Thailand B.Sc. (Physical therapy), Chiang Mai University, Thailand	Department of Physiology	Reabroi S, Saeeng R, Boonmuen N , Kasemsuk T, Saengsawang W, Suksen K, et al. The anti-cancer activity of an andrographolide analogue functions through a GSK-3 β -independent Wnt/ β -catenin signaling pathway in colorectal cancer cells. Sci Rep. 2018;8(1):7924.
81	Mr.Stephen M.K. Chan	Lecturer	Ph.D. (Physiology), School of Medical Science, The University of New South Wales, Australia B.Sc. (Medicine Honours), The University of New South Wales, Australia B.Econ. (Achrasia), Macquarie University, Australia	Department of Physiology	Chan SC . Delay no more: struggles to re-imagine Hong Kong (for the next 30 years). Inter-Asia Cultural Studies. 2015;16(3):327-47.

3.2.3 Instructors from other Faculties

- Lecturers from Faculty of Environment and Resource Studies
- Lecturers from Faculty of Liberal Arts
- Lecturers from Institute of Population and Social Research
- Lecturers from Faculty of Social Sciences and Humanities
- Lecturers from other Faculties that join in the courses

3.2.4 Special Instructors

The program invites the special instructors according to their expertise.

4. Components Related to Field Training Experience (Trainings or Multi-Activity Education) (If any)

4.1 Standard of Learning Outcome for Field Training Experience

Not applicable

4.2 Duration

Not applicable

4.3 Schedule and Timetable

Not applicable

4.4 Number of Credits

Not applicable

4.5 Preparation

Not applicable

4.6 Evaluation Procedure

Not applicable



5. Requirements for Project or Research Work (if any)

Students take a Senior Project course (SCBM 499) for 6 credits on year 4. Students will create a well-defined research work in the topic of biomedical science or related fields under the supervision of an advisor.

5.1 Brief Description

Students are introduced to research project in Biomedical Science or related fields under the close guidance of an advisor. Students are expected to independently carry out the learning process, employing their knowledge and technical skills, and implement the scientific process to address the research question of interest.

5.2 Standard of Learning Outcome

5.2.1 Create a research project from literature review and current problems in biomedical science or related fields with standard laboratory safety and professional code of conduct

5.2.2 Carry out laboratory-based experiments to provide information in biomedical science or related fields with international standard methodology

5.2.3 Work as a scientist independently and with other people to complete a research project on a topic of interest

5.2.4 Synthesize knowledge and information acquired from literature review and a complete a research project to produce a senior project report

5.2.5 Communicate concepts of a research project in biomedical science in English clearly and effectively with awareness of plagiarism for scientific research

5.3 Duration

4 years

5.4 Number of Credits

6 (0-12-6)

5.5 Preparation

In the orientation, each student will choose to do a research project from the topics offered by the Faculty of Science Division. They will receive information regarding the protocol to carry out this course, grading and evaluation scheme.

5.5.1 List names of academic staff and research topics during the 2nd semester of 3rd year

5.5.2 Students are divided into groups of 4-5 to discuss possible research topics with advisors.

5.5.3 Advisors give information and recommendation to students as to how to select a research topic, create a research plan, and write a research proposal.

5.5.4 Advisors regularly discuss with students to help them plan experiments, solve problems, and analyze experimental results.

5.5.5 Students prepare the written report for the complete project in both hard copy and electronic file.



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5.6 Evaluation Procedures

Students are expected to submit a research report at the end of the semester. The assessment is composed of performance evaluation (50%) and written report (50%) by the advisor using scoring rubrics.



Section 4 Program-level Learning Outcomes, Teaching Methods, and Evaluation

1. Development of Student Characteristics

Characteristics	Teaching Strategies and Student Activities
Have professional ethics and social responsibilities to serve a role model for co-workers and subordinates	<ul style="list-style-type: none">- Encourage and engage student to think about ethical and professional ethical issues through the use of real-life situations, case studies, site visits, research projects, or lectures from experienced practitioners
Serve as an open-minded leader and entrepreneur with risk-assessment capabilities	<ul style="list-style-type: none">- In class activities that allow students to engage in leader/follower relationship- Research article discussion and problem-based learning that allow students to learn, analyze, and present social and financial utilities of research projects and case studies- Group assignment and presentation that stimulate productive time management and interpersonal interactions
Be able to self-learn, adjust, and adopt novel technologies and research trends with flexibility and creativity	<ul style="list-style-type: none">- Incorporation of audio and visual presentation activities in coursework- Assignment and discussion of research articles that utilize frontier and innovative topics and technologies
Have an empathetic understanding of social problems and an altruistic mind to participate in problem-solving processes	<ul style="list-style-type: none">- As the motto of the University, “Do unto others as you would have others do unto you” has always been the core principle incorporated into curricular and extracurricular activities of Mahidol University’s students.- Site visits to private sectors and discussion with scientists and entrepreneurs- Intensive discussion of ethical and social issues is integrated into scientific and research activities in class



2. Relationship between PLOs and the Professional Standard or National Qualifications Framework for Higher Education / TQF

(Shown in Appendix 3)

3. Program-Level Learning Outcomes, Teaching Strategies, and Evaluation Strategies

Program-Level Learning Outcomes	Teaching Strategies	Evaluation Strategies
PLO1 Synthesize knowledge and information acquired for medical-related problems to protect and improve the health of individuals	1) Interactive Lectures 2) Group discussion 3) Individual and group presentations 4) Case-based and problem-based learning 5) Site visits to private sectors	1) Behavior observation in classrooms and laboratories 2) Multiple-choice and written examinations 3) Evaluation of class participation and group discussion by rubrics 4) Evaluation of the quality of reports and group presentations by rubrics
PLO2 Carry out laboratory-based experiments to provide information about prevention, diagnosis, and treatment of diseases in accordance with international standard methodology	1) Interactive lectures 2) Laboratory practice 3) Group discussion 4) Individual and group presentations 5) Case-based and problem-based learning 6) Work assignment	1) Laboratory performance evaluation using rubrics 2) Practical examination 3) Self-evaluation by formative assessment 4) Rubrics for class participation and group assignments 5) Report evaluation and plagiarism assessment
PLO3 Create an independent project in biomedical science analyzed from scientific journals and laboratory reports along with laboratory safety skills and professional code of conduct to solve medical-related problems	1) Laboratory practice 2) Project-based learning 3) Individual presentation 4) Work assignment 5) Senior project	1) Evaluation of the quality of research projects, including rationale, coherence, data analysis, and conclusion using rubrics 2) Regular progress meeting and evaluation by senior project advisors using rubrics



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Program-Level Learning Outcomes	Teaching Strategies	Evaluation Strategies
PLO4 Communicate concepts of biomedical science clearly and purposefully with target audiences in English, in both written and oral forms with appropriate information technologies in an organized manner.	1) Laboratory meetings and seminars 2) Laboratories and written report assignments 3) Group assignments 4) Poster and oral presentation for research projects 5) Extracurricular activities	1) Behavior observation in classrooms and laboratories 2) Evaluation of class participation and group discussion by rubrics 3) Evaluation of the quality of reports and group presentations by rubrics
PLO5 Work independently and coordinate with others to achieve team goals based on roles and responsibilities of a life science researcher	1) Group discussion 2) Laboratories and report assignments 3) Case-based and problem-based learning 4) Research projects 5) Extracurricular activities	1) Behavior observation in classrooms and laboratories 2) Evaluation of class participation and group discussion by rubrics 3) Evaluation of the quality of reports by rubrics



Section 5 Student Evaluation Criteria

1. Grading Rules/Guidelines

Students receive grades according to the criteria stated in Mahidol University's regulations on undergraduate studies as well as Faculty of Science's regulations and/or announcements.

(1) The symbols and their assigned scores

Grade results of each course may be shown in symbolic type as follows

Symbol	Meaning	Score
A	Excellent	4.00
B+	Very Good	3.50
B	Good	3.00
C+	Fairly Good	2.50
C	Fair	2.00
D+	Poor	1.50
D	Very Poor	1.00
F	Failed	0.00

(2) The symbols without scores

The outcome of the study for each course may be in the forms of certain symbols with the meaning as follows

Symbol	Meaning
AU	Audit
O	Outstanding
S	Satisfactory
T	Transfer of Credit
U	Unsatisfactory
I	Incomplete
P	In Progress
X	No Report
W	Withdrawal

2. Standard Verification Process for Student Achievement

2.1 Analyze students' learning from class participation, group activities, presentation, quizzes, and examinations.

2.2 Consider student evaluation of teachers

2.3 Consider course reports



2.4 Consider feedbacks from stakeholders including students, employers, alumni, and outside experts

3. Graduation Requirements

3.1 Plan A

- 3.1.1 Following Mahidol University Regulations on Diploma and Undergraduate Studies, B.E. 2552 (2009) and the Announcement of the Faculty of Science, Mahidol University on Undergraduate Study, B.E. 2553 (2010)
- 3.1.2 Total time of study should not exceed 8 academic years
- 3.1.3 Students have to complete their credits as stated in the curriculum which includes:
 - General education courses
 - Specific courses
 - Free elective courses
- 3.1.4 Students must have a minimum 2.00 CUM-GPA.
- 3.1.5 Students must pass the criteria set for the English competency prior to their graduation as specified by the program's announcement
 - TOEFL: internet-based ≥ 80 , computer-based ≥ 213
 - IELTS ≥ 6.0
 - equivalent score from other English competency tests which are certified by Mahidol University, such as MU GRAD test ≥ 80
- 3.1.6. Students must demonstrate proper conduct in compliance with the Bachelor of Science degree.

3.2 Plan B

- 3.2.1 Following Mahidol University Regulations on Diploma and Undergraduate Studies, B.E. 2552 (2009) and the Announcement of the Faculty of Science, Mahidol University on Undergraduate Study, B.E. 2553 (2010)
- 3.2.2 Students must have a minimum 2.00 CUM-GPA.
- 3.2.3 Students must demonstrate proper conduct in compliance with the Bachelor of Science degree.
- 3.2.4 Students must pass the criteria for the English competency, i.e. TOEFL or IELTS, declared in the student transfer agreement between the Faculty of Science, Mahidol University and the University of Sussex.
- 3.2.5 Students must pass all the required courses within Year 1 and Year 2 according to the program curriculum and completed all the required courses in Year 3 and Year 4 following the agreement between the Faculty of Science, Mahidol University and the University of Sussex.



3.2.6 Students who cannot complete the study at the University of Sussex may switch to Plan A by transferring the credits earned from the University of Sussex to Mahidol University according to Mahidol University's regulation and approval of the program committee.

4. Students' Appeals

According to Mahidol University Regulations on Disciplinary Measures 2010, the student, who is subject to disciplinary punishment, has the right to appeal to the procedures outlined here. In the case that student wishes to check on the scores, student can contact the instructor directly or submit formal complaint or academic appeal directly to

International Education and Administration Unit, Division of Salaya Campus
Room SC1-116, SC1-Building, Faculty of Science (Salaya Campus), Mahidol University
999 Phuttamonthon 4 Road, A. Phuttamonthon, Nakhon Pathom 73170, Thailand
E-mail: scsim@mahidol.ac.th; Phone: + 66 2 4419820 ext. 1199

If it is considered that a case exists, the matter will be investigated in accordance with the procedures, and the complainant informed of the outcome.



Section 6 Instructor's Professional Development

1. New Instructor Orientation

- 1) New instructors have to attend an orientation that aims to provide objectives and goals of program complying with National Qualifications Framework for Higher Education in Thailand and the Standard of Undergraduate Programs of Study B.E. 2558 announced by the Ministry of Education.
- 2) New instructors will be made aware of teaching and learning strategies, quality assurance, and related regulation or announcement.
- 3) Mentor will be available for new instructors to help and advice as necessary.
- 4) Head of the department and mentor explain responsibilities, related regulations, program curriculum, and teaching processes to new instructors.
- 5) New instructors will be assigned to help coordinate courses and co-advise senior projects of the students to be familiar with the teaching and research processes. New instructors will also partially be responsible for student affairs.

2. Knowledge and Skill Development for Instructor

2.1 Development of Teaching Skills, Assessment, and Evaluation

- 1) Provide workshops to develop skills on teaching and learning methods
- 2) Allow instructors to participate in the evaluation and revision of the curriculum and courses as well as develop a new curriculum

2.2 Other Academic and Professional Development

- 1) Support instructors to do research, produce and present academic projects and continue their studies
- 2) Encourage and support instructors to attend meetings, training sessions, seminars, and studies at other institutes and organizations
- 3) Provide university's promotion standards

2.3 Indicators / Measurements

- 1) Every new instructor (if any) has to participate in the orientation and receive adequate information on teaching and learning requirements.
- 2) Full-time instructors must demonstrate academic and/or profession improvement at least once a year.



Section 7 Quality Assurance

1. Standard Control

The curriculum has employed the Thai Qualification Framework for Higher Education and the Standard of Undergraduate Programs of Study B.E. 2558. The curriculum committee is set up to develop and improve the curriculum every 5 years based on stakeholders' requirement. Stakeholders are identified as academic faculty, current students, alumni, parents, and employers. The curriculum committee also monitors the qualification of instructors.

Indicators/measurements used in the evaluation of this process's efficiency and effectiveness:

- (1) Use the TQF indicator guidelines

2. Graduates

Graduates achieve the learning areas including ethics and moral, knowledge, cognitive skills, interpersonal skills and responsibility, numerical analysis, communication, and information technology skills. The survey is conducted to obtain feedback from employers on their satisfaction of the graduates. All the survey results are used to improve the quality of our teaching and learning.

Indicators/measurements used in the evaluation of this process's efficiency and effectiveness:

- (1) At least 70 percent of new graduates either go on to employment or further study.
- (2) The average graduate users' satisfaction score is more than 3.5 from 5.0.

3. Students

3.1 Student Recruitment and Admission

Recruitment involves activities such as roadshows, open houses, campus visits, and public communication. Student admission criteria will be according to TCAS.

3.2 Academic Consultation and Guidance

Each student is assigned an academic advisor upon entering the program. The advisor's role is to oversee students' academic performance, approve their registration, and guide both the academic and non-academic matter. The program appoints 3-4 instructors as a team of supervisor for each year of student.

3.3 Students' Satisfaction and Management of Students' Appeal

Students have a right to review their exam papers and grades. Moreover, if students are charged and/or punished for cheating, they can appeal within seven days after the time that they received such



a notice. The procedure for filing a complaint is according to Mahidol University's Regulations on Disciplinary Measures 2010.

Indicators/measurements used in the evaluation of this process's efficiency and effectiveness:

- (1) At least 70 percent of students remain in the program.
- (2) The average students' satisfaction score towards the courses' quality is more than 3.5 from 5.0.
- (3) At least 80 percent of final-year students graduate.

4. Instructors

4.1 Recruitment of New Faculty Members

General requirements are made according to Mahidol University and Faculty of Science regulations. New faculty members have to pass a trial period of teaching before being accepted as full-time instructors. New instructors are required to participate in a new staff orientation and a teaching and learning workshop.

4.2 Instructor's Main Responsibility

Program committee and instructors are committed to meet at least once per semester to plan and improve teaching and learning methods according to student and self-evaluations. Faculty members are also encouraged to produce one academic product every three academic years as well as participate in conferences or training that may be beneficial to their profession.

Indicators/measurements used in the evaluation of this process's efficiency and effectiveness:

- (1) Each instructor must produce TQF3 and TQF5 for all assigned courses.
- (2) Every new instructor (if any) has participated in the orientation or received advice on teaching and learning.
- (3) Every full-time instructor has been academically/professionally developed at least once a year.

5. Program, Teaching, and Student Evaluation

The program description stated in TQF2 form complies with the Thai Qualifications Framework for Higher Education. Descriptions of all course work sessions are stated in the TQF3 forms at least before the semesters begin. Students' achievement verification is made as stated in the TQF3 at least 20 percent of the courses in each semester. The teaching and learning approaches for this curriculum follow an outcome-based education (OBE) strategy, based on the AUN-QA criteria. Teaching strategy and student evaluation are developed/improved based on the information in the previous year's TQF7 reported within 60 days after the academic year ends.

Indicators/measurements used in the evaluation of this process's efficiency and effectiveness:

- (1) Use the TQF indicator guidelines



6. Learning Supports

6.1 Budgeting

Mahidol University and the Faculty of Science provide an annual budget for providing a suitable physical environment for studying and purchasing an adequate number of materials in order to support studying both inside and outside the classrooms.

6.2 Available Resources

Students have access to papers, books, journals, teaching media, internet databases from the Mahidol University Library, Salaya Campus and the Faculty of Science Library (Stang Mongkolsuk Library). The Faculty of Science Library, also known as the Stang Mongkolsuk Library, houses a large collection of books and information on science and medical science. It also provides services in inter-library loan and retrieval of articles and databases on science and technology. There are about 35,000 books in chemistry and related fields as well as 1,200 printed journals. The Mahidol University Library, Salaya Campus, houses and collects books and information on science, medical sciences and technology to support teaching, learning, and research of university members, government officials, scientists, researchers and students of the university. The library services include books, journals, research reports, electronic journals, web databases, and also educational technology resources in the form of videotapes, recorded cassette tapes, slides and microfilms. Information technology (IT) facilities, including e-learning, are also available.

6.3 Studying the Sufficiency of the Resources

A survey of instructor and student satisfaction towards services and resources is carried out every semester. This survey is used to improve the number and quality of resources. If the resources are not adequate, the faculty committee will take into consideration and set action plan.

Indicators/measurements used in the evaluation of this process's efficiency and effectiveness:

- (1) The average staffs and students' satisfaction score towards the learning supports is more than 3.5 from 5.0.

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7. Key Performance Indicators

Key Performance Indicators	Academic Years				
	2019	2020	2021	2022	2023
(1) At least 80 percent of the program instructors in charge take part in meetings to plan, monitor, and revise the program's operation.	✓	✓	✓	✓	✓
(2) The program description stated in TQF2 form complies with TQFHE or the program TQF (if any).	✓	✓	✓	✓	✓
(3) Descriptions of all courses work sessions (if any) are stated in the TQF3 forms at least before the semesters begin.	✓	✓	✓	✓	✓
(4) The assessment of all courses and fieldwork sessions (if any) are reported in the TQF5 forms within 30 days after the semester ends.	✓	✓	✓	✓	✓
(5) The program report is made in the TQF7 form within 60 days after the academic year ends.	✓	✓	✓	✓	✓
(6) Students' achievement verification is made as stated in the TQF3 in at least 25 percent of the subjects in each semester.	✓	✓	✓	✓	✓
(7) Teaching strategy and students' evaluation are developed/improved based on the information in the previous year's TQF7.		✓	✓	✓	✓
(8) Every new instructor (if any) has to participate in the orientation and receive adequate information on teaching and learning requirements.	✓	✓	✓	✓	✓
(9) Full-time instructors must demonstrate academic and/or profession improvement at least once a year.	✓	✓	✓	✓	✓
(10) At least 50 percent of the teaching assistants (if any) receive academic or professional development annually.	✓	✓	✓	✓	✓
(11) The average final-year students' satisfaction score or the fresh graduates' satisfaction score towards the program's quality is more than 3.5 from 5.0.				✓	✓
(12) The average graduate users' satisfaction score is more than 3.5 from 5.0.					✓

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Evaluation criteria: A curriculum that meets the standards of the Thailand Qualifications Framework (TQF) must qualify for the following conditions: (1) the compulsory performance indicators (numbers 1-5) must pass beyond expectations and (2) the total number of performance indicators must reach their goals by no less than 80 percent each year.

Additional Indicators from Section 7

Indicators and Goal	Academic Years				
	2019	2020	2021	2022	2023
2. Graduates					
2.1 At least 70 percent of new graduates either go on to employment or further study.					✓
3. Students					
3.1 At least 70 percent of students remain in the program.			✓	✓	✓
3.2 The average students' satisfaction score towards the courses' quality is more than 3.5 from 5.0.		✓	✓	✓	✓
3.3 At least 80 percent of final-year students graduate.				✓	✓
4. Instructors					
4.1 Each instructor must produce TQF3 and TQF5 for all assigned courses.	✓	✓	✓	✓	✓
6. Academic Supports					
6.1 The average staffs and students' satisfaction score towards the learning supports is more than 3.5 from 5.0.	✓	✓	✓	✓	✓



Section 8 Evaluation, Improvement, and Implementation

1. Assessment of Teaching Effectiveness

1.1 Assessment of Teaching Strategy

- 1.1.1 Students' evaluation toward courses and instructors
- 1.1.2 Teaching observation by peer instructors
- 1.1.3 Observation of behavior and responses of the students
- 1.1.4 Regular meeting of the instructors to share information and ask for suggestion
- 1.1.5 Inquiring from students

1.2 Assessment of the Instructor's Skills in Applying Teaching Strategies

- 1.2.1 Analyze from students' evaluation toward courses and instructors
- 1.2.2 Workshop on course improvement with the participation of all instructors in the courses
- 1.2.3 Self-evaluation and peer evaluation

2. Overall Evaluation of the Program

- 2.1 Survey on final-year students' satisfaction towards the program's quality
- 2.2 Survey on employers' satisfaction with graduates
- 2.3 Curriculum evaluation from external expertise
- 2.4 Meeting between student and instructor representatives

3. Assessment of the Program Implementation Based on the Program Specification

Evaluation is made annually by instructors and the curriculum committee according to key performance indicators of section 7, item 7.

- | | | |
|-------------|-------|--|
| "Poor" | means | Program implementation does not meet the first 10 indicators |
| "Good" | means | Program implementation meets the first 10 indicators |
| "Very Good" | means | Program implementation meets all indicators |

Regardless, Mahidol University requires all programs to always keep the program up-to-date, to occasionally demonstrate improvement in educational standard and quality indices at least every 3 years, and to perform program evaluation for program improvement every 5 years.

4. Review of Evaluation Results and Plans for Improvement

Instructors in the program involved in revising, evaluating, and planning to improve and/or develop courses and the curriculum by analyzing results from students' evaluations of instructors; job availability of graduates; level of employers' satisfaction with graduates; and other evaluation results that relate to courses. In general, the curriculum committee has five-year cycle for curriculum change.



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**Appendix shown in the TQF2
 revised program of academic year 2019**

Appendix 1	Mahidol University Degree Profile
Appendix 2	2.1 Program-Level Learning Outcomes (PLOs) and Sub Program-Level Learning Outcomes (SubPLOs) 2.2 Relationship between Program-Level Learning Outcomes and MU Graduate Attributes 2.3 Goals for each Academic Year for Bachelor of Science Program in Biomedical Science
Appendix 3	Table Showing the Comparison of the PLOs and the National TQF Level 2 Corresponding with the Educational Degrees: Level 2 Bachelor' Degree
Appendix 4	Curriculum Mapping (Shown with the Symbols I, R, P, M, A)
Appendix 5	Major Improvements of the Bachelor of Science Program in Biomedical Science (International Program) Issued in Academic Year 2014
Appendix 6	Details of the Instructors Responsible for the Program and Regular Instructors
Appendix 7	Mahidol University Regulations on Diploma and Undergraduate Studies of the Year B.E. 2552 - 2560 and the Affiliation's Educational Announcements/Regulations
Appendix 8	Order of Curriculum Development Committee or Curriculum Screening Procedure Committee or Person In-Charge
Appendix 9	9.1 MOU Made between the University of Sussex and Mahidol University 9.2 Articulation Agreement between the School of Life Science, the University of Sussex and the Faculty of Science, Mahidol University



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Appendix 1

Mahidol University Degree Profile



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Mahidol University Degree Profile

Bachelor's Degree Program	
1. Program Title (In Thai) หลักสูตรวิทยาศาสตรบัณฑิต สาขาวิชาวิทยาศาสตร์ชีวการแพทย์ (หลักสูตรนานาชาติ) (In English) Bachelor of Science Program in Biomedical Science (International Program) 2. Degree Offered (In Thai) วิทยาศาสตรบัณฑิต (วิทยาศาสตร์ชีวการแพทย์) (In English) Bachelor of Science (Biomedical Science)	
General information of the program	
Type of the program	Bachelor's Degree (International Program), Academic Program
Total credits required	Plan A – no less than 132 credits of courses taken while studying at the Faculty of Science, Mahidol University Plan B – no less than 81 credits of courses taken while studying at the Faculty of Science, Mahidol University and no less than 240 credits of courses taken while studying at the University of Sussex
Studying duration / Program cycle	4-Year Program
The program's status and opening schedule	1. Revised Program 2019 2. Program start: Semester 1 Academic Year 2019
Degree granting	One degree of one major
Degree-granting Institutions (MOU with other institutions)	Mahidol University, Thailand
Organizations certifying the standards	-



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Specific information of the program	
Purpose / Goals / Objectives	<p>Goals</p> <p>The program offers a healthcare pathway in preparation for the scientific investigation of how the human body and disease work as well as how to develop prevention and treatment for diseases. The graduates are expected to acquire MU graduate attributes. We also encourage our students to spend time abroad with our partner university, the University of Sussex, United Kingdom, to diversify their knowledge and experience.</p> <p>Objectives</p> <p>To produce graduates who have the characteristics, knowledge and skills as follows:</p> <ol style="list-style-type: none">1. integrate and apply knowledge in biomedical science and related sciences to address health-related needs2. create a research project in biomedical science or related fields using appropriate scientific laboratory skills3. have responsibility for society, problem solving, and creative thinking as well as self-development4. display teamwork, professional ethics, and formulate ideas and products to serve social needs5. have skills in interpersonal communication
Distinctive features	<ol style="list-style-type: none">1. The international bachelor program in biomedical science of Thailand2. Learners have opportunity to choose a study plan abroad through double degree with the University of Sussex.
Educational system	Semester System



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Graduates' advancement	
Career opportunities	<ol style="list-style-type: none">1. Scientist or research assistant in biomedical and diagnostic clinical laboratories2. Product specialist in medical instrument, biotechnology and pharmaceutical companies3. Health communicator and counselor
Further fields of study	<ol style="list-style-type: none">1. Graduate programs in biomedical science and related fields including anatomy and structural biology, biochemistry, microbiology and immunology, pathobiology, pharmacology, physiology, and other programs in life sciences2. Undergraduate program in medicine or allied health programs
Philosophy in program administration	
Educational philosophy	Our primary focus is on educating the learners, as for them to attain academic achievement through learning-centered education, outcome-based education and constructivism. To become a wisdom graduate, learners combine what they have learned so far with the new knowledge, and with experiential learning activities. While the role of a lecturer in the learning process is shift from an information provider to a coach or a facilitator creating challenge-based activities.
Educational philosophy in program management	
Strategy / teaching guidelines	The program is aware of student differences in backgrounds, strengths and weaknesses, interests, and learning styles. Therefore, a range of teaching styles are set through the diverse learning activities according to the learning outcomes including interactive lectures, laboratory practical, individual and group discussions and assignments, active research projects with emphasis on student's demonstration of ideas, logical reasoning, and problem-solving.
Strategy / student's evaluation guidelines	The assessments and evaluations align with the teaching strategies and the desired learning



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	outcomes including formative and summative assessments by using a variety of tools such as written and oral examination, practical test, oral presentation, individual or group class participation and assignment report. Rubrics based on the objectives of the course are announced clearly and used to score the students' achievement.
Competences provided to the students	
Generic competences	<ol style="list-style-type: none"> 1. Ethics: demonstrate moral and ethical behavior and be responsible in their own action including awareness of plagiarism 2. Critical thinking and analysis: be capable of analytical and critical thinking and be able to evaluate both general and scientific information with logical and systematic thinking 3. Creativity: be able to bridge research to innovation which further enhance basic knowledge 4. Communication: be able to choose appropriate forms of English communication such as listening, speaking, reading and writing skills, depending on target audience and for academic purposes 5. Collaboration: be able to work with others appropriately and accept the difference between people 6. ICT: be able to choose the appropriate information technology for searching of information and data and be able to analyze the reliability of data from various sources
Competences provided to the students	
Subject-specific competences	<ol style="list-style-type: none"> 1. Demonstrate conceptual knowledge in biomedical science including anatomy and structural biology, biochemistry, microbiology and immunology, pathology, pharmacology, and physiology 2. Able to apply the knowledge and perform the laboratory skills at molecular, cellular, tissue, and



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	organ levels including bioinformatics, gene technology, cell culture, immunohistochemistry, and microscopy to solve biomedical science-related problems 3. Create a research project in biomedical science including planning, assumption, experimentation, analysis, and conclusion of the finding
Graduates' learning outcomes	
At the end of the program, successful students will be able to:	
PLO1	Synthesize knowledge and information acquired for medical-related problems to protect and improve the health of individuals
PLO2	Carry out laboratory-based experiments to provide information about prevention, diagnosis, and treatment of diseases in accordance with international standard methodology
PLO3	Create an independent project in biomedical science analyzed from scientific journals and laboratory reports along with laboratory safety skills and professional code of conduct to solve medical-related problems
PLO4	Communicate concepts of biomedical science clearly and purposefully with target audiences in English, in both written and oral forms with appropriate information technologies in an organized manner
PLO5	Work independently and coordinate with others to achieve team goals based on roles and responsibilities of a life science researcher



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Appendix 2

2.1 Program-Level Learning Outcomes (PLOs) and Sub Program-Level Learning Outcomes (SubPLOs)



Table in Appendix 2.1

Program-Level Learning Outcomes (PLOs) and Sub Program-Level Learning Outcomes (SubPLOs)

At the end of the program, successful students will be able to:

PLOs	SubPLOs
PLO1 Synthesize knowledge and information acquired for medical-related problems to protect and improve the health of individuals	1.1 Define the concepts in basic science including biology, chemistry, mathematics, and physics for biomedical science study
	1.2 Explain a broad knowledge of human structure, body function, cellular and molecular mechanism, pathogen and host response, pathogenesis, and drug action
	1.3 Apply the fundamental concepts in basic biomedical science for diagnosis, prevention, and treatment of diseases
	1.4 Integrate the knowledge in biomedical science for initiating the research question
PLO2 Carry out laboratory-based experiments to provide information about prevention, diagnosis, and treatment of diseases in accordance with international standard methodology	2.1 Demonstrate laboratory skills in basic sciences and biomedical science-related subjects
	2.2 Demonstrate integrity, honesty, ability to deal with conflicts between own benefits, morality, and ethics
	2.3 Show a good discipline at work, and follow rules and regulations of organizations and societies
	2.4 Distinguish awareness of plagiarism for scientific research and community
PLO3 Create an independent project in biomedical science, analyzed from scientific journals and laboratory reports along with laboratory safety skills and professional code of conduct to solve medical-related problems	3.1 Demonstrate basic research skills at molecular, cellular, tissue, and organ levels including bioinformatics, gene technology, cell culture, immunohistochemistry, and microscopy
	3.2 Initiate a research project from literature review and current problems in biomedical science or related fields with professional code of conduct
	3.3 Carry out scientific research project with international standard laboratory skills including experiment planning, data acquisition, management, and analysis to a selected research problem



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PLOs	SubPLOs
	3.4 Synthesize knowledge and information acquired from literature review and a complete research project in a form of research project report
PLO4 Communicate concepts of biomedical science clearly and purposefully with target audiences in English, in both written and oral forms with appropriate information technologies in an organized manner	4.1 Practice academic writing and speaking skills in English for transferring knowledge and exchanging ideas
	4.2 Present experiment or project results both written and oral forms in English, proper to appropriate audience, such as verbal discussion with peers, and written project reports
	4.3 Perform searching, collecting, and presenting knowledge or research project using information technologies effectively and suitably for the situation
PLO5 Work independently and coordinate with others to achieve team goals based on roles and responsibilities of a life science researcher	5.1 Utilize time and manage workload independently and efficiently to accomplish the team goals
	5.2 Organize the assigned works, duties, and roles in a work group appropriately
	5.3 Adapt themselves and effectively work with other people both as leader and member of the group



2.2 Relations between Program-Level Learning Outcomes and MU Graduate Attributes

Table in Appendix 2.2

Relations between Program-Level Learning Outcomes and MU Graduate Attributes

Program-Level Learning Outcomes / MU Graduate Attributes	PLO1	PLO2	PLO3	PLO4	PLO5
T-shaped Breadth & Depth – Understanding thoroughly both breadth & depth	✓		✓		
Globally Talented – Having talented and experiences to contending against globally	✓	✓	✓	✓	✓
Socially Contributing - Having a public consciousness advantaging to the society		✓	✓	✓	
Entrepreneurially Minded – Decisively thinking, doing, making a decision to accordingly contributing creativity			✓		✓



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2.3 Goals for each Academic Year for Bachelor of Science Program in Biomedical Science

Table in Appendix 2.3

Goals for each Academic Year for Bachelor of Science Program in Biomedical Science

At the End of Year	Goals
1	1) Define the concepts in basic sciences
	2) Adapt themselves and effectively work with other people
2	1) Explain a broad knowledge of human structure, body function, cellular and molecular mechanism, pathogen and host response
	2) Demonstrate ability to communicate effectively in both written and oral English
3	1) Explain a broad knowledge of pathogenesis and drug action
	2) Initiate a research problem related to biomedical science under the supervision
4	1) Apply the concepts in biomedical science to perform a research project
	2) Apply mathematical and statistical knowledge to appropriately analyze, process, solve problems, and present information



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Appendix 3

Table Showing the Comparison between the PLOs and the National TQF Level 2
Corresponding with the Educational Degrees: Level 2 Bachelor' Degree



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Table in Appendix 3

Comparison of the PLOs and the National TQF Level 2 Corresponding with the Educational Degrees: Level 2 Bachelor' Degree

TQF Level 2 / Graduates Competencies / Skills / LOs	PLO1	PLO2	PLO3	PLO4	PLO5
Domain 1 Ethical and Moral Development					
1.1 Have integrity and honesty, and ability to deal with conflicts between own benefits, and morality and ethics	✓	✓	✓	✓	
1.2 Have a good discipline at work, and follow rules and regulations of organizations and societies	✓	✓	✓		✓
1.3 Have a code of conduct and ethical standards		✓	✓	✓	
Domain 2 Knowledge					
2.1 Have knowledge on basic sciences including mathematics, physics, biology, and chemistry	✓				
2.2 Have up-to-date knowledge in the fields of biomedical science	✓		✓		
2.3 Have integrated biomedical science knowledge with other related disciplines	✓	✓	✓		
2.4 Have ability to solve scientific problems and continually gain new knowledge (life-long learning)	✓	✓	✓	✓	
Domain 3 Cognitive Skills					
3.1 Have ability to process and analyze causes of problems and conflicts, and find out preventive measures and proper solutions in both width and depth aspects		✓	✓	✓	
3.2 Be able to apply biomedical science knowledge into real-life training and work experience appropriately in accordance with situations			✓	✓	
3.3 Be able to develop and create scientific project in in biomedical science or related fields			✓		



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TQF Level 2 / Graduates Competencies / Skills / LOs	PLO1	PLO2	PLO3	PLO4	PLO5
Domain 4 Interpersonal Skills and Responsibility					
4.1 Have ability to communicate effectively in English in a professional context	✓	✓	✓	✓	
4.2 Have ability to work and be responsible for assigned works, duties, and roles in a work group	✓	✓	✓		✓
4.3 Be able to adapt themselves and effectively work with other people both as leader and member of the group		✓			✓
Domain 5 Analytical and Communication Skills, Mathematics, and IT Application					
5.1 Be able to apply mathematical and statistical knowledge to appropriately analyze, process, solve problems, and present relevant information		✓	✓	✓	
5.2 Be able to use the English language in listening, speaking, reading, and writing in accordance with audience and situations	✓	✓	✓	✓	
5.3 Be able to apply information technologies on searching, collecting, and presenting data effectively and suitably for the situation	✓	✓	✓	✓	
Domain 6 Psychomotor					
6.1 Be able to perform experimentation in accordance with international standard and proper code of conduct		✓	✓		



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Appendix 4

Curriculum Mapping



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Table in Appendix 4

Curriculum Mapping

Course Codes and Titles		Number of Credits	Program-Level Learning Outcomes (PLOs)				
			PLO1	PLO2	PLO3	PLO4	PLO5
Bachelor of Science Program in Biomedical Science							
Year 1 (Plan A)							
Semester 1							
LAEN 180	English for Academic Purpose I	2 (2-0-4)				I	
PRPR 102	Regional Studies	2 (2-0-4)				I	
SCBM 101	Basic Information Literacy	1 (1-0-2)				I	I
SCBM 102	Learning Techniques	1 (1-0-2)				I	I
SCBE 102	General Biology Laboratory 1	1 (0-3-1)	I	I/P	I/P		
SCBE 121	Essential Biology 1	2 (2-0-4)	I				
SCCH 161	General Chemistry	3 (3-0-6)	I				
SCCH 189	Chemistry Laboratory	1 (0-3-1)	I	I/P	I/P		
SCMA 174	Calculus and Systems of Ordinary Differential Equations	3 (3-0-6)	I				
SCPY 111	Basic Physics Laboratory	1 (0-3-1)	I	I/P	I/P		
SCPY 180	General Physics	3 (3-0-6)	I				
Semester 2							
ENGE 105	Integrating Health and Environment	3 (3-0-6)	I				
LAEN 181	English for Academic Purpose II	2 (2-0-4)				I	
PRPR 101	Population and Development	2 (2-0-4)	I				
SCBM 103	Figurative Language for Everyday Life	1 (1-0-2)	I			I	
SCBM 104	Proper Etiquette for Socialization	2 (2-0-4)	I			I	
SCPS 101	Health and Wellness	2 (2-0-4)	I				
SCBM 121	Cell and Molecular Biology	2 (2-0-4)	I			I	I
SCCH 172	Organic Chemistry	3 (3-0-6)	I				
SCMA 191	Statistics for Medical Sciences	2 (2-0-4)	I			I	
	Elective	2					



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Course Codes and Titles		Number of Credits	Program-Level Learning Outcomes (PLOs)				
			PLO1	PLO2	PLO3	PLO4	PLO5
Bachelor of Science Program in Biomedical Science							
Year 2 (Plan A)							
Semester 1							
LAEN 380	Academic Presentations in English	2 (2-0-4)				I	
SCBC 207	Science in Social Media	2 (2-0-4)	I			I	
SCPA 203	Young Blood Detective	2 (2-0-4)	I			I	
SCPM 203	General Principles of Drug and Herbal Usage	2 (2-0-4)	I				
SCBM 211	Human Structure 1	3 (1-4-4)	R	R/P			R
SCBM 224	Biochemistry	3 (3-0-6)	R			R	R
SCBM 225	Laboratory in Biochemistry	1 (0-2-1)	R	R/P	R/P	R	R
SCBM 261	Physiology for Medical Sciences 1	2 (2-0-4)	R				
	Elective	2					
Semester 2							
LAEN 282	Multilingualism and Multiculturalism	2 (2-0-4)				I	
SCPA 204	Common Diseases in Various Age Groups	2 (2-0-4)	I				
SCBM 212	Human Structure 2	3 (1-4-4)	R	R/P			R
SCBM 214	Structures of Cell and Tissue	3 (2-2-5)	R	R/P	R/P		R
SCBM 233	Laboratory in Microbiology and Immunology	1 (0-2-1)	R	R/P	R/P		R
SCBM 234	Fundamental Immunology	1 (1-0-2)	R				R
SCBM 235	Fundamental Microbiology	2 (2-0-4)	R			R	R
SCBM 262	Physiology for Medical Sciences 2	2 (2-0-4)	R			R	
SCBM 263	Physiology for Medical Sciences 3	3 (3-0-6)	R			R	
	Elective	2					



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			PLO1	PLO2	PLO3	PLO4	PLO5	
Bachelor of Science Program in Biomedical Science								Year 3 (Plan A)
Semester 1								
SCBM 321	Medical Genetics	2 (2-0-4)	R					
SCBM 340	Basic Cellular Pathology	2 (2-0-4)	R					
SCBM 341	General Pathology	2 (1-2-3)	R	R/P	R/P		R	
SCBM 347	Systemic Pathology	3 (2-2-5)	R	R/P	R/P	R	R	
SCBM 351	Principal Actions of Therapeutic Agents	1 (1-0-2)	R			R		
SCBM 352	Pharmacology 1	2 (2-0-4)	R			R		
SCBM 353	Pharmacology 2	2 (2-0-4)	R			R		
SCBM 371	Generic Skills in Science Research	1 (1-0-2)	R			R		
SCBM 372	Laboratory Exploration	1 (1-0-2)	R			R		
Semester 2								
SCBM 312	Medical Neuroscience	3 (1-4-4)	R	R/P				
SCBM 373	Bioinformatics	2 (2-0-4)	R			R		
SCBM 374	Gene Technology	1 (0-2-1)	R		R/P	R	R	
SCBM 375	Microscopy and Bioimaging	2 (1-2-3)	R		R/P	R	R	
SCBM 376	Cell Culture Techniques	2 (1-2-3)	R		R/P	R	R	
SCBM 377	Use of Experimental Animals for Scientific Research	1 (1-0-2)	R			R		
Module A: Neuroscience								
SCAN 311	Cellular and Molecular Neuroscience	3 (3-0-6)	R			R		
SCAN 312	Techniques in Neuroscience Research	3 (2-2-5)			R/P	R		
Module B: Cell and Molecular Medicine								
SCBC 321	Molecular Aspects of Human Diseases	3 (3-0-6)	R			R		
SCBC 322	Laboratory Rotation in Cell and Molecular Medicine	3 (1-4-4)			R/P	R	R	
Module C: Medical Microbiology								
SCMI 331	Medical Bacteriology	2 (1-2-3)	R		R/P	R	R	
SCMI 332	Medical Mycology and Parasitology	2 (1-2-3)	R		R/P	R	R	
SCMI 333	Medical Virology	2 (1-2-3)	R		R/P	R	R	
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			PLO1	PLO2	PLO3	PLO4	PLO5
Bachelor of Science Program in Biomedical Science			Year 3 (Plan A)				
Semester 2 (cont.)							
Module D: Novel Therapeutic Strategies and Diagnosis							
SCPA 341	Cancer Biology and Novel Biomarkers	2 (2-0-4)	R			R	
SCPA 342	Biological Aging and Regenerative Medicine	2 (2-0-4)	R			R	
SCPA 343	Discovery of Potential Therapy in Non-Communicable Diseases	2 (2-0-4)	R			R	
Module E: Frontiers in Drug Discovery and Therapeutic Perspectives							
SCPM 351	Clinical Pharmacology	2 (2-0-4)	R			R	
SCPM 352	Seminar in Pharmacology	2 (2-0-4)	R			R	R
SCPM 353	Precision Medicine	2 (2-0-4)	R			R	R
Module F: Translational Physiology							
SCPS 361	Physiology of Aging	2 (2-0-4)	R			R	
SCPS 362	Exercise Physiology	2 (1-2-3)	R	R/P			R
SCPS 363	Seminar in Translational Physiology	2 (2-0-4)	R			R	



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			PLO1	PLO2	PLO3	PLO4	PLO5	
Bachelor of Science Program in Biomedical Science								Year 4 (Plan A)
Semester 1								
SCBM 490	Scientific Research Planning	4 (0-8-4)	R		R/P	R		
SCBM 491	Seminar in Biomedical Science 1	1 (1-0-2)	R			R	R	
Module A: Neuroscience								
SCAN 411	Neurodegeneration and Neuroregeneration	2 (2-0-4)	R			R		
SCAN 412	Innovation in Clinical Neuroscience	2 (2-0-4)	R			R		
Module B: Cell and Molecular Medicine								
SCBC 421	Frontiers in Molecular Bioscience	2 (2-0-4)	R			R		
SCBC 422	Innovation in Translational Biomedicine	2 (2-0-4)	R			R	R	
Module C: Medical Microbiology								
SCMI 431	Human Immune System in Health and Diseases	1 (1-0-2)	R				R	
SCMI 432	Current Research in Infectious Diseases	1 (1-0-2)	R			R	R	
SCPA 441	Diagnosis and Control of Infectious Diseases	2 (2-0-4)	R				R	
Module D: Novel Therapeutic Strategies and Diagnosis								
SCPA 441	Diagnosis and Control of Infectious Diseases	2 (2-0-4)	R				R	
SCPA 442	Novel Research on Therapeutic Strategies and Diagnosis	2 (0-4-2)	R		R/P	R	R	
Module E: Frontiers in Drug Discovery and Therapeutic Perspectives								
SCPM 451	Cosmetics and Nutraceuticals	2 (1-2-3)	R		R/P	R	R	
SCPM 452	Animal Models for Drug Testing	2 (2-0-4)	R			R	R	
Module F: Translational Physiology								
SCPS 461	Brain, Mind and Behavior	2 (2-0-4)	R					
SCPS 462	Trends in Translational Physiology	2 (1-2-3)	R		R/P		R	
Semester 2								
SCBM 492	Seminar in Biomedical Science 2	1 (1-0-2)	M			M	M	
SCBM 496	Scientific Writing	2 (2-0-4)	M			M	M	
SCBM 499	Senior Project	6 (0-12-6)	M/A	M/A	M/A	M/A	M/A	



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			PLO1	PLO2	PLO3	PLO4	PLO5
Bachelor of Science Program in Biomedical Science			Year 1 (Plan B)				
Semester 1							
LAEN 180	English for Academic Purpose I	2 (2-0-4)				I	
PRPR 102	Regional Studies	2 (2-0-4)				I	
SCBM 101	Basic Information Literacy	1 (1-0-2)				I	I
SCBM 102	Learning Techniques	1 (1-0-2)				I	I
SCBE 102	General Biology Laboratory 1	1 (0-3-1)	I	I/P	I/P		
SCBE 121	Essential Biology 1	2 (2-0-4)	I				
SCCH 161	General Chemistry	3 (3-0-6)	I				
SCCH 189	Chemistry Laboratory	1 (0-3-1)	I	I/P	I/P		
SCMA 174	Calculus and Systems of Ordinary Differential Equations	3 (3-0-6)	I				
SCPY 111	Basic Physics Laboratory	1 (0-3-1)	I	I/P	I/P		
SCPY 180	General Physics	3 (3-0-6)	I				
Semester 2							
ENGE 105	Integrating Health and Environment	3 (3-0-6)	I				
LAEN 181	English for Academic Purpose II	2 (2-0-4)				I	
PRPR 101	Population and Development	2 (2-0-4)	I				
SCBM 103	Figurative Language for Everyday Life	1 (1-0-2)	I			I	
SCBM 104	Proper Etiquette for Socialization	2 (2-0-4)	I			I	
SCPS 101	Health and Wellness	2 (2-0-4)	I				
SCBM 121	Cell and Molecular Biology	2 (2-0-4)	I			I	I
SCCH 172	Organic Chemistry	3 (3-0-6)	I				
SCMA 191	Statistics for Medical Sciences	2 (2-0-4)	I			I	
	Elective	2					



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			PLO1	PLO2	PLO3	PLO4	PLO5
Bachelor of Science Program in Biomedical Science							
Year 2 (Plan B)							
Semester 1							
LAEN 380	Academic Presentations in English	2 (2-0-4)				I	
SCBC 207	Science in Social Media	2 (2-0-4)	I			I	
SCPA 203	Young Blood Detective	2 (2-0-4)	I			I	
SCPM 203	General Principles of Drug and Herbal Usage	2 (2-0-4)	I				
SCBM 211	Human Structure 1	3 (1-4-4)	R	R/P			R
SCBM 224	Biochemistry	3 (3-0-6)	R			R	R
SCBM 225	Laboratory in Biochemistry	1 (0-2-1)	R	R/P	R/P	R	R
SCBM 261	Physiology for Medical Sciences 1	2 (2-0-4)	R				
	Elective	2					
Semester 2							
LAEN 282	Multilingualism and Multiculturalism	2 (2-0-4)				I	
SCPA 204	Common Diseases in Various Age Groups	2 (2-0-4)	I				
SCBM 212	Human Structure 2	3 (1-4-4)	R	R/P			R
SCBM 214	Structures of Cell and Tissue	3 (2-2-5)	R	R/P	R/P		R
SCBM 233	Laboratory in Microbiology and Immunology	1 (0-2-1)	R	R/P	R/P		R
SCBM 234	Fundamental Immunology	1 (1-0-2)	R				R
SCBM 235	Fundamental Microbiology	2 (2-0-4)	R			R	R
SCBM 262	Physiology for Medical Sciences 2	2 (2-0-4)	R			R	
SCBM 263	Physiology for Medical Sciences 3	3 (3-0-6)	R			R	
	Elective	2					



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			PLO1	PLO2	PLO3	PLO4	PLO5
Bachelor of Science Program in Biomedical Science			Year 3 (Plan B)				
Autumn							
C7108	Cell Regulation and Cancer	15	R				R
C7110	Genetics and Genomics	15	R	R/P		R	R
C7114	Structural Basis of Biological Function	15	R	R/P		R	R
C7138	Haematology and Anatomy	15	R	R/P		R	R
Spring							
C7020	Clinical Biochemistry	15	R	R/P		R	R
C7102	Virology	15	R	R/P		R	R
C7137	Medical Microbiology	15	R	R/P		R	R
C7140	Combating Disease	15	R	R/P		R	R



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			PLO1	PLO2	PLO3	PLO4	PLO5	
Bachelor of Science Program in Biomedical Science								Year 4 (Plan B)
Autumn								
C1120	Neuronal Transduction and Transmission	15	R					
C7118	Cell Signalling and its Application in Therapeutics and Disease	15	R				R	
C7121	Immunology in Health and Disease	15	R	R/P			R	R
C7123	Molecular Genetics	15	R					
C7132	Regulating the Transcriptome	15	R				R	
C7162	Life Sciences Year 3 Research Project (Literature)	30	R	R/P	R/P		R	R
C7127*	Life Sciences Year 3 Research Project (Experimental)	30	M/A	M/A	M/A		M/A	M/A
Spring								
861C1	Advanced Haematology and Transfusion Science	15	R	R/P			R	R
C1121	Neuronal Plasticity and Gene Regulation	15	R					
C7117	Innovation in Bioscience and Medicine	15	R				R	
C7120	Genomics and Bioinformatics	15	R	R/P			R	
C7124	Protein Form and Function	15	R					
C7128	Molecular Pharmacology	15	R				R	
C7129	Genome Stability, Genetics Diseases and Cancer	15	R				R	
C7131	Post Transcriptional Control of Gene Expression	15	R				R	
C7143	Structure and Function in the Brain	15	R	R/P			R	
C7163	Advanced Human Virology and Bacteriology	15	R				R	

* The course is provided by the University of Sussex and it is the final year of study. The student will be carried out a research project throughout the year.

I : PLO is Introduced and Assessed R : PLO is Reinforced and Assessed
 P : PLO is Practiced and Assessed M : Level of Mastery is Assessed
 A : Assessment



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Appendix 5

Major Improvements of the Bachelor of Science Program in Biomedical Science
(International Program) Issued in Academic Year 2014



Program under Revision Bachelor of Science
Program in Biomedical Science (International Program) Academic Year 2014
Faculty of Science, Mahidol University

1. This program has been approved by the Office of the Higher Education Commission on July 7, 2015.
2. The Mahidol University Council has approved this revision in its meeting no. 484 on May 21, 2014.
3. The revised program is to be implemented starting in the academic year of 2019 from semester 1 of the year 2019 onwards.
4. **Reasons for the revision**
 - 4.1 To comply with the Standard of Undergraduate Programs of Study announced by the Ministry of Education 2015
 - 4.2 To meet Mahidol University policy to educate the learners, as for them to attain academic achievement through learning-centered education, outcome-based education and constructivism
 - 4.3 To modify the program to ensure that our graduates have the MU Graduate Attributes
 - 4.4 To meet the requirements of each AUN-QA criterion
 - 4.5 To modify the study plan from a tight period of 3.5 years to a regular period of 4 years
 - 4.6 To raise the teaching and learning to a higher standard meeting the advancing knowledge and technology, meeting the requirement of students and employers
 - 4.7 To modify the courses in accordance with the outcome-based education and to produce graduates with 21st century skills and discipline-specific knowledge and skills through varieties of the teaching-learning approaches
5. **Content of the revision**
 - 5.1 Program title and degree offered
 - No change
 - 5.2 Rearranged the study plan
 - Changed from 3.5-year to 4-year program
 - 5.3 Added new course category entitled “Health and Recreation” in General Education Courses
 - 5.4 Added, cancelled, and moved courses in the group of “General Education”
“Social Sciences and Humanities” category
 - added SCBM 104 Proper Etiquette for Socialization 2 (2-0-4)
 - “Language” category
 - added LAEN 282 Multilingualism and Multiculturalism 2 (2-0-4)
 - added SCBM 103 Figurative Language for Everyday Life 1 (1-0-2)



- cancelled LAEN 280 Science Fiction and Society 2 (2-0-4)

“Science and Mathematics” category

- added SCBC 201 Science in Social Media 2 (2-0-4)
- added SCBM 101 Basic Information Literacy 1 (1-0-2)
- added SCBM 102 Learning Techniques 1 (1-0-2)
- added SCPA 203 Young Blood Detective 2 (2-0-4)
- cancelled SCBI 163 Essential Biology 2 (2-0-4)
- moved SCCH 161 General Chemistry 3 (3-0-6) to “Specific Course”
- moved SCCH 172 Organic Chemistry 3 (3-0-6) to “Specific Course”
- cancelled SCMA 161 Technology in Daily Life 3 (3-0-6)
- cancelled SCPY 163 Basic Physics for Medical Science 2 (2-0-4)
- cancelled SCID 201 Learning Techniques 1 (1-0-2)
- cancelled SCID 202 Basic Information Literacy 1 (1-0-2)

“Health and Recreation” category

- added SCPA 204 Common Diseases in Various Age Groups 2 (2-0-4)
- added SCPM203 General Principles of Drug and Herbal Usage 2 (2-0-4)
- added SCPS101 Health and Wellness 2 (2-0-4)

5.5 Added, cancelled, and regrouped the courses in specific courses

“Core Courses” changed from 15 credits to 19 credits

- added SCBE 102 General Biology Laboratory 1 1 (0-3-1)
- added SCBE 121 Essential Biology 1 2 (2-0-4)
- moved SCCH 161 General Chemistry 3 (3-0-6) from general education course to core course
- moved SCCH 172 Organic Chemistry 3 (3-0-6) from general education course to core course
- added SCMA 191 Statistics for Medical Sciences 2 (2-0-4)
- added SCPY 111 Basic Physics Laboratory 1 (0-3-1)
- added SCPY 180 General Physics 3 (3-0-6)
- cancelled SCBI 192 Biology Laboratory 1 (0-3-1)
- cancelled SCID 102 Cell and Molecular Biology 3 (3-0-6)
- cancelled SCMA 192 Statistics 3 (3-0-6)
- cancelled SCPY 160 General Physics Laboratory 1 (0-3-1)
- cancelled SCPY 164 Physics for Medical Science 3 (3-0-6)

“Major Required Courses”

- added SCBM 121 Cell and Molecular Biology 2 (2-0-4)
- added SCBM 223 Laboratory in Microbiology and Immunology 1 (0-2-1)
- added SCBM 224 Fundamental Immunology 1 (1-0-2)
- added SCBM 225 Fundamental Microbiology 2 (2-0-4)



- added SCBM 340 Basic Cellular Pathology 2 (2-0-4)
- added SCBM 371 Generic Skills in Science Research 1 (1-0-2)
- added SCBM 372 Laboratory Exploration 1 (1-0-2)
- added SCBM 373 Bioinformatics 2 (2-0-4)
- added SCBM 374 Gene Technology 1 (0-2-1)
- added SCBM 375 Microscopy and Bioimaging 2 (1-2-3)
- added SCBM 376 Cell Culture Techniques 2 (1-2-3)
- added SCBM 377 Use of Experimental Animals for Scientific Research 1 (1-0-2)
- added SCBM 490 Scientific Research Planning 4 (0-8-4)
- added SCBM 491 Seminar in Biomedical Science 1 1 (1-0-2)
- added SCBM 492 Seminar in Biomedical Science 2 1 (1-0-2)
- changed code and credit from SCBM 221 Physiology for Medical Sciences 1 3 (3-0-6) to SCBM 261 Physiology for Medical Sciences 1 2 (2-0-4)
- changed code and credit from SCBM 222 Physiology for Medical Sciences 2 3 (3-0-6) to SCBM 262 Physiology for Medical Sciences 2 2 (2-0-4)
- changed code from SCBM 223 Physiology for Medical Sciences 3 3 (3-0-6) to SCBM 263 Physiology for Medical Sciences 3 3 (3-0-6)
- changed code and credits from SCBM 215 Medical Neuroscience 4 (3-2-7) to SCBM 312 Medical Neuroscience 3 (2-2-5)
- changed code from SCBM 381 Medical Genetics 2 (2-0-4) to SCBM 321 Medical Genetics 2 (2-0-4)
- changed code and credits from SCBM 342 Systemic Pathology 4 (2-4-6) to SCBM 347 Systemic Pathology 3 (2-2-5)
- changed code and credits from SCBM 451 Principal Actions of Therapeutuc Agents 2 (2-0-4) to SCBM 351 Principal Actions of Therapeutic Agents 1 (1-0-2)
- changed code and credits from SCBM 452 Pharmacology 1 3 (3-0-6) to SCBM 352 Pharmacology 1 2 (2-0-4)
- changed code and credits from SCBM 453 Pharmacology 2 3 (3-0-6) to SCBM 353 Pharmacology 2 2 (2-0-4)
- changed code from SCBM 497 Scientific Writing 2 (2-0-4) to SCBM 496 Scientific Writing 2 (2-0-4)
- cancelled SCID 301 System Ecology and Disease Emergence 3 (3-0-6)
- cancelled SCID 302 Gene Technology 1 (0-2-1)
- cancelled SCBM 213 Human Embryology 2 (2-0-4)
- cancelled SCBM 231 Fundamental Immunology 1 (1-0-2)
- cancelled SCBM 232 Fundamental Microbiology 2 (2-0-4)
- cancelled SCBM 251 Cell and Molecular Medicine 3 (3-0-6)
- cancelled SCBM 343 Clinical Pathology 2 (1-2-3)
- cancelled SCBM 498 Seminar in Biomedical Science 1 (1-0-2)



5.6 Revised and created the “Major Elective Courses” called modules

“Major Elective Courses” modified from 3 modules to 6 modules

Module A: Neuroscience

- added SCAN 311 Cellular and Molecular Neuroscience 3 (3-0-6)
- added SCAN 312 Techniques in Neuroscience Research 3 (2-2-5)
- added SCAN 411 Neurodegeneration and Neuroregeneration 2 (2-0-4)
- added SCAN 412 Innovation in Clinical Neuroscience 2 (2-0-4)

Module B: Cell and Molecular Medicine

- added SCBC 321 Molecular Aspects of Human Diseases 3 (3-0-6)
- added SCBC 322 Laboratory Rotation in Cell and Molecular Medicine 3 (1-4-4)
- added SCBC 421 Frontiers in Molecular Bioscience 2 (2-0-4)
- added SCBC 422 Innovation and Translational Biomedicine 2 (2-0-4)

Module C: Medical Microbiology

- changed code from SCBM 331 Medical Bacteriology 2 (1-2-3) to SCMI 331 Medical Bacteriology 2 (1-2-3)
- changed code from SCBM 332 Medical Mycology and Parasitology 2 (1-2-3) to SCMI 332 Medical Mycology and Parasitology 2 (1-2-3)
- changed code from SCBM 333 Medical Virology 2 (1-2-3) to SCMI 333 Medical Virology 2 (1-2-3)
- changed code and credits from SCBM 334 Human Immune Response 2 (1-2-3) to SCMI 431 Human Immune System in Health and Diseases 1 (1-0-2)
- added SCMI 432 Current Research in Infectious Diseases 1 (1-0-2)

Module D: Novel Therapeutic Strategies and Diagnosis

- added SCPA 341 Cancer Biology and Novel Biomarkers 2 (2-0-4)
- added SCPA 342 Biological Aging and Regenerative Medicine 2 (2-0-4)
- added SCPA 343 Discovery of Potential Therapy in Non-communicable Diseases 2 (2-0-4)
- added SCPA 441 Diagnosis and Control of Infectious Diseases 2 (2-0-4)
- added SCPA 442 Novel Research on Therapeutic Strategies and Diagnosis 2 (0-4-2)

Module E: Frontiers in Drug Discovery and Therapeutic Perspectives

- added SCPM 351 Clinical Pharmacology 2 (2-0-4)
- added SCPM 352 Seminar in Pharmacology 2 (2-0-4)
- added SCPM 353 Precision Medicine 2 (2-0-4)
- added SCPM 451 Cosmetics and Nutraceuticals 2 (1-2-3)
- added SCPM 452 Animal Models for Drug Testing 2 (2-0-4)

Module F: Translational Physiology

- added SCPS 361 Physiology of Aging 2 (2-0-4)
- added SCPS 362 Exercise Physiology 2 (1-2-3)
- added SCPS 363 Seminar in Translational Physiology 2 (2-0-4)



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- added SCPS 461 Brain, Mind and Behavior 2 (2-0-4)
- added SCPS 462 Trends in Translational Physiology 2 (2-0-4)
- cancelled SCID 306 Animal Cell Culture Techniques 2 (1-2-3)
- cancelled SCID 307 Separation Techniques 2 (1-2-3)
- cancelled SCID 308 Application of Microscopy 2 (1-2-3)
- cancelled SCBM 301 Tissue Regenerative Medicine 1 (1-0-2)
- cancelled SCBM 302 Regenerative Neurobiology 2 (2-0-4)
- cancelled SCBM 303 Aging of Central Nervous System 2 (2-0-4)
- cancelled SCBM 304 Biological Science of Aging 2 (2-0-4)
- cancelled SCBM 311 Animal Models for Diseases 1 (1-0-2)
- cancelled SCBM 344 Cellular and Molecular Pathology 2 (2-0-4)
- cancelled SCBM 345 Cancer Biology 1 (1-0-2)
- cancelled SCBM 346 Tropical Infectious Diseases and Controls 2 (2-0-4)

5.7 Added and cancelled elective courses from changing of minimal requirement for elective courses from 8 credits to 6 credits

- added suggested elective course SCBM 201 Science of Happiness 1 (1-0-2)
- added suggested elective course SCBM 202 Strictly Come Ballroom Dancing 1 (0-2-1)
- cancelled suggested elective course SCID 203 Laboratory Exploration 1 (1-0-2)
- cancelled suggested elective course SCID 303 Bioinformatics 2 (2-0-4)
- cancelled suggested elective course SCID 304 Animal Experimentation 1 (0-2-1)
- cancelled suggested elective course SCID 305 Generic Skills in Science Research 1 (1-0-2)



Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Current program			Revised program			Remark
General Education (30 credits)			General Education (30 credits)			
Social Sciences and Humanities			Social Sciences and Humanities			
PRPR 101 วปส ๑๐๑	Population and Development ประชากรและการพัฒนา	2 (2-0-4)	PRPR 101 วปส ๑๐๑	Population and Development ประชากรและการพัฒนา	2 (2-0-4)	no change
PRPR 102 วปส ๑๐๒	Regional Studies ภูมิภาคศึกษา	2 (2-0-4)	PRPR 102 วปส ๑๐๒	Regional Studies ภูมิภาคศึกษา	2 (2-0-4)	no change
-			SCBM 104 วทพ ๑๐๔	Proper Etiquette for Socialization มารยาทเพื่อการเข้าสังคม	2 (2-0-4)	new course
Language			Language			
LAEN 180 ศศภ ๑๘๐	English for Academic Purpose I ภาษาอังกฤษเพื่อวัตถุประสงค์ทางการศึกษา ๑	2 (2-0-4)	LAEN 180 ศศภ ๑๘๐	English for Academic Purpose I ภาษาอังกฤษเพื่อวัตถุประสงค์ทางการศึกษา ๑	2 (2-0-4)	no change
LAEN 181 ศศภ ๑๘๑	English for Academic Purpose II ภาษาอังกฤษเพื่อวัตถุประสงค์ทางการศึกษา ๒	2 (2-0-4)	LAEN 181 ศศภ ๑๘๑	English for Academic Purpose II ภาษาอังกฤษเพื่อวัตถุประสงค์ทางการศึกษา ๒	2 (2-0-4)	no change
-			LAEN 282 ศศภ ๒๘๒	Multilingualism and Multiculturalism พหุภาษาและพหุวัฒนธรรม	2 (2-0-4)	new course
LAEN 380 ศศภ ๓๘๐	Academic Presentations in English การนำเสนอผลงานเป็นภาษาอังกฤษ	2 (2-0-4)	LAEN 380 ศศภ ๓๘๐	Academic Presentations in English การนำเสนอผลงานเป็นภาษาอังกฤษ	2 (2-0-4)	no change
-			SCBM 103 วทพ ๑๐๓	Figurative Language for Everyday Life โวหารภาพพจน์สำหรับชีวิตประจำวัน	1 (1-0-2)	new course
LAEN 280 ศศภ ๒๘๐	Science Fiction and Society วรรณกรรมวิทยาศาสตร์กับสังคม	2 (2-0-4)	-			cancel
Science and Mathematics			Science and Mathematics			
ENGE 105 สวศ ๑๐๕	Integrating Health and Environment บูรณาการสุขภาพและสิ่งแวดล้อม	3 (3-0-6)	ENGE 105 สวศ ๑๐๕	Integrating Health and Environment บูรณาการสุขภาพและสิ่งแวดล้อม	3 (3-0-6)	no change
-			SCBC 201 วทช ๒๐๑	Science in Social Media วิทยาศาสตร์ในสื่อสังคม	2 (2-0-4)	new course
-			SCBM 101 วทพ ๑๐๑	Basic Information Literacy การเรียนรู้สารสนเทศพื้นฐาน	1 (1-0-2)	new course
-			SCBM 102 วทพ ๑๐๒	Learning Techniques เทคนิคการเรียนรู้	1 (1-0-2)	new course
-			SCPA 203 วทพ ๒๐๓	Young Blood Detective ยอดนักสืบสายเลือดใหม่	2 (2-0-4)	new course
SCBI 163 วทช ๑๖๓	Essential Biology ชีววิทยาสาระสำคัญ	2 (2-0-4)	-			cancel
SCCH 161 วทค ๑๖๑	General Chemistry เคมีทั่วไป	3 (3-0-6)	-			move to core course
SCCH 172 วทค ๑๗๒	Organic Chemistry เคมีอินทรีย์	3 (3-0-6)	-			move to core course
SCID 201 วทค ๒๐๑	Learning Techniques เทคนิคการเรียนรู้	1 (1-0-2)	-			cancel
SCID 202 วทค ๒๐๒	Basic Information Literacy การเรียนรู้สารสนเทศพื้นฐาน	1 (1-0-2)	-			cancel
SCMA 161 วทค ๑๖๑	Technology in Daily Life เทคโนโลยีในชีวิตประจำวัน	3 (3-0-6)	-			cancel
SCPY 163 วทฟ ๑๖๓	Basic Physics for Medical Science ฟิสิกส์พื้นฐานสำหรับวิทยาศาสตร์การแพทย์	2 (2-0-4)	-			cancel



Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Current program			Revised program			Remark
Health and Recreation			Health and Recreation			
-			SCPA 204 วทพร ๒๐๔	Common Diseases in Various Age Groups โรคทั่วไปในกลุ่มวัยต่าง ๆ	2 (2-0-4)	new course
-			SCPM 203 วทภส ๒๐๓	General Principles of Drug and Herbal Usage หลักการทั่วไปของการใช้ยาและสมุนไพร	2 (2-0-4)	new course
-			SCPS 101 วทสร ๑๐๑	Health and Wellness สุขภาพเพื่อการพัฒนาคุณภาพชีวิต	2 (2-0-4)	new course
Specific courses (97 credits)			Specific courses (96 credits)			
Core courses (15 credits)			Core courses (19 credits)			
-			SCBE 102 วททส ๑๐๒	General Biology Laboratory 1 ปฏิบัติการชีววิทยาทั่วไป ๑	1 (0-3-1)	new course
-			SCBE 121 วททส ๑๒๑	Essential Biology 1 สาระสำคัญทางชีววิทยา	2 (2-0-4)	new course
-			SCCH 161 วทคณ ๑๖๑	General Chemistry เคมีทั่วไป	3 (3-0-6)	move from general education
-			SCCH 172 วทคณ ๑๗๒	Organic Chemistry เคมีอินทรีย์	3 (3-0-6)	move from general education
SCCH 189 วทคณ ๑๘๙	Chemistry Laboratory ปฏิบัติการเคมี	1 (0-3-1)	SCCH 189 วทคณ ๑๘๙	Chemistry Laboratory ปฏิบัติการเคมี	1 (0-3-1)	no change
SCMA 174 วทคณ ๑๗๔	Calculus and Systems of Ordinary Differential Equations แคลคูลัสและระบบสมการเชิงอนุพันธ์สามัญ	3 (3-0-6)	SCMA 174 วทคณ ๑๗๔	Calculus and Systems of Ordinary Differential Equations แคลคูลัสและระบบสมการเชิงอนุพันธ์สามัญ	3 (3-0-6)	no change
-			SCMA 191 วทคณ ๑๙๑	Statistics for Medical Sciences สถิติศาสตร์สำหรับวิทยาศาสตร์การแพทย์	2 (2-0-4)	new course
-			SCPY 111 วทฟส ๑๑๑	Basic Physics Laboratory ปฏิบัติการฟิสิกส์ขั้นพื้นฐาน	1 (0-3-1)	new course
-			SCPY 180 วทฟส ๑๘๐	General Physics ฟิสิกส์ทั่วไป	3 (3-0-6)	new course
SCBI 192 วทชว ๑๙๒	Biology Laboratory ปฏิบัติการชีววิทยา	1 (0-3-1)	-			cancel
SCID 102 วทคร ๑๐๒	Cell and Molecular Biology ชีววิทยาระดับเซลล์และโมเลกุล	3 (3-0-6)	-			cancel
SCMA 192 วทคณ ๑๙๒	Statistics สถิติศาสตร์	3 (3-0-6)	-			cancel
SCPY 160 วทฟส ๑๖๐	General Physics Laboratory ปฏิบัติการฟิสิกส์ทั่วไป	1 (0-3-1)	-			cancel
SCPY 164 วทฟส ๑๖๔	Physics for Medical Science ฟิสิกส์สำหรับวิทยาศาสตร์การแพทย์	3 (3-0-6)	-			cancel



Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Current program			Revised program			Remark
Major Required Courses			Major Required Courses (67 credits)			
-			SCBM 121 วทชพ ๑๒๑	Cell and Molecular Biology ชีววิทยาระดับเซลล์และโมเลกุล	2 (2-0-4)	new course
SCBM 211 วทชพ ๒๑๑	Human Structure 1 โครงสร้างร่างกายมนุษย์ ๑	3 (1-4-4)	SCBM 211 วทชพ ๒๑๑	Human Structure 1 โครงสร้างร่างกายมนุษย์ ๑	3 (1-4-4)	no change
SCBM 212 วทชพ ๒๑๒	Human Structure 2 โครงสร้างร่างกายมนุษย์ ๒	3 (1-4-4)	SCBM 212 วทชพ ๒๑๒	Human Structure 2 โครงสร้างร่างกายมนุษย์ ๒	3 (1-4-4)	no change
SCBM 214 วทชพ ๒๑๔	Structures of Cell and Tissue โครงสร้างของเซลล์และเนื้อเยื่อ	3 (2-3-4)	SCBM 214 วทชพ ๒๑๔	Structures of Cell and Tissue โครงสร้างของเซลล์และเนื้อเยื่อ	3 (2-2-5)	no change
SCBM 281 วทชพ ๒๘๑	Biochemistry ชีวเคมี	3 (3-0-6)	SCBM 224 วทชพ ๒๒๔	Biochemistry ชีวเคมี	3 (3-0-6)	course code changed
SCBM 282 วทชพ ๒๘๒	Laboratory in Biochemistry ปฏิบัติการชีวเคมี	1 (0-2-1)	SCBM 225 วทชพ ๒๒๕	Laboratory in Biochemistry ปฏิบัติการชีวเคมี	1 (0-2-1)	course code changed
SCBM 231 วทชพ ๒๓๑	Fundamental Immunology ภูมิคุ้มกันวิทยาเบื้องต้น	1 (1-0-2)	-			cancel
SCBM 232 วทชพ ๒๓๒	Fundamental Microbiology ภูมิคุ้มกันวิทยาเบื้องต้น	2 (2-0-4)	-			cancel
-			SCBM 233 วทชพ ๒๓๓	Laboratory in Microbiology and Immunology ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา	1 (0-2-1)	new course
-			SCBM 234 วทชพ ๒๓๔	Fundamental Immunology ภูมิคุ้มกันวิทยาพื้นฐาน	1 (1-0-2)	new course
-			SCBM 235 วทชพ ๒๓๕	Fundamental Microbiology จุลชีววิทยาพื้นฐาน	2 (2-0-4)	new course
SCBM 221 วทชพ ๒๒๑	Physiology for Medical Sciences 1 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑	3 (3-0-6)	SCBM 261 วทชพ ๒๖๑	Physiology for Medical Sciences 1 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๑	2 (2-0-4)	course code and credit changed
SCBM 222 วทชพ ๒๒๒	Physiology for Medical Sciences 2 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒	3 (2-2-5)	SCBM 262 วทชพ ๒๖๒	Physiology for Medical Sciences 2 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๒	2 (2-0-4)	course code and credit changed
SCBM 223 วทชพ ๒๒๓	Physiology for Medical Sciences 3 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓	3 (3-0-6)	SCBM 263 วทชพ ๒๖๓	Physiology for Medical Sciences 3 สรีรวิทยาสำหรับวิทยาศาสตร์การแพทย์ ๓	3 (3-0-6)	course code changed
SCBM 215 วทชพ ๒๑๕	Medical Neuroscience ประสาทวิทยาศาสตร์การแพทย์	4 (3-2-7)	SCBM 312 วทชพ ๓๑๒	Medical Neuroscience ประสาทวิทยาศาสตร์การแพทย์	3 (2-2-5)	course code and credit changed
SCBM 381 วทชพ ๓๘๑	Medical Genetics พันธุศาสตร์การแพทย์	2 (2-0-4)	SCBM 321 วทชพ ๓๒๑	Medical Genetics พันธุศาสตร์การแพทย์	2 (2-0-4)	course code changed
-			SCBM 340 วทชพ ๓๔๐	Basic Cellular Pathology พื้นฐานพยาธิวิทยาระดับเซลล์	2 (2-0-4)	new course
SCBM 341 วทชพ ๓๔๑	General Pathology พยาธิวิทยาพื้นฐาน	2 (1-2-3)	SCBM 341 วทชพ ๓๔๑	General Pathology พยาธิวิทยาพื้นฐาน	2 (1-2-3)	no change
SCBM 342 วทชพ ๓๔๒	Systemic Pathology พยาธิวิทยาระบบ	4 (2-4-6)	SCBM 347 วทชพ ๓๔๗	Systemic Pathology พยาธิวิทยาระบบ	3 (2-2-5)	course code and credit changed
SCBM 451 วทชพ ๔๕๑	Principal Actions of Therapeutic Agents หลักการออกฤทธิ์ของยา	2 (2-0-4)	SCBM 351 วทชพ ๓๕๑	Principal Actions of Therapeutic Agents หลักการออกฤทธิ์ของยา	1 (1-0-2)	course code and credit changed
SCBM 452 วทชพ ๔๕๒	Pharmacology 1 เภสัชวิทยา ๑	3 (3-0-6)	SCBM 352 วทชพ ๓๕๒	Pharmacology 1 เภสัชวิทยา ๑	2 (2-0-4)	course code and credit changed



Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Current program			Revised program			Remark
SCBM 453 วทชพ ๔๕๓	Pharmacology 2 เภสัชวิทยา ๒	3 (3-0-6)	SCBM 353 วทชพ ๓๕๓	Pharmacology 2 เภสัชวิทยา ๒	2 (2-0-4)	course code and credit changed
-			SCBM 371 วทชพ ๓๗๑	Generic Skills in Science Research ทักษะทั่วไปในงานวิจัยทางวิทยาศาสตร์	1 (1-0-2)	new course
-			SCBM 372 วทชพ ๓๗๒	Laboratory Exploration ห้องปฏิบัติการการศึกษา	1 (1-0-2)	new course
-			SCBM 373 วทชพ ๓๗๓	Bioinformatics ชีวสารสนเทศ	2 (2-0-4)	new course
-			SCBM 374 วทชพ ๓๗๔	Gene Technology เทคโนโลยีด้านยีน	1 (0-2-1)	new course
-			SCBM 375 วทชพ ๓๗๕	Microscopy and Bioimaging จุลทรรศน์ศาสตร์และภาพชีวภาพ	2 (1-2-3)	new course
-			SCBM 376 วทชพ ๓๗๖	Cell Culture Techniques เทคนิคการเพาะเลี้ยงเซลล์	2 (1-2-3)	new course
-			SCBM 377 วทชพ ๓๗๗	Use of Experimental Animals for Scientific Research การใช้สัตว์ทดลองเพื่องานวิจัยทางวิทยาศาสตร์	1 (1-0-2)	new course
-			SCBM 490 วทชพ ๔๙๐	Scientific Research Planning การวางแผนงานวิจัยทางวิทยาศาสตร์	4 (0-8-4)	new course
-			SCBM 491 วทชพ ๔๙๑	Seminar in Biomedical Science 1 สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๑	1 (1-0-2)	new course
-			SCBM 492 วทชพ ๔๙๒	Seminar in Biomedical Science 2 สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๒	1 (1-0-2)	new course
SCBM 497 วทชพ ๔๙๗	Scientific Writing การเขียนโครงการวิจัยทางวิทยาศาสตร์	2 (2-0-4)	SCBM 496 วทชพ ๔๙๖	Scientific Writing การเขียนงานทางวิทยาศาสตร์	2 (2-0-4)	course code changed
SCBM 499 วทชพ ๔๙๙	Senior Project โครงการวิจัย	6 (0-12-6)	SCBM 499 วทชพ ๔๙๙	Senior Project โครงการวิจัย	6 (0-12-6)	no change
SCBM 213 วทชพ ๒๑๓	Human Embryology วิทยาเอ็มบริโอมนุษย์	2 (2-0-4)	-			cancel
SCBM 251 วทชพ ๒๕๑	Cell and Molecular Medicine เวชศาสตร์ระดับเซลล์และโมเลกุลขั้นพื้นฐาน	3 (3-0-6)	-			cancel
SCBM 343 วทชพ ๓๔๓	Clinical Pathology พยาธิวิทยาคลินิก	2 (1-2-3)	-			cancel
SCBM 498 วทชพ ๔๙๘	Seminar in Biomedical Sciences สัมมนาทางวิทยาศาสตร์ชีวการแพทย์	1 (1-0-2)	-			cancel
SCID 301 วทศร ๓๐๑	Systems Ecology and Disease Emergence นิเวศวิทยาเชิงระบบและอุบัติการณ์โรค	3 (3-0-6)	-			cancel
SCID 302 วทศร ๓๐๒	Gene Technology เทคโนโลยีด้านยีน	1 (0-2-1)	-			cancel



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TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Current program			Revised program			Remark
Major Elective Courses			Major Elective Courses (10 credits)			
			Module A: Neuroscience			
-			SCAN 311 วทกว ๓๑๑	Cellular and Molecular Neuroscience ประสาทวิทยาศาสตร์ระดับเซลล์และโมเลกุล	3 (3-0-6)	new course
-			SCAN 312 วทกว ๓๑๒	Techniques in Neuroscience Research เทคนิคในงานวิจัยทางประสาทวิทยาศาสตร์	3 (2-2-5)	new course
-			SCAN 411 วทกว ๔๑๑	Neurodegeneration and Neuroregeneration การเสื่อมสภาพและการฟื้นฟูสภาพของระบบประสาท	2 (2-0-4)	new course
-			SCAN 412 วทกว ๔๑๒	Innovation in Clinical Neuroscience นวัตกรรมของประสาทวิทยาศาสตร์เชิงคลินิก	2 (2-0-4)	new course
			Module B: Cell and Molecular Medicine			
-			SCBC 321 วทชค ๓๒๑	Molecular Aspects of Human Diseases ลักษณะระดับโมเลกุลของโรคในมนุษย์	3 (3-0-6)	new course
-			SCBC 322 วทชค ๓๒๒	Laboratory Rotation in Cell and Molecular Medicine การเวียนห้องปฏิบัติการทางเวชศาสตร์ระดับเซลล์และโมเลกุล	3 (1-4-4)	new course
-			SCBC 421 วทชค ๔๒๑	Frontiers in Molecular Bioscience ขอบเขตความรู้สมัยใหม่ทางชีววิทยาศาสตร์โมเลกุล	2 (2-0-4)	new course
-			SCBC 422 วทชค ๔๒๒	Innovation in Translational Biomedicine นวัตกรรมทางชีวเวชศาสตร์บิรวรรต	2 (2-0-4)	new course
			Module C: Medical Microbiology			
SCBM 331 วทชพ ๓๓๑	Medical Bacteriology แบคทีเรียวิทยาทางการแพทย์	2 (1-2-3)	SCMI 331 วทจข ๓๓๑	Medical Bacteriology แบคทีเรียวิทยาทางการแพทย์	2 (1-2-3)	course code changed
SCBM 332 วทชพ ๓๓๒	Medical Mycology and Parasitology วิทยาเชื้อราและปรสิตวิทยาทางการแพทย์	2 (1-2-3)	SCMI 332 วทจข ๓๓๒	Medical Mycology and Parasitology วิทยาเชื้อราและปรสิตวิทยาทางการแพทย์	2 (1-2-3)	course code changed
SCBM 333 วทชพ ๓๓๓	Medical Virology ไวรัสวิทยาทางการแพทย์	2 (1-2-3)	SCMI 333 วทจข ๓๓๓	Medical Virology ไวรัสวิทยาทางการแพทย์	2 (1-2-3)	course code changed
-			SCMI 431 วทจข ๔๓๑	Human Immune System in Health and Diseases ระบบภูมิคุ้มกันของมนุษย์ในสภาวะปกติและการเกิดโรค	1 (1-0-2)	New course
-			SCMI 432 วทจข ๔๓๒	Current Research in Infectious Diseases หัวข้อวิจัยที่ทันสมัยทางโรคติดเชื้อ	1 (1-0-2)	new course
			Module D: Novel Therapeutic Strategies and Diagnosis			
-			SCPA 341 วทพร ๓๔๑	Cancer Biology and Novel Biomarkers ชีววิทยาโรคมะเร็งและตัวบ่งชี้ทางชีวภาพแนวใหม่	2 (2-0-4)	new course
-			SCPA 342 วทพร ๓๔๒	Biological Aging and Regenerative Medicine ความชราภาพทางชีววิทยาและเวชศาสตร์ฟื้นฟูชะลอวัย	2 (2-0-4)	new course



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			Module D: Novel Therapeutic Strategies and Diagnosis (cont.)		
-			SCPA 343 วทพธ ๓๔๓	Discovery of Potential Therapy in Non-Communicable Diseases การค้นพบการรักษาที่เป็นไปได้ของกลุ่มโรคไม่ติดต่อ	2 (2-0-4) new course
-			SCPA 441 วทพธ ๔๔๑	Diagnosis and Control of Infectious Diseases การวินิจฉัยและการควบคุมโรคติดต่อ	2 (2-0-4) new course
-			SCPA 442 วทพธ ๔๔๒	Novel Research on Therapeutic Strategies and Diagnosis ปฏิบัติการและงานวิจัยสมัยใหม่ที่เกี่ยวข้องกับกลยุทธ์ในการรักษาและวินิจฉัยโรค	2 (0-4-2) new course
			Module E: Frontiers in Drug Discovery and Therapeutic Perspectives		
-			SCPM 351 วทภส ๓๕๑	Clinical Pharmacology เภสัชวิทยาคลินิก	2 (2-0-4) new course
-			SCPM 352 วทภส ๓๕๒	Seminar in Pharmacology สัมมนาทางเภสัชวิทยา	2 (2-0-4) new course
-			SCPM 353 วทภส ๓๕๓	Precision Medicine การแพทย์แม่นยำ	2 (2-0-4) new course
-			SCPM 451 วทภส ๔๕๑	Cosmetics and Nutraceuticals เครื่องสำอางและโภชนเภสัชภัณฑ์	2 (1-2-3) new course
-			SCPM 452 วทภส ๔๕๒	Animal Models for Drug Testing การใช้สัตว์ตัวแบบเพื่อการทดสอบยา	2 (2-0-4) new course
			Module F: Translational Physiology		
-			SCPS 361 วทสร ๓๖๑	Physiology of Aging สรีรวิทยาของภาวะความชรา	2 (2-0-4) new course
-			SCPS 362 วทสร ๓๖๒	Exercise Physiology สรีรวิทยาการออกกำลังกาย	2 (1-2-3) new course
-			SCPS 363 วทสร ๓๖๓	Seminar in Translational Physiology สัมมนาทางสรีรวิทยาปริวรรต	2 (2-0-4) new course
-			SCPS 461 วทสร ๔๖๑	Brain, Mind and Behavior สมอง จิตใจ และพฤติกรรม	2 (2-0-4) new course
-			SCPS 462 วทสร ๔๖๒	Trends in Translational Physiology แนวโน้มทางสรีรวิทยาปริวรรต	2 (1-2-3) new course
SCBM 301 วทขพ ๓๐๑	Tissue Regenerative Medicine เวชศาสตร์การฟื้นตัวของเนื้อเยื่อ	1 (1-0-2)	-		cancel
SCBM 302 วทขพ ๓๐๒	Regenerative Neurobiology การฟื้นตัวของระบบประสาท	2 (2-0-4)	-		cancel
SCBM 303 วทขพ ๓๐๓	Aging of Central Nervous System ความเสื่อมของระบบประสาทส่วนกลาง	2 (2-0-4)	-		cancel
SCBM 304 วทขพ ๓๐๔	Biological Science of Aging ชีววิทยาของความเสื่อม	2 (2-0-4)	-		cancel
SCBM 311 วทขพ ๓๑๑	Animal Models for Diseases โมเดลสัตว์ทดลองในการศึกษาโรค	1 (1-0-2)	-		cancel
SCBM 334 วทขพ ๓๓๔	Human Immune Response การตอบสนองทางภูมิคุ้มกันของมนุษย์	2 (1-2-3)	-		cancel
SCBM 344 วทขพ ๓๔๔	Cellular and Molecular Pathology พยาธิวิทยาระดับเซลล์และโมเลกุล	2 (2-0-4)	-		cancel
SCBM 345 วทขพ ๓๔๕	Cancer Biology ชีววิทยามะเร็ง	1 (1-0-2)	-		cancel



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SCBM 346 วทชพ ๓๔๖	Tropical Infectious Diseases and Controls โรคติดต่อเขตร้อนกับการควบคุม	2 (2-0-4)				cancel
SCID 306 วทคร ๓๐๖	Animal Cell Culture Techniques เทคนิคการเพาะเลี้ยงเซลล์สัตว์	2 (0-2-1)	-			cancel
SCID 307 วทคร ๓๐๗	Separation Techniques เทคนิคการแยกสาร	2 (0-2-1)	-			cancel
SCID 308 วทคร ๓๐๘	Application of Microscopy การประยุกต์ใช้จุลทรรศน์ศาสตร์	2 (1-2-3)	-			cancel
Elective courses (8 credits)			Elective courses (6 credits)			
-			SCBM 201 วทชพ ๒๐๑	Science of Happiness วิทยาศาสตร์แห่งความสุข	1 (1-0-2)	new course
-			SCBM 202 วทชพ ๒๐๒	Strictly Come Ballroom Dancing เกิดมาเพื่อเต้น	1 (0-2-1)	new course
SCID 203 วทคร ๒๐๓	Laboratory Exploration ห้องปฏิบัติการศึกษา	1 (1-0-2)	-			cancel
SCID 303 วทคร ๓๐๓	Bioinformatics ชีวสารสนเทศ	2 (2-0-4)	-			cancel
SCID 304 วทคร ๓๐๔	Animal Experimentation การทดลองที่ใช้สัตว์	1 (0-2-1)	-			cancel
SCID 305 วทคร ๓๐๕	Generic Skills in Science Research ทักษะทั่วไปในการวิจัยทางวิทยาศาสตร์	1 (1-0-2)	-			cancel



6. Program Structure after Revision compared to the previous structure and the undergraduate curriculum standard and guidelines issued by the Commission of Higher Education B.E. 2558.

Course Category	Standard Guideline of the Ministry of Education for the Undergraduate Level of Education of the Year 2015 (4-Year Program) (credits)	Current Program		Revised Program	
		Plan A (credits)	Plan B (credits)	Plan A (credits)	Plan B (credits)
1. General Education Courses	no less than 30	30	30	30^a	30^a
1) Social Sciences and Humanities		4	4		
2) Languages		8	8		
3) Science and Mathematics		18	18		
4) Health and Recreation		-	-		
2. Specific Courses	no less than 72	97	50^b+240^c	96	45^b+240^c
1) Core Courses				19	19 ^b +0 ^c
2) Major Required Courses				67	26 ^b +150 ^c
3) Major Elective Courses (Module)				10	0 ^b +90 ^c
3. Free Elective Courses	no less than 6	8	8	6	6
Total Credits	no less than 120	133	86^b +240^c	132	81^b+240^c

^a Students have to complete the General Education courses. Students may choose the General Education courses provided by other programs/departments/faculties to fulfill the credit requirement.

^b Credits while studying at Mahidol University

^c Credits while studying at the University of Sussex



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Appendix 6

Details of the Instructors Responsible for the Program and Regular Instructors



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Appendix for Details of the Instructors Responsible for the Program and Regular instructors

a. Instructors Responsible for the Program and Regular Instructors

1. Full name Mr.Niwat Kangwanrangsan

Title / Academic title Lecturer Dr.

Affiliation Department of Pathobiology, Faculty of Science, Mahidol University

Work Place Department of Pathobiology, Faculty of Science, Mahidol University

Education

Degree	Field of Study	Institution	Year
Ph.D.	Medical Science	Ehime University, Japan	2013
M.Sc.	Anatomy	Mahidol University, Thailand	2004
B.Sc.	Biology	Mahidol University, Thailand	1998

Research interests or research skills

- 1) Biology of malaria parasites in transmission stages
- 2) Malaria transmission-blocking vaccines and drugs development
- 3) Intervention of *P. vivax* liver stage development in humanized mice
- 4) Study of Plasmodium gene function by genetic manipulation

Research or academic works (according to Standards Criteria for the Higher Education Curriculum (B.E. 2558))

● Academic works

- 1) Lecturer, Department of Pathobiology, Faculty of Science, Mahidol University (November 2015 – present)
- 2) Program Chair, Bachelor of Science (Biomedical Science), Faculty of Science, Mahidol University. (October 2016 – present)

● Research papers

- 1) Bertschi NL, Voorberg-van der Wel A, Zeeman AM, Schuier S, Nigsch F, Carbone W, Knehr J, Gupta DK, Hofman SO, van der Werff N, Nieuwenhuis I, Klooster E, Faber BW, Flannery EL, Mikolajczak SA, Chuenchob V, Shrestha B, Beibel M, Bouwmeester T, **Kangwanrangsan N**, Sattabongkot J, Diagana TT, Kocken CH, Roma G. Transcriptomic analysis reveals reduced transcriptional activity in the malaria parasite *Plasmodium cynomolgi* during progression into dormancy. *Elife*. 2018;7. pii: e41081.
- 2) Arredondo SA, Swearingen KE, Martinson T, Steel R, Dankwa DA, Harupa A, Camargo N, Betz W, Vigdorovich V, Oliver BG, **Kangwanrangsan N**, Ishino T, Sather N, Mikolajczak S, Vaughan AM, Torii M, Moritz RL, Kappe SHI. The micronemal plasmodium proteins P36 and P52 act in concert to establish the replication-permissive compartment within infected hepatocytes. *Front Cell Infect Microbiol*. 2018;8:413.
- 3) Jenwithisuk R, **Kangwanrangsan N**, Tachibana M, Thongkukiatkul A, Otsuki H, Sattabongkot J, Tsuboi T, Torii M, Ishino T. Identification of a PH domain-containing protein which is localized to crystalloid bodies of *Plasmodium ookinetes*. *Malar J*. 2018;17(1):466.
- 4) Gualdrón-López M, Flannery EL, **Kangwanrangsan N**, Chuenchob V, Fernandez-Orth D, Segui-Barber J, Royo F, Falcón-Pérez JM, Fernandez-Becerra C, Lacerda MVG, Kappe SHI, Sattabongkot J, Gonzalez JR,



- Mikolajczak SA, Del Portillo HA. Characterization of *Plasmodium vivax* proteins in plasma-derived exosomes from malaria-infected liver-chimeric humanized mice. *Front Microbiol.* 2018;9:1271.
- 5) Bunthitsakda W, Leelayuwapan H, Paha J, **Kangwanrangsan N**, Chawengkirttikul R, Ponpuak M, Ruchirawat S, Boonyarattanakalin S. Controlled rapid synthesis and in vivo immunomodulatory effects of LM $\alpha(1,6)$ mannan with an amine linker. *Carbohydr Polym.* 2018;195:420-31.
- 6) Kachenton S, Jiraungkoorskul W, **Kangwanrangsan N**, Tansatit T. Cytotoxicity and histopathological analysis of titanium nanoparticles via *Artemia salina*. *Environ Sci Pollut Res Int.* 2018:1-6.
- 7) Leelayuwapan H, **Kangwanrangsan N**, Chawengkirttikul R, Ponpuak M, Charlermroj R, Boonyarattanakalin K, Ruchirawat S, Boonyarattanakalin S. Synthesis and Immunological Studies of the Lipomannan Backbone Glycans Found on the Surface of *Mycobacterium tuberculosis*. *J Org Chem.* 2017;82(14):7190-9.
- 8) Mikolajczak SA, Vaughan AM, **Kangwanrangsan N**, Roobsoong W, Fishbaugher M, Yimamnuaychok N, Rezakhani N, Lakshmanan V, Singh N, Kaushansky A, Camargo N, Baldwin M, Lindner SE, Adams JH, Sattabongkot J, Kappe SH. *Plasmodium vivax* liver stage development and hypnozoite persistence in human liver-chimeric mice. *Cell Host Microbe.* 2015;17(4):526-35.

Teaching responsibility

Current teaching responsibility

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory-laboratory- self-study)
1	SCBM 341 วทชพ ๓๔๑	General Pathology พยาธิวิทยาพื้นฐาน	2 (1-2-3)
2	SCBM 342 วทชพ ๓๔๒	Systemic Pathology พยาธิวิทยาระบบ	4 (2-2-6)
3	SCBM 343 วทชพ ๓๔๓	Clinical Pathology พยาธิวิทยาคลินิก	2 (1-2-3)
4	SCBM 344 วทชพ ๓๔๔	Cellular and Molecular Pathology พยาธิวิทยาระดับเซลล์และโมเลกุล	2 (2-0-4)
5	SCBM 346 วทชพ ๓๔๖	Tropical Infectious Diseases and Controls โรคติดต่อเขตร้อนกับการควบคุม	2 (2-0-4)
6	SCBM 497 วทชพ ๔๙๗	Scientific Writing การเขียนโครงการวิจัยทางวิทยาศาสตร์	2 (2-0-4)
7	SCBM 498 วทชพ ๔๙๘	Seminar in Biomedical Sciences สัมมนาทางวิทยาศาสตร์ชีวการแพทย์	1 (1-0-2)
8	SCBM 499 วทชพ ๔๙๙	Senior Project โครงงานวิจัย	6 (0-12-6)



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No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory–laboratory– self-study)
9	SCID 301 วทศร ๓๐๑	Systems Ecology and Disease Emergence นิเวศวิทยาเชิงระบบและอุบัติการณ์โรค	3 (3-0-6)
10	SCID 305 วทศร ๓๐๕	Generic Skills in Science Research ทักษะทั่วไปในการวิจัยทางวิทยาศาสตร์	1 (1-0-2)

Teaching responsibility in the new program / revised program

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory–laboratory– self-study)
1	SCBM 340 วทชพ ๓๔๐	Basic Cellular Pathology พื้นฐานพยาธิวิทยาระดับเซลล์	2 (2-0-4)
2	SCBM 341 วทชพ ๓๔๑	General Pathology พยาธิวิทยาพื้นฐาน	2 (1-2-3)
3	SCBM 347 วทชพ ๓๔๗	Systemic Pathology พยาธิวิทยาระบบ	3 (2-2-5)
4	SCBM 490 วทชพ ๔๙๐	Scientific Research Planning การวางแผนงานวิจัยทางวิทยาศาสตร์	4 (0-8-4)
5	SCBM 491 วทชพ ๔๙๑	Seminar in Biomedical Science 1 สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๑	1 (1-0-2)
6	SCBM 492 วทชพ ๔๙๒	Seminar in Biomedical Science 2 สัมมนาทางวิทยาศาสตร์ชีวการแพทย์ ๒	1 (1-0-2)
7	SCBM 496 วทชพ ๔๙๖	Scientific Writing การเขียนงานทางวิทยาศาสตร์	2 (2-0-4)
8	SCBM 499 วทชพ ๔๙๙	Senior Project โครงการวิจัย	6 (0-12-6)
9	SCPA 441 วทพธ ๔๔๑	Diagnosis and Control of Infectious Diseases การวินิจฉัยและการควบคุมโรคติดต่อ	2 (2-0-4)
10	SCPA 442 วทพธ ๔๔๒	Novel Research on Therapeutic Strategies and Diagnosis งานวิจัยสมัยใหม่ที่เกี่ยวข้องกับกลยุทธ์ในการรักษาและวินิจฉัยโรค	2 (0-4-2)



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Faculty of Science
 Department of Pathobiology

2. Full name Mr.Somyoth Sridurongrit

Title / Academic title Assistant Professor Dr.

Affiliation Department of Anatomy, Faculty of Science, Mahidol University

Work Place Department of Anatomy, Faculty of Science, Mahidol University

Education

Degree	Field of Study	Institution	Year
Ph.D.	Pathobiology	University of Southern California, USA	2008
M.Sc.	Biochemistry and Molecular Biology	University of Southern California, USA	2004
B.Sc.	Biochemistry	Chulalongkorn University, Thailand	1999

Research interests or research skills

- 1) Cell-to-cell communication in development and diseases
- 2) The use of genetic engineered mouse model for biomedical research
- 3) Cellular and molecular mechanism of organ injuries
- 4) *In vivo* function of TGF- β superfamily signaling

Research or academic works (according to Standards Criteria for the Higher Education

Curriculum (B.E. 2558))

● Academic papers

- 1) **Sridurongrit S.** Tumor-suppressive and tumor-promoting role of TGF- β in hepatocellular carcinoma. *Int J Biol.* 2017;9(1):41-9.

● Research papers

- 1) **Sridurongrit S,** Ke C, Kongphat W, Pudgerd A, Suwannasing C. Abrogation of Alk5 in hepatic stellate cells decreases hepatic fibrosis and ameliorates liver damage in mice following treatment with thioacetamide. *Songklanakarin J Sci Techno.* 2018;40(3):314-20.
- 2) Kongphat W, Pudgerd A, **Sridurongrit S.** Hepatocyte-specific expression of constitutively active Alk5 exacerbates thioacetamide-induced liver injury in mice. *Heliyon.* 2017;3(5):e00305.



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Teaching responsibility

Current teaching responsibility

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory-laboratory- self-study)
1	SCBM 211 วทชพ ๒๑๑	Human Structure 1 โครงสร้างร่างกายมนุษย์ ๑	3 (1-4-4)
2	SCBM 212 วทชพ ๒๑๒	Human Structure 2 โครงสร้างร่างกายมนุษย์ ๒	3 (1-4-4)
3	SCBM 213 วทชพ ๒๑๓	Human Embryology วิทยาเอ็มบริโอมนุษย์	2 (2-0-4)
4	SCBM 214 วทชพ ๒๑๔	Structures of Cell and Tissue โครงสร้างของเซลล์และเนื้อเยื่อ	3 (2-3-5)
5	SCBM 311 วทชพ ๓๑๑	Animal Models for Diseases โมเดลสัตว์ทดลองในการศึกษาโรค	1 (1-0-2)

Teaching responsibility in the new program / revised program

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory-laboratory- self-study)
1	SCBM 103 วทชพ ๑๐๓	Figurative Language for Everyday Life โวหารภาพพจน์สำหรับชีวิตประจำวัน	1 (1-0-2)
2	SCBM 211 วทชพ ๒๑๑	Human Structure 1 โครงสร้างร่างกายมนุษย์ ๑	3 (1-4-4)
3	SCBM 212 วทชพ ๒๑๒	Human Structure 2 โครงสร้างร่างกายมนุษย์ ๒	3 (1-4-4)
4	SCBM 214 วทชพ ๒๑๔	Structures of Cell and Tissue โครงสร้างของเซลล์และเนื้อเยื่อ	3 (2-2-5)
5	SCAN 311 วทกว ๓๑๑	Cellular and Molecular Neuroscience ประสาทวิทยาศาสตร์ระดับเซลล์และโมเลกุล	3 (3-0-6)
6	SCAN 312 วทกว ๓๑๒	Techniques in Neuroscience Research เทคนิคในงานวิจัยทางประสาทวิทยาศาสตร์	3 (2-2-5)
7	SCAN 411 วทกว ๔๑๑	Neurodegeneration and Neuroregeneration การเสื่อมสภาพและการฟื้นฟูสภาพของระบบประสาท	2 (2-0-4)



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Faculty of Science
 Department of Pathobiology

3. Full name Mr.Somphong Narkpinit

Title / Academic title Lecturer, MD

Affiliation Department of Pathobiology, Faculty of Science, Mahidol University

Work Place Department of Pathobiology, Faculty of Science, Mahidol University

Education

Degree	Field of Study	Institution	Year
M.D.	Medicine	Chulalongkorn University, Thailand	2005

Research interests or research skills

High Mobility Group Box 1 (HMGB1)

Research or academic works (according to Standards Criteria for the Higher Education

Curriculum (B.E. 2558))

● Research papers

- 1) Tancharoen S, Shakya P, **Narkpinit S**, Dararat P, Kikuchi K. Anthocyanins Extracted from *Oryza sativa* L. Prevent fluorouracil-induced nuclear factor-**KB** activation in oral mucositis: in vitro and in vivo studies. Int J Mol Sci. 2018;19(10). pii: E2981.
- 2) Tancharoen S, Gando S, Binita S, Nagasato T, Kikuchi K, Nawa Y, Dararat P, Yamamoto M, **Narkpinit S**, Maruyama I. HMGB1 promotes intraoral palatal wound healing through RAGE-dependent mechanisms. Int J Mol Sci. 2016;17(11). pii: E1961.
- 3) Pruck-Ngern M, Pattaradilokrat S, Chumpolbanchorn K, Pimnon S, **Narkpinit S**, Harnyuttanakorn P, Buddhirakul P, Saiwichai T. Effects of artesunate treatment on *Plasmodium gallinaceum* transmission in the vectors *Aedes aegypti* and *Culex quinquefasciatus*. Vet Parasitol. 2015;207(1-2):161-5.
- 4) Chaichalotornkul S, Nararatwanchai T, **Narkpinit S**, Dararat P, Kikuchi K, Maruyama I, Tancharoen S. Secondhand smoke exposure-induced nucleocytoplasmic shuttling of HMGB1 in a rat premature skin aging model. Biochem Biophys Res Commun. 2015;456(1):92-7.



Degree ☒ Bachelor ☐ Master ☐ Doctoral

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Faculty of Science

Department of Pathobiology

Teaching responsibility

Current teaching responsibility

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory-laboratory- self-study)
1	SCBM 342 วทชพ ๓๔๒	Systemic Pathology พยาธิวิทยาระบบ	4 (2-2-6)

Teaching responsibility in the new program / revised program

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory-laboratory- self-study)
1	SCBM 347 วทชพ ๓๔๗	Systemic Pathology พยาธิวิทยาระบบ	3 (2-2-5)
2	SCPA 204 วทพธ ๒๐๔	Common Diseases in Various Age Groups โรคทั่วไปในกลุ่มวัยต่าง ๆ	2 (2-0-4)



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 Department of Pathobiology

4. Full name Mr.Tana Taechalertpaisarn

Title / Academic title Lecturer Dr.

Affiliation Department of Microbiology, Faculty of Science, Mahidol University

Work Place Department of Microbiology, Faculty of Science, Mahidol University

Education

Degree	Field of Study	Institution	Year
Ph.D.	Medical Parasitology	University of Melbourne, Australia	2015
B.Sc.	Biochemistry	Chulalongkorn University, Thailand	2006

Research interests or research skills

- 1) Fluorescence microscopy
- 2) Live-cell microscopy
- 3) Molecular mechanism of drug-resistant *Plasmodium falciparum*
- 4) Novel antimalaria drug discovery

Research or academic works (according to Standards Criteria for the Higher Education

Curriculum (B.E. 2558))

• Research papers

- 1) Kennedy AT, Schmidt CQ, Thompson JK, Weiss GE, **Taechalertpaisarn T**, Gilson PR, Barlow PN, Crabb BS, Cowman AF, Tham WH. Recruitment of factor H as a novel complement evasion strategy for blood-stage *Plasmodium falciparum* infection. *J Immunol.* 2016;196(3):1239-48.
- 2) Weiss GE, Gilson PR, **Taechalertpaisarn T**, Tham WH, de Jong NW, Harvey KL, Fowkes FJ, Barlow PN, Rayner JC, Wright GJ, Cowman AF, Crabb BS. Revealing the sequence and resulting cellular morphology of receptor-ligand interactions during *Plasmodium falciparum* invasion of erythrocytes. *PLoS Pathog.* 2015;11(2):e1004670.

Teaching responsibility

Current teaching responsibility

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory–laboratory– self-study)
1	SCBM 235 วทชพ ๒๓๕	Fundamental Microbiology จุลชีววิทยาพื้นฐาน	2 (2-0-4)
2	SCBM 332 วทชพ ๓๓๒	Medical Mycology and Parasitology วิทยาเชื้อราและปรสิตวิทยาทางการแพทย์	2 (1-3-4)



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Teaching responsibility in the new program / revised program

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory-laboratory- self-study)
1	SCBM 233 วทชพ ๒๓๓	Laboratory in Microbiology and Immunology ปฏิบัติการจุลชีววิทยาและภูมิคุ้มกันวิทยา	1 (0-2-1)
2	SCBM 235 วทชพ ๒๓๕	Fundamental Microbiology จุลชีววิทยาพื้นฐาน	2 (2-0-4)
3	SCMI 332 วทจช ๓๓๒	Medical Mycology and Parasitology วิทยาเชื้อราและปรสิตวิทยาทางการแพทย์	2 (1-2-3)
4	SCMI 432 วทจช ๔๓๒	Current Research in Infectious Diseases หัวข้อวิจัยที่ทันสมัยทางโรคติดเชื้อ	1 (1-0-2)



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 Department of Pathobiology

5. Full name Mr.Thaned Kangsamaksin

Title / Academic title Assistant Professor Dr.

Affiliation Department of Biochemistry, Faculty of Science, Mahidol University

Work Place Department of Biochemistry, Faculty of Science, Mahidol University

Education

Degree	Field of Study	Institution	Year
Ph.D.	Pathobiology and Molecular Medicine	Columbia University, USA	2011
M.A., M.Phil.	Pathobiology and Molecular Medicine	Columbia University, USA	2008
B.A.	Biochemistry	Columbia University, USA	2005

Research interests or research skills

- 1) Cell and molecular biology of solid tumors
- 2) Tumor angiogenesis and vasculogenic mimicry
- 3) Drug delivery and cancer nanomedicine

Research or academic works (according to Standards Criteria for the Higher Education

Curriculum (B.E. 2558))

● Academic papers

- 1) Udomprasert A, **Kangsamaksin T**. DNA origami applications in cancer therapy. Cancer Sci. 2017;108(8):1535-43.

● Research papers

- 1) Singrang N, Kittisenachai S, Roytrakul S, Svasti J, **Kangsamaksin T**. NOTCH1 regulates the viability of cholangiocarcinoma cells via 14-3-3 theta. J Cell Commun Signal. 2019;13(2):245-54.
- 2) Kasorn A, Loison F, **Kangsamaksin T**, Jongrungruangchok S, Ponglikitmongkol M. Terrein inhibits migration of human breast cancer cells via inhibition of the Rho and Rac signaling pathways. Oncol Rep. 2018;39(3):1378-86.
- 3) Chaithongyot S, Chomanee N, Charngkaew K, Udomprasert A, **Kangsamaksin T**. Aptamer-functionalized DNA nanosphere as a stimuli-responsive nanocarrier. Mater Lett. 2018;214:72-75.
- 4) **Kangsamaksin T**, Chaithongyot S, Wootthichairangsan C, Hanchaina R, Tangshewinsirikul C, Svasti J. Lupeol and stigmasterol suppress tumor angiogenesis and inhibit cholangiocarcinoma growth in mice via downregulation of tumor necrosis factor- α . PLoS One. 2017;12(12):e0189628.
- 5) Edwards AK, Glithero K, Grzesik P, Kitajewski AA, Munabi NC, Hardy K, Tan QK, Schonning M, **Kangsamaksin T**, Kitajewski JK, Shawber CJ, Wu JK. NOTCH3 regulates stem-to-mural cell differentiation in infantile hemangioma. JCI Insight. 2017;2(21):pii:93764.
- 6) Banerjee D, Hernandez SL, Garcia A, **Kangsamaksin T**, Sbiroli E, Andrews J, Forrester LA, Wei N, Kadenhe-Chiweshe A, Shawber CJ, Kitajewski JK, Kandel JJ, Yamashiro DJ. Notch suppresses angiogenesis and progression of hepatic metastases. Cancer Res. 2015;75(8):1592-602.
- 7) **Kangsamaksin T**, Murtomaki A, Kofler NM, Cuervo H, Chaudhri RA, Tattersall IW, Rosenstiel PE, Shawber CJ, Kitajewski J. NOTCH decoys that selectively block DLL/NOTCH or JAG/NOTCH disrupt angiogenesis by unique mechanisms to inhibit tumor growth. Cancer Discov. 2015;5(2):182-97.



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 Department of Pathobiology

Teaching responsibility

Current teaching responsibility

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory-laboratory- self- study)
1	SCID 102 วทศร ๑๐๒	Cell and Molecular Biology ชีววิทยาระดับเซลล์และโมเลกุล	2 (2-0-4)
2	SCBM 499 วทชพ ๔๙๙	Senior Project โครงงานวิจัย	6 (0-12-6)

Teaching responsibility in the new program / revised program

No.	Course Code (Thai)	Course Name (Thai)	Number of Credits (theory-laboratory- self-study)
1	SCBC 322 วทชค ๓๒๒	Laboratory Rotation in Cell and Molecular Medicine การเวียนห้องปฏิบัติการทางเวชศาสตร์ระดับเซลล์และ โมเลกุล	3 (1-4-4)
2	SCBC 421 วทชค ๔๒๑	Frontiers in Molecular Bioscience ขอบเขตความรู้สมัยใหม่ทางชีววิทยาศาสตร์โมเลกุล	2 (2-0-4)
3	SCBC 422 วทชค ๔๒๒	Innovation in Translational Biomedicine นวัตกรรมทางชีวเวชศาสตร์ปรัวรรต	2 (2-0-4)
4	SCBM 121 วทชพ ๑๒๑	Cell and Molecular Biology ชีววิทยาระดับเซลล์และโมเลกุล	2 (2-0-4)
5	SCBM 499 วทชพ ๔๙๙	Senior Project โครงงานวิจัย	6 (0-12-6)



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Table: Name Lists of Regular Instructors

No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
1	Ms.Charoensri Thonabulsombat	Associate Professor	Ph.D. (Reproductive Biology), Utah State University, USA M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Nursing), Mahidol University, Thailand	Department of Anatomy	Gonmanee T, Thonabulsombat C , Vongsavan K, Sritanandomchai H. Differentiation of stem cells from human deciduous and permanent teeth into spiral ganglion neuron-like cells. Arch Oral Biol. 2018;88:34-41.
2	Ms.Kanokpan Wongprasert	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Physical therapy), Mahidol University, Thailand	Department of Anatomy	Karnjana K, Soowannayan C, Wongprasert K . Ethanolic extract of red seaweed <i>Gracilaria fisheri</i> and furanone eradicate <i>Vibrio harveyi</i> and <i>Vibrio parahaemolyticus</i> biofilms and ameliorate the bacterial infection in shrimp. Fish Shellfish Immunol. 2019;88:91-101.
3	Ms.Kulathida Chaithirayanon	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Physical therapy), Mahidol University, Thailand	Department of Anatomy	Sangpairoj K, Apisawetakan S, Changklungmoa N, Kueakhai P, Chaichanasak P, Sobhon P, Chaithirayanon K . Potential of recombinant 2-Cys peroxiredoxin protein as a vaccine for <i>Fasciola gigantica</i> infection. Exp Parasitol. 2018;194:16-23.
4	Mr.Krai Meemon	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand B.Sc. (Physical therapy), Mahidol University, Thailand	Department of Anatomy	Malaiwong N, Chalorak P, Jattujan P, Manohong P, Niamnont N, Suphamungmee W, Sobhon P, Meemon K . Anti-Parkinson activity of bioactive substances extracted from <i>Holothuria leucospilota</i> . Biomed Pharmacother. 2019;109:1967-77.
5	Ms.Somluk Asuvapongpatana	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Nursing), Mahidol University, Thailand	Department of Anatomy	Timklay W, Magerd S, Sato C, Somrit M, Watthammawut A, Senarai T, Weerachatanukul W, Kitajima K, Asuvapongpatana S . N-linked mannose glycoconjugates on shrimp thrombospondin, pmTSP-II, and their involvement in the sperm acrosome reaction. Mol Reprod Dev. 2019; 86(4):440-9.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
6	Mr.Wattana Weerachayanukul	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Physical Therapy), Mahidol University, Thailand	Department of Anatomy	Jariyapong P, Pudgerd A, Cheloh N, Hirano I, Kondo H, Vanichviriyakit R, Weerachayanukul W , et al. Hematopoietic tissue of <i>Macrobrachium rosenbergii</i> plays dual roles as a source of hemocyte hematopoiesis and as a defensive mechanism against <i>Macrobrachium rosenbergii</i> nodavirus infection. Fish Shellfish Immunol. 2019;86:756-63.
7	Mr.Yotsawan Tinikul	Associate Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Zoology), Chiang Mai University, Thailand	Department of Anatomy	Khornchatr K, Saetan J, Thongbuakaew T, Senarai T, Kruangkum T, Kornthong N, Tinikul Y , et al. Distribution of abalone egg-laying hormone-like peptide in the central nervous system and reproductive tract of the male mud crab, <i>Scylla olivacea</i> . Acta Histochem. 2019;121(2):143-50.
8	Mr.Chinnawut Suriyonplengsaeng	Assistant Professor	Diploma of Thai Board of Pathology in Anatomic Pathology M.D., Mahidol University, Thailand	Department of Anatomy	Suriyonplengsaeng C , Dejthevaporn C, Khongkhatithum C, Sanpapant S, Tubthong N, Pinradap K, et al. Immunohistochemistry of sarcolemmal membrane-associated proteins in formalin-fixed and paraffin-embedded skeletal muscle tissue: a promising tool for the diagnostic evaluation of common muscular dystrophies. Diagn Pathol. 2017;12(1):19.
9	Ms.Morakot Sroyraya	Assistant Professor	Ph.D. (Anatomy and Structural Biology), Mahidol University, Thailand. B.Sc. (Medical Technology), Thammasat University, Thailand	Department of Anatomy	Sroyraya M , Kaewphalug W, Anantachoke N, Poomtong T, Sobhon P, Srimongkol A, et al. Saponins enriched in the epidermal layer of <i>Holothuria leucospilota</i> body wall. Microsc Res Tech. 2018;81(10):1182-90.
10	Mr.Nopporn Jongkamonwiwat	Assistant Professor	Ph.D. (Neuroscience), Mahidol University, Thailand B.Sc. (Physical Therapy), Srinakharinvirot University, Thailand	Department of Anatomy	Krityakiarana W, Sompup K, Jongkamonwiwat N , Mukda S, Pinilla FG, Govitrapong P, et al. Effects of melatonin on severe crush spinal cord injury-induced reactive astrocyte and scar formation. J Neurosci Res. 2016;94(12):1451-9.



Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

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Department of Pathobiology

No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
11	Ms.Rapeepun Vanichviriyakit	Assistant Professor	Ph.D. (Anatomy), Mahidol University, Thailand B.Sc. (Physical Therapy), Srinakharinvirot University, Thailand	Department of Anatomy	Pudgerd A, Chotwiwatthanakun C, Kruangkum T, Itsathitphaisarn O, Sritunyalucksana K, Vanichviriyakit R . The hematopoietic organ of <i>Macrobrachium rosenbergii</i> : Structure, organization and immune status. Fish Shellfish Immunol. 2019;88:415-23.
12	Mr.Somyoth Sridurongrit	Assistant Professor	Ph.D. (Pathobiology), University of Southern California, USA M.Sc. (Biochemistry and Molecular Biology), University of Southern California, USA B.Sc. (Biochemistry), Chulalongkorn University, Thailand	Department of Anatomy	Sridurongrit S , Ke C, Kongphat W, Pudgerd A, Suwannasing C. Abrogation of Alk5 in hepatic stellate cells decreases hepatic fibrosis and ameliorates liver damage in mice following treatment with thioacetamide. Songklanakarin J Sci Techno. 2018;40(3):314-20.
13	Mr.Worawit Suphamungmee	Assistant Professor	Ph.D. (Anatomy), Mahidol University, Thailand M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Radiological Technology), Chiang Mai University, Thailand	Department of Anatomy	Malaiwong N, Chalorak P, Jattujan P, Manohong P, Niamnont N, Suphamungmee W , Sobhon P, Meemon K. Anti-Parkinson activity of bioactive substances extracted from <i>Holothuria leucospilota</i> . Biomed Pharmacother. 2019;109:1967-77.
14	Ms.Monsicha Somrit	Lecturer	Ph.D. (Anatomy), Mahidol University, Thailand B.Sc. (Physical therapy), Chiang Mai University, Thailand	Department of Anatomy	Timklay W, Magerd S, Sato C, Somrit M , Waththammawut A, Senarai T, et al. N-linked mannose glycoconjugates on shrimp thrombospondin, pmTSP-II, and their involvement in the sperm acrosome reaction. Mol Reprod Dev. 2019;86(4):440-9.
15	Mr.Sittipon Intarapat	Lecturer	Ph.D. (Developmental Biology and Stem Cell Biology), University College London, UK M.Sc. (Zoology), Chulalongkorn University, Thailand B.Sc. (Biology), Prince of Songkla University, Thailand	Department of Anatomy	Jean C, Oliveira NM, Intarapat S , Fuet A, Mazoyer C, De Almeida I, et al. Transcriptome analysis of chicken ES, blastodermal and germ cells reveals that chick ES cells are equivalent to mouse ES cells rather than EpiSC. Stem Cell Res. 2015;14(1):54-67.
16	Mr.Thanapong Kruangkum	Lecturer	Ph.D. (Anatomy), Mahidol University, Thailand B.Sc. (Biology), Chiang Mai University, Thailand	Department of Anatomy	Pudgerd A, Chotwiwatthanakun C, Kruangkum T , Itsathitphaisarn O, Sritunyalucksana K, Vanichviriyakit R. The hematopoietic organ of <i>Macrobrachium rosenbergii</i> : Structure, organization and immune status. Fish Shellfish Immunol. 2019;88:415-23.


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No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
17	Mr.Sarawut Jitrapakdee	Professor	Ph.D. (Biochemistry), University of Adelaide, Australia M.Sc. (Biochemistry), Mahidol University, Thailand B.Sc. (Biology), Mahidol University, Thailand	Department of Biochemistry	Adina-Zada A, Jitrapakdee S , Attwood PV. Characterization of the kinetics and activation thermodynamics of intra- and inter-organism hybrid tetramers of pyruvate carboxylase. Arch Biochem Biophys. 2019;665:87-95.
18	Mr.Jirundon Yuvaniyama	Associate Professor	Ph.D. (Biological Chemistry), University of Michigan, USA B.Sc. (Chemistry), Mahidol University, Thailand	Department of Biochemistry	Boonyalai N, Sittikul P, Yuvaniyama J . <i>Plasmodium falciparum</i> Plasmeprin V (PfPMV): Insights into recombinant expression, substrate specificity and active site structure. Mol Biochem Parasitol. 2015;201(1):5-15.
19	Mr.Kittisak Yokthongwattana	Associate Professor	Ph.D. (Agricultural & Environmental Chemistry), University of California (Berkeley), USA B.S. (Biology), Rensselaer Polytechnic Institute, USA	Department of Biochemistry	Traewachiwiphak S, Yokthongwattana C, Ves-Urai P, Charoensawan V, Yokthongwattana K . Gene expression and promoter characterization of heat-shock protein 90B gene (HSP90B) in the model unicellular green alga <i>Chlamydomonas reinhardtii</i> . Plant Sci. 2018;272:107-16.
20	Mr.Laran T. Jensen	Associate Professor	Ph.D. (Biochemistry), University of Utah, USA B.Sc. (Chemistry, Physics, and Mathematics), Westminster College, USA	Department of Biochemistry	Aung HM, Huangteerakul C, Panwongsa W, Jensen AN, Chairoungdua A, Sukrong S, Jensen LT . Interrogation of ethnomedicinal plants for synthetic lethality effects in combination with deficiency in the DNA repair endonuclease RAD1 using a yeast cell-based assay. J Ethnopharmacol. 2018;223:10-21.
21	Ms.Rutaiwan Tohtong	Associate Professor	Ph.D. (Molecular Genetics), Ohio State University, USA B.Sc. (Microbiology), Chulalongkorn University, Thailand	Department of Biochemistry	Myint KZ, Kongpracha P, Rattanasinganchan P, Leelawat K, Moolthiya P, Chaiyabutr K, Tohtong R . Gadd45 β silencing impaired viability and metastatic phenotypes in cholangiocarcinoma cells by modulating the EMT pathway. Oncol Lett. 2018;15(3):3031-41.


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Department of Pathobiology

No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
22	Mr.Tavan Janvilisri	Associate Professor	Ph.D. (Pharmacology), University of Cambridge, UK M.Sc. (Oncology), University of Nottingham, UK B.Sc. (Biochemistry and Genetics), University of Nottingham, UK	Department of Biochemistry	Harnvoravongchai P, Chankhamhaengdech S, Ounjai P, Singhakaew S, Boonthaworn K, Janvilisri T . Antimicrobial effect of asiatic acid against <i>Clostridium difficile</i> is associated with disruption of membrane permeability. Front Microbiol. 2018;9:2125.
23	Ms.Tuangporn Suthiphongchai	Associate Professor	Ph.D. (Biochemistry), Mahidol University Post-Graduate Diploma (Biotechnology), International Inst. In Biotechnology Studies, UK B.Pharm. (Pharmacy), Mahidol University, Thailand	Department of Biochemistry	Sritanauwat P, Sueangoen N, Thummarati P, Islam K, Suthiphongchai T . Blocking ERK1/2 signaling impairs TGF- β 1 tumor promoting function but enhances its tumor suppressing role in intrahepatic cholangiocarcinoma cells. Cancer Cell Int. 2017;17:85.
24	Ms.Danaya Pakotiprapha	Assistant Professor	Ph.D. (Biochemistry), Harvard University, USA A.M. (Biology), Harvard University, USA B.A. (Biochemistry), Chulalongkorn University, Thailand	Department of Biochemistry	Chase J, Catalano A, Noble AJ, Eng ET, Olinares PD, Molloy K, Pakotiprapha D , et al. Mechanisms of opening and closing of the bacterial replicative helicase. Elife. 2018 Dec 24;7. pii: e41140.
26	Mr.Jamorn Somana	Assistant Professor	Ph.D. (Plant Biochemistry), University of Cambridge, UK M.D., Mahidol University, Thailand	Department of Biochemistry	Phoeurk C, Somana J , Sornwatana T, Udompaisarn S, Traewachiwiphak S, Sirichaiyakul P, et al. Three novel mutations in α -galactosidase gene involving in galactomannan degradation in endosperm of curd coconut. Phytochemistry. 2018;156:33-42.
27	Ms.Kanlaya Prapainop	Assistant Professor	Ph.D. (Biochemistry), University of Oxford, UK B.Sc. (Chemistry), Mahidol University, Thailand	Department of Biochemistry	Mekseriwattana W, Srisuk S, Kriangsaksri R, Niamsiri N, Prapainop K . The impact of serum proteins and surface chemistry on magnetic nanoparticle colloidal stability and cellular uptake in breast cancer cells. APS Pharm Sci Tech. 2019;20(2):55.
28	Ms.Kornkamon Lertsuwan	Assistant Professor	Ph.D. (Biological Science), University of Delaware, USA M.Sc. (Biology), Khon Kaen University, Thailand B.Sc. (Biology), Khon Kaen University, Thailand	Department of Biochemistry	Lertsuwan K , Nammultriputtak K, Nanthawuttiphon S, Phoaubon S, Lertsuwan J, Thongbunchoo J, et al. Ferrous and ferric differentially deteriorate proliferation and differentiation of osteoblast-like UMR-106 cells. Biometals. 2018;31(5):873-89.


Degree ☒ Bachelor ☐ Master ☐ Doctoral

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Department of Pathobiology

No.	Name-Surname	Academic Position	Degree (field)/ Institute/ Graduation Year	Affiliations	Most Recent Academic Works in 5 Years
29	Ms.Ornchuma Itsathitphaisarn	Assistant Professor	Ph.D. (Molecular Biophysics and Biochemistry) Yale University, USA M. Biochem. (Biochemistry) University of Oxford, UK	Department of Biochemistry	Pudgerd A, Chotwiwatthanakun C, Kruangkum T, Itsathitphaisarn O , Sritunyalucksana K, Vanichviriyakit R. The hematopoietic organ of <i>Macrobrachium rosenbergii</i> : Structure, organization and immune status. Fish Shellfish Immunol. 2019;88:415-23.
30	Ms.Ruchanok Tinikul	Assistant Professor	Ph.D. (Biochemistry), Mahidol University, Thailand M.Sc. (Biotechnology), Chiang Mai University, Thailand B.Sc. (Biochemistry and Biochemical Technology), Chiang Mai University, Thailand	Department of Biochemistry	Phonbuppha J, Maenpuen S, Munkajohnpong P, Chaiyen P, Tinikul R . Selective determination of the catalytic cysteine pK _a of two-cysteine succinic semialdehyde dehydrogenase from <i>Acinetobacter baumannii</i> using burst kinetics and enzyme adduct formation. FEBS J. 2018;285(13):2504-19.
31	Mr.Thaned Kangsamaksin	Assistant Professor	Ph.D. (Pathobiology & Molecular Medicine), Columbia University, USA M.Phil. (Pathobiology & Molecular Medicine), Columbia University, USA M.A. (Pathobiology & Molecular Medicine), Columbia University, USA B.A. (Biochemistry) Columbia University, USA	Department of Biochemistry	Singrang N, Kittisenachai S, Roytrakul S, Svasti J, Kangsamaksin T . NOTCH1 regulates the viability of cholangiocarcinoma cells via 14-3-3 theta. J Cell Commun Signal. 2019;13(2):245-54.
32	Mr.Varodom Charoensawan	Assistant Professor	Ph.D. (Molecular Biology), Cambridge University, UK M.Phil. (Computational Biology), Cambridge University, UK B.Eng. (Biochemical Engineering), University College London, UK	Department of Biochemistry	Kitdumrongthum S, Metheetrairut C, Charoensawan V , Ounjai P, Janpipatkul K, Panvongsa W, et al. Dysregulated microRNA expression profiles in cholangiocarcinoma cell-derived exosomes. Life Sci. 2018;210:65-75.
33	Mr.Mikhail Khvotchev	Lecturer	Ph.D. (Biochemistry), Shemyakin and Ovchinnikov Institute for Biorganic Chemistry, Russian Academy of Sciences, Russia Magna cum laude B.S., M.S. (Biororganic Chemistry and Biology), Lomonosov Moscow State University, Russia	Department of Biochemistry	Lui P, Khvotchev M , Li YC, Chanaday NL, Kavalali ET. Copine-6 binds to SNAREs and selectively suppresses spontaneous neurotransmission. J Neurosci. 2018;38(26):5888-99.
34	Mr.Patompon Wongtrakoongate	Lecturer	Ph.D. (Biomedical Science), University of Sheffield, UK B.Sc. (Biology), Mahidol University, Thailand	Department of Biochemistry	Srisanga K, Suthapot P, Permsirivisan P, Govitrapong P, Tungpradabkul S, Wongtrakoongate P . Polyphosphate kinase 1 of <i>Burkholderia pseudomallei</i> controls quorum sensing, RpoS and host cell invasion. J Proteomics. 2019;194:14-24.



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35	Mr.Sittinan Chanarat	Lecturer	Ph.D. (Biochemistry), University of Munich, Germany M.Eng. (Biological Information), Tokyo Institute of Technology, Japan B.Eng. (Bioengineering), Tokyo Institute of Technology, Japan	Department of Biochemistry	Chanarat S , Mishra SK. Emerging roles of ubiquitin-like proteins in pre-mRNA splicing. Trends Biochem Sci. 2018;43(11):896-907.
36	Ms.Waraporn Komyod	Lecturer	Ph.D. (Biochemistry), RWTH Aachen University, Germany M.Sc. (Biochemistry), Bielefeld University, Germany	Department of Biochemistry	Wasuworawong K, Roytrakul S, Paemanee A, Jindapornprasert K, Komyod W . Comparative proteomic analysis of human cholangiocarcinoma cell lines: S100A2 as a potential candidate protein inducer of invasion. W. Dis Markers. 2015;2015:629367.
37	Mr.Pongsak Utaisinchaoen	Professor	Ph.D. (Biochemistry), Colorado State University, USA B.Sc. (Medical Technology), Mahidol University, Thailand	Department of Microbiology	Pudla M, Srisatjaluk R, Utaisinchaoen P . Induction of inducible nitric oxide synthase (iNOS) in <i>Porphyromonas gingivalis</i> LPS-treated mouse macrophage cell line (RAW264.7) requires Toll-like receptor 9. Inflamm Res. 2018;67(9):723-6.
38	Mr.Prasit Palittapongarnpim	Professor	Dip. (Thai Board of Pediatrics), Chiang Mai University, Thailand M.D. (Hons), Mahidol University, Thailand B.Sc. (Medical Science), Mahidol University, Thailand B.Sc. (Mathematics), Ramkhamhaeng University, Thailand	Department of Microbiology	Chamchod F, Palittapongarnpim P . Modeling <i>Clostridium difficile</i> in a hospital setting: control and admissions of colonized and symptomatic patients. Theor Biol Med Model. 2019;16(1):2.
39	Ms.Marisa Ponpuak	Associate Professor	Ph.D. (Molecular Cell Biology), Washington University School of Medicine, USA B.Sc. (Molecular Biology), University of Wisconsin-Madison, USA	Department of Microbiology	Bunthitsakda W, Leelayuwapan H, Paha J, Kangwanrangsan N, Chawengkirttikul R, Ponpuak M , et al. Controlled rapid synthesis and in vivo immunomodulatory effects of LM $\alpha(1,6)$ mannan with an amine linker. Carbohydr Polym. 2018;195:420-31.
40	Ms.Ponpan Matangkasombut Choopong	Associate Professor	S.D. (Immunology and Infectious Diseases), Harvard University, USA American Board of Allergy Immunology, USA American Board of Internal Medicine, USA M.D. Chulalongkorn University, Thailand	Department of Microbiology	Opasawatchai A, Amornsupawat P, Jiravejchakul N, Chan-In W, Spoerk NJ, Manopwisedjaroen K, Singhasivanon P, Yingtaweesak T, Suraamornkul S, Mongkolsapaya J, Sakuntabhai A, Matangkasombut P , Loison F. Neutrophil activation and early features of NET formation are associated with dengue virus infection in human. Front Immunol. 2019;9:3007.


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41	Ms.Sureemas Buates	Associate Professor	Ph.D. (Molecular Parasitology), McGill University, Canada M.Sc. (Tropical Medicine), Mahidol University, Thailand B.Sc. (Medical Technology), Mahidol University, Thailand	Department of Microbiology	Sattabongkot J, Suansomjit C, Nguitragool W, Sirichaisinthop J, Warit S, Tiensuwan M, Buates S . Prevalence of asymptomatic Plasmodium infections with sub-microscopic parasite densities in the northwestern border of Thailand: a potential threat to malaria elimination. <i>Malar J</i> . 2018;17(1):329.
42	Mr.Fabien Loison	Assistant Professor	Ph.D. (Cellular Biology), Universite de Rennes 1, France M.Sc. (Biology and Health), University of Rennes 1, France B.Sc. (Biology, Cellular Biology and Physiology), University of Rennes 1, France	Department of Microbiology	Opasawatchai A, Amornsupawat P, Jiravejchakul N, Chan-In W, Spoerk NJ, Manopwisedjaroen K, Singhasivanon P, Yingtaweek S, Suraamornkul S, Mongkolsapaya J, Sakuntabhai A, Matangkasombut P, Loison F . Neutrophil activation and early features of NET formation are associated with Dengue virus infection in human. <i>Front Immunol</i> . 2019;9:3007.
43	Ms.Saowakon Paca-uccaralertkun	Assistant Professor	Ph.D. (Biochemistry), Attila Jozsef University, Szeged, Hungary M.Sc. (Biochemistry), Chulalongkorn University, Thailand B.Sc. (Radiological Technology), Mahidol University, Thailand	Department of Microbiology	Tochareontanaphol C, Sinthuwit T, Buathong B, Thita T, Promso S, Paca-Uccaralertkun S . New mutations of the ID1 gene in acute myeloid leukemia patients. <i>Pathobiology</i> . 2015;82(1):43-7.
44	Ms.Soraya Chaturongakul	Assistant Professor	Ph.D. (Microbiology), Cornell University, USA M.Sc. (Bacteriology), University of Wisconsin-Madison, USA B.Sc. (Genetics), University of Wisconsin-Madison, USA	Department of Microbiology	Nilchan N, Phetsang W, Nowwarat T, Chaturongakul S , Jiarpinitn C. Halogenated trimethoprim derivatives as multidrug-resistant <i>Staphylococcus aureus</i> therapeutics. <i>Bioorg Med Chem</i> . 2018;26(19):5343-8.
45	Mr.Suthep Wiyakrutta	Assistant Professor	Ph.D. (Microbiology), Mahidol University, Thailand M.Sc. (Pharm Analysis), University of Strathclyde, UK B.Pharm., Mahidol University, Thailand	Department of Microbiology	Jomrit J, Isarangkul D, Summpunn P, Wiyakrutta S . A kinetic spectrophotometric method for the determination of pyridoxal-5'-phosphate based on coenzyme activation of apo-d-phenylglycine aminotransferase. <i>Enzyme Microb Technol</i> . 2018;117:64-71.
46	Mr.Pakorn Aiewsakun	Lecturer	D.Phil. (Zoology), University of Oxford, UK M.Sc. (Bioinformatics and Theoretical Systems Biology), Imperial College, UK B.Sc. (Biological Science), Imperial College, UK	Department of Microbiology	Simmonds P, Aiewsakun P , Katzourakis A. Prisoners of war - host adaptation and its constraints on virus evolution. <i>Nat Rev Microbiol</i> . 2019;17(5):321-8.



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47	Ms.Radeekorn Akkarawongsapat	Lecturer	Ph.D. (Cellular and Molecular Biology), University of Wisconsin-Madison, USA B.Sc. (Bacteriology), University of Wisconsin-Madison, USA B.Sc. (Genetics), University of Wisconsin-Madison, USA	Department of Microbiology	Pailee P, Kuhakarn C, Sangsuwan C, Hongthong S, Piyachaturawat P, Suksen K, Jariyawat S, Akkarawongsapat R , et al. Anti-HIV and cytotoxic biphenyls, benzophenones and xanthenes from stems, leaves and twigs of <i>Garcinia speciosa</i> . <i>Phytochemistry</i> . 2018;147:68-79.
48	Mr.Tana Taechalertpaisarn	Lecturer	Ph.D. (Medical Parasitology), The University of Melbourne, Australia B.Sc. (Biochemistry), Chulalongkorn University, Thailand	Department of Microbiology	Kennedy AT, Schmidt CQ, Thompson JK, Weiss GE, Taechalertpaisarn T , Gilson PR, et al. Recruitment of factor H as a novel complement evasion strategy for blood-stage <i>Plasmodium falciparum</i> infection. <i>J Immunol</i> . 2016;196(3):1239-48.
49	Mr.Prasit Suwannalert	Associate Professor	Ph.D. (Pathobiology), Mahidol University, Bangkok, Thailand M.Sc. (Medical Biochemistry), Khon Kaen University, Thailand B.Sc. (Medical Technology), Naresuan University, Thailand	Department of Pathobiology	Aimvijarn P, Palipoch S, Okada S, Suwannalert P . Thai Water Lily extract induces B16 melanoma cell apoptosis and inhibits cellular invasion through the role of cellular oxidants. <i>Asian Pac J Cancer Prev</i> . 2018;19(1):149-53.
50	Ms.Wanee Jiraungkoorskul	Associate Professor	Ph.D. (Biology), Mahidol University, Thailand M.Sc. (Physiology), Mahidol University, Thailand B.Sc. (Medical Technology), Mahidol University, Thailand	Department of Pathobiology	Senarat S, Kettratad J, Kangwanrangsan N, Jiraungkoorskul W , Amano M, Shimizu A, et al. The sbGnRH-GTH system in the female short mackerel, <i>Rastrelliger brachysoma</i> (Bleeker, 1851), during breeding season: implications for low gamete production in captive broodstock. <i>Fish Physiol Biochem</i> . 2019;45(1):1-18.
51	Ms.Amornrat Jensen	Assistant Professor	Ph.D. (Toxicology), Johns Hopkins University, USA B.Sc. (Pharmaceutical Sciences), Chulalongkorn University, Thailand	Department of Pathobiology	Aung HM, Huangteerakul C, Panvongsa W, Jensen AN , Chairoungdua A, Sukrong S, et al. Interrogation of ethnomedicinal plants for synthetic lethality effects in combination with deficiency in the DNA repair endonuclease RAD1 using a yeast cell-based assay. <i>J Ethnopharmacol</i> . 2018;223:10-21.


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52	Ms.Pornthip Chaichompoo	Assistant Professor	Ph.D. (Immunology), Mahidol University, Thailand M.Sc. (Immunology), Mahidol University, Thailand B.Sc. (Medical Technology), Chiang Mai University, Thailand	Department of Pathobiology	Manakeng K, Prasertphol P, Phongpao K, Chuncharunee S, Tanyong D, Worawichawong S, Svasti S, Chaichompoo P . Elevated levels of platelet- and red cell-derived extracellular vesicles in transfusion-dependent β -thalassemia/HbE patients with pulmonary arterial hypertension. Ann Hematol. 2019;98(2):281-8.
53	Ms.Nisamanee Charoenchon	Lecturer	Ph.D. (Medicine), The University of Manchester, UK M.Sc. (Biotechnology), Chulalongkorn University, Thailand B.Sc. (Biology), Khon Kaen University, Thailand	Department of Pathobiology	Charoenchon N , Rhodes LE, Pilkington SM, Farrar MD, Watson REB. Differential reorganisation of cutaneous elastic fibres: a comparison of the in vivo effects of broadband ultraviolet B versus solar simulated radiation. Photochem Photobiol Sci. 2018;17(7):889-95.
54	Mr.Niwat Kangwanrangsan	Lecturer	Ph.D. (Medical Science), Ehime University, Japan M.Sc. (Anatomy), Mahidol University, Thailand B.Sc. (Biology), Mahidol University, Thailand	Department of Pathobiology	Bertschi NL, Voorberg-van der Wel A, Zeeman AM, Schuier S, Nigsch F, Carbone W, Knehr J, Gupta DK, Hofman SO, van der Werff N, Nieuwenhuis I, Klooster E, Faber BW, Flannery EL, Mikolajczak SA, Chuenchob V, Shrestha B, Beibel M, Bouwmeester T, Kangwanrangsan N , Sattabongkot J, Diagana TT, Kocken CH, Roma G. Transcriptomic analysis reveals reduced transcriptional activity in the malaria parasite Plasmodium cynomolgi during progression into dormancy. Elife. 2018;7. pii: e41081.
55	Mr.Somphong Narkpinit	Lecturer	M.D., Chulalongkorn University, Thailand	Department of Pathobiology	Tancharoen S, Shakya P, Narkpinit S , Dararat P, Kikuchi K. Anthocyanins extracted from <i>Oryza sativa</i> L. prevent fluorouracil-induced nuclear factor- κ B activation in oral mucositis: in vitro and in vivo studies. Int J Mol Sci. 2018;19(10). pii: E2981.


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56	Ms.Titipatima Sakulterdkiat	Lecturer	Ph.D. (Pathobiology), Mahidol University, Thailand B.Sc. (Molecular Cell Biology), California State University, USA	Department of Pathobiology	Doungchawee G, Sutdan D, Niwatayakul K, Inwisai T, Sitthipunya A, Boonsathorn N, Sakulterdkiat T , et al. Development and evaluation of an immunochromatographic assay to detect serum anti-leptospiral lipopolysaccharide IgM in acute leptospirosis. Sci Rep. 2017;7(1):2309.
57	Ms.Witchuda Payuhakrit	Lecturer	Ph.D. (Pathobiology), Mahidol University, Thailand B.Sc. (Medical Technology), Walailak University, Thailand	Department of Pathobiology	Suwanalert P, Payuhakrit W , Koomsang T. Anti-oxidant, pro-oxidant and anti-inflammatory effects of unpolished rice relevant to colorectal cancer. Asian Pac J Cancer Prev. 2016;17(12):5047-56.
58	Ms.Yaowarin Nakornpakdee	Lecturer	Ph.D. (Medical Microbiology), Khon Kaen University, Thailand M.Sc. (Medical Microbiology), Khon Kaen University, Thailand B.Sc. (Biology), Khon Kaen University, Thailand	Department of Pathobiology	Nakornpakdee Y , Sermswan RW, Maneewatchararangsi S, Wongratanacheewin S. Hamster IFN- γ +CD4+ and IL-4+CD4+ T cell responses against leptospire are significantly higher than those of mice. Asian Pac J Allergy Immunol. 2018;36(4):265-72.
59	Ms.Darawan Pinthong	Associate Professor	Ph.D. (Pharmacology), University of Nottingham, UK M.Sc. (Pharmacology), Mahidol University, Thailand B.Sc. (General Science), Chulalongkorn University, Thailand	Department of Pharmacology	Tungmannithum D, Pinthong D , Hano C. Flavonoids from <i>Nelumbo nucifera Gaertn.</i> , a medicinal plant: uses in traditional medicine, phytochemistry and pharmacological activities. Medicines. 2018;5(4):127.
60	Ms.Nattinee Jantaratnotai	Associate Professor	Dip. (Psychiatry), Ramathibodi Hospital, Mahidol University, Thailand Ph.D. (Pharmacology), Mahidol University, Thailand M.D. (Medicine), Siriraj Hospital, Mahidol University, Thailand B.Sc. (Medical Science), Mahidol University, Thailand	Department of Pharmacology	Puangsa-Ard Y, Thaweboon S, Jantaratnotai N , Pachimsawat P. Effects of reesterilization and storage time on sterility of paper/plastic pouches. Eur J Dent. 2018;12(3):417-21.
61	Ms.Ruedee Hemstapat	Associate Professor	Ph.D. (Pharmacy), The University of Queensland, Australia B.Sc. (Pharm), Rangsit University, Thailand	Department of Pharmacology	Tawonsawatruk T, Sriwatananukulkit O, Himakhun W, Hemstapat W . Comparison of pain behaviour and osteoarthritis progression between anterior cruciate ligament transection and osteochondral injury in rat models. Bone Jt Res. 2018;7(3):244-51.


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62	Ms.Pimtip Sanvarinda	Assistant Professor	Ph.D. (Pharmacology and Toxicology), University of California, USA M.D. Mahidol University, Thailand	Department of Pharmacology	Amnuaycheewa P, Rodiahwati W, Sanvarinda P , Cheenkachorn K, Tawai A, Sriyayanun M. Effect of organic acid pretreatment on Napier grass (<i>Pennisetum purpureum</i>) straw biomass conversion. <i>KMUTNB Int J Appl Sci Technol.</i> 2017;10(2).
63	Mr.Pansakorn Tanratana	Lecturer	Ph.D. (Cellular and Molecular Pathology), University of Madison-Wisconsin, USA M.D., Mahidol University, Thailand	Department of Pharmacology	Tanratana P , Ellery P, Westmark P, Mast AE, Sheehan JP. Elevated plasma factor IXa activity in premenopausal women on hormonal contraception. <i>Arterioscler Thromb Vasc Biol.</i> 2018;38(1):266-74.
64	Ms.Porn-tipa Korprasertthaworn	Lecturer	Ph.D. (Pharmacology), Mahidol University, Thailand M.Sc. (Pharmacology), Mahidol University, Thailand B.Sc. (Chemistry), Kasetsart University, Thailand	Department of Pharmacology	Polasek TM, Tucker GT, Sorich MJ, Wiese MD, Mohan T, Rostami-Hodjegan A, Korprasertthaworn P , et al. Prediction of olanzapine exposure in individual patients using physiologically based pharmacokinetic modelling and simulation. <i>Br J Clin Pharmacol.</i> 2018;84(3):462-76.
65	Mr.Somchai Yanrojana	Lecturer	Ph.D. (Pharmacology), Mahidol University, Thailand M.D., Mahidol University, Thailand	Department of Pharmacology	Sillapapongwarakorn S, Yanarojana S , Pinthong D, Thithapandha A, Ungwitayatorn J, Supavilai P. Molecular docking based screening of triterpenoids as potential G-quadruplex stabilizing ligands with anti-cancer activity. <i>Bioinformation.</i> 2017;23(9):284-92.
66	Ms.Somrudee Reabroi	Lecturer	Ph.D. (Physiology), Mahidol University, Thailand B.Sc. (Pharmaceutical Science), Ubon Ratchathani University, Thailand	Department of Pharmacology	Reabroi S , Saeeng R, Boonmuen N, Kasemsuk T, Saengsawang W, Suksen K, et al. The anti-cancer activity of an andrographolide analogue functions through a GSK-3 β -independent Wnt/ β -catenin signaling pathway in colorectal cancer cells. <i>Sci Rep.</i> 2018;8(1):7924.
67	Ms.Sutharinee Likitnukul	Lecturer	Ph.D. (Animal Physiology), Chulalongkorn University, Thailand D.V.M., Chulalongkorn University, Thailand	Department of Pharmacology	Likitnukul S, Kalandakanond-Thongsong S, Thammacharoen S. Effects of the short-term of growth hormone administration on plasma leptin in male diet-induced obesity rats. <i>J Physiol Sci.</i> 2018;68(suppl 1): S181.


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68	Ms.Jonggonnee Wattanapermpool	Professor	Ph.D. (Physiology and Biophysics), University of Illinois at Chicago, USA M.Sc. (Physiology), Mahidol University, Thailand B.Sc. (Radiological Technology), Mahidol University, Thailand	Department of Physiology	Rattanasopa C, Kirk JA, Bupha-Intr T, Papadaki M, de Tombe PP, Wattanapermpool J . Estrogen but not testosterone preserves myofilament function from doxorubicin-induced cardiotoxicity by reducing oxidative modifications. Am J Physiol Heart Circ Physiol. 2019;316(2):H360-H370.
69	Mr.Narattaphol Charoenphandhu	Professor	Ph.D. (Physiology), Mahidol University, Thailand MD. (Hons.), Mahidol University, Thailand B.Sc. (Medical Science), Mahidol University, Thailand	Department of Physiology	Tithito T, Suntornsaratoo P, Charoenphandhu N , Thongbunchoo J, Krishnamra N, Tang IM, et al. Fabrication of biocomposite scaffolds made with modified hydroxyapatite inclusion of chitosan-grafted-poly(methyl methacrylate) for bone tissue engineering. Biomed Mater. 2019;14(2):025013.
70	Mr.Arthit Chairoungdua	Associate Professor	Ph.D. (Medical Science), Kyorin University School of Medicine, Japan M.Sc. (Toxicology), Mahidol University, Thailand B.N.S. (Nursing Science), Khon Kaen University, Thailand	Department of Physiology	Kitdumrongthum S, Metheetrairut C, Charoensawan V, Ounjai P, Janpipatkul K, Panvongsa W, Weerachayaphorn J, Piyachaturawat P, Chairoungdua A . Dysregulated microRNA expression profiles in cholangiocarcinoma cell-derived exosomes. Life Sci. 2018;210:65-75.
71	Mr.Tepmanas Bupha-Intr	Associate Professor	Ph.D. (Physiology), Mahidol University, Thailand D.V.M. (Veterinary Medicine), Chulalongkorn University, Thailand	Department of Physiology	Jitmana R, Raksapharm S, Kijtaewornrat A, Saengsirisuwan V, Bupha-Intr T . Role of cardiac mast cells in exercise training-mediated cardiac remodeling in angiotensin II-infused ovariectomized rats. Life Sci. 2019;219:209-18.
72	Mr.Sunhapas Soodvilai	Associate Professor	Ph.D. (Physiology), Mahidol University, Thailand B.Pharm. (Pharmacy), Ubon Ratchathani University, Thailand	Department of Physiology	Soodvilai S, Tipparos W, Rangsimawong W, Patrojanasophon P, Soodvilai S , Sajomsang W, Opanasopit P. Effects of silymarin-loaded amphiphilic chitosan polymeric micelles on the renal toxicity and anticancer activity of cisplatin. Pharm Dev Technol. 2018;1-27.


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73	Mr.Vitton Saengsirisuwan	Associate Professor	Ph.D. (Physiological Sciences), University of Arizona, USA M.Sc. (Physiology of Exercise), Mahidol University, Thailand B.Sc. (Physical Therapy), Mahidol University, Thailand	Department of Physiology	Jitmana R, Raksapharm S, Kijawornrat A, Saengsirisuwan V , Bupha-Intr T. Role of cardiac mast cells in exercise training-mediated cardiac remodeling in angiotensin II-infused ovariectomized rats. Life Sci. 2019;219:209-18.
74	Ms.Jittima Weerachayaphorn	Assistant Professor	Ph.D. (Cellular Physiology and Molecular Biophysics), University of Texas Medical Branch at Galveston, USA M.Sc. (Physiology), Mahidol University, Thailand B.N.S. (Nursing Science), Mahidol University, Thailand	Department of Physiology	Franca A, Carlos Melo Lima Filho A, Guerra MT, Weerachayaphorn J , Loiola Dos Santos M, Njei B, et al. Effects of endotoxin on type 3 inositol 1,4,5-trisphosphate receptor in human cholangiocytes. Hepatology. 2019;69(2):817-30.
75	Mr.Ratchakrit Sriksuea	Assistant Professor	Ph.D. (Exercise Science), Mahidol University, Thailand M.Sc. (Sports Science), Mahidol University, Thailand B.Sc. (Sports Science), Mahidol University, Thailand	Department of Physiology	Sriksuea R , Suhatcho K. Impact of intramuscular administration of lipid-soluble and water-soluble vehicles into regenerating muscle at the distinct phases of skeletal muscle regeneration. J Physiol Sci. 2018;68(5):647-61.
76	Ms.Witchuda Saengsawang	Assistant Professor	Ph.D. (Physiology & Biophysics), University of Illinois at Chicago, USA B.S. (Pharmacy), Mahidol University, Thailand	Department of Physiology	Kwanthongdee J, Sunrat C, Munyoo B, Tuchinda P, Chabang N, Saengsawang W . Phyllanthus taxodiifolius Beille suppresses microtubule dynamics and restricts glioblastoma aggressiveness. Biomed Pharmacother. 2019;112:108645.
77	Mr.Kanit Bhukhai	Lecturer	Ph.D. (Biotherapy and Biotechnology), University of Paris Diderot, France M.Sc. (Physiology), Mahidol University, Thailand B.Sc. (Public Health), Mahidol University, Thailand	Department of Physiology	Bhukhai K , de Dreuzy E, Giorgi M, Colomb C, Negre O, Denaro M, et al. Ex vivo selection of transduced hematopoietic stem cells for gene therapy of β -hemoglobinopathies. Mol Ther. 2018;26(2):480-95.
78	Mr.Ioannis Papadimitriou	Lecturer	Ph.D. (Institute for Health and Sport), Victoria University, Australia M.Sc. (Human Performance and Health), Aristotle University, Greece B.Sc. (Physical Educational and Sports Science), Aristotle University, Greece	Department of Physiology	Papadimitriou ID , Lockey SJ, Voisin S, Herbert AJ, Garton F, Houweling PJ, et al. No association between ACTN3 R577X and ACE I/D polymorphisms and endurance running times in 698 Caucasian athlete. BMC Genomics. 2018;19:13.



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79	Mr.Nattapon Panupinthu	Lecturer	Ph.D. (Physiology), The University of Western Ontario, Canada B.Sc. (Biomedical Science), Mahidol University, Thailand	Department of Physiology	Rodrat M, Wongdee K, Panupinthu N , Thongbunchoo J, Teerapornpuntakit J, Krishnamra N, et al. Prolonged exposure to 1,25(OH) ₂ D ₃ and high ionized calcium induces FGF-23 production in intestinal epithelium-like Caco-2 monolayer: A local negative feedback for preventing excessive calcium transport. Arch Biochem Biophys. 2018;640:10-6.
80	Ms.Nittaya Boonmuen	Lecturer	M.Sc. (Physiology), Mahidol University, Thailand B.Sc. (Physical therapy), Chiang Mai University, Thailand	Department of Physiology	Reabroi S, Saeeng R, Boonmuen N , Kasemsuk T, Saengsawang W, Suksen K, et al. The anti-cancer activity of an andrographolide analogue functions through a GSK-3 β -independent Wnt/ β -catenin signaling pathway in colorectal cancer cells. Sci Rep. 2018;8(1):7924.
81	Mr.Stephen M.K. Chan	Lecturer	Ph.D. (Physiology), The University of New South Wales, Australia B.Sc. (Medicine Honours), The University of New South Wales, Australia B.Econ. (Agriculture), Macquarie University, Australia	Department of Physiology	Chan SC . Delay no more: struggles to re-imagine Hong Kong (for the next 30 years). Inter-Asia Cultural Studies. 2015;16(3):327-47.



Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Appendix 7

Mahidol University Regulations on Diploma and Undergraduate Studies
of the Year B.E. 2552 - 2560
and the Affiliation's Educational Announcements/Regulations



Mahidol University Regulations on Diploma and Undergraduate Studies, B.E. 2552 (2009)

Rules and guidelines for diploma and undergraduate studies are to be enforced in accordance with Mahidol University's act, 2007.

Mahidol University Council, under Section 24 (2) of Mahidol University Act B.E.2550 (2007), agreed to enact the following regulations in its 526th meeting, April 22, 2009.

Rule 1: These regulations are referred to as "Mahidol University Regulations on Diploma and Undergraduate Studies, B.E. 2552 (2009)"

Rule 2: These regulations shall become effective for the diploma and undergraduate students who enroll at Mahidol University in 2009 academic year onwards.

Rule 3: In these regulations

"University"	means	Mahidol University
"Faculty"	means	Faculties and divisions otherwise named, equivalent to other faculties that conduct teaching.
"Faculty committee"	means	Committee of the faculties and other divisions named equivalent to the faculties that conduct teaching.
"Dean"	means	Head of the faculties or other divisions, otherwise named, equivalent to the faculties that conduct teaching.
"Curriculum"	means	Diploma and undergraduate curriculum that supports the policies or operation or regulations and rules of Federations or Division of Art of Healing (if any) approved by the university council and acknowledged by the Higher Education Commission.
"Program Lecturers"	means	Lecturers in the diploma or undergraduate program.
"Program Committee"	means	Committee appointed by the Dean to manage and take the curriculum under consideration.



Rule 4: Admission

University or faculty, through the faculty committee, can accept students according to the conditions and methods indicated in the curriculum or the faculty's announcements approved by the president. Admission can be classified into three types;

- 4.1 Students are accepted by the quota system.
- 4.2 Students are accepted through the Office of Higher Education Commission.
- 4.3 Faculty can select and accept students directly according to the faculty's announcement which has been approved by the university.

Rule 5: Teaching System

- 5.1 **Semester System:** each academic year is divided into two regular semesters; Semester 1 and Semester 2. Each semester consists of at least 15 weeks broken into intervals. A faculty can organize a summer session if necessary. However, the summer session time period and registered credits must be comparable to the regular semester.
- 5.2 **Trimester System:** each academic year consists of three regular terms which are Trimester 1, Trimester 2, and Trimester 3, with at least 12 weeks in each trimester with semester breaks. The faculty can organize a summer session if necessary. However, the summer session time period and credit registration must be comparable to the regular semester.
- 5.3 **Others:** Faculty may use another system, the details of which must be clearly given in the curriculum period and credit registration must be equivalent to the semester or the trimester system.

Rule 6: Credits in each course are assigned according to the following criteria.

6.1 Semester System

- 1. A theoretical course with lectures or discussions or equivalent that is one hour per week or at least 15 hours per semester and two hours self-study per week or at least 30 hours per semester is assigned one semester credit.
- 2. A practical, laboratory course, or equivalent that is 2-3 hours per week or 30-45 hours per semester, and one hour self-study per week or 15 hours per semester is assigned one semester credit.



3. An internship, a project or any learning activity that has been assigned which is 3-6 hours per week or 45-90 hours per semester, and one hour self-study per week or 15 hours per semester is assigned one semester credit.

6.2 Trimester System

1. A theoretical lecture course or equivalent that is one hour per week or at least 12 hours per semester, and two hours self-study per week or at least 24 hours per semester is assigned one trimester credit.
2. A practice, laboratory course or equivalent that is 2-3 hours per week or 24-36 hours per semester, and one hour self-study per week or 12 hours per semester is assigned one trimester credit.
3. An internship, a project or any learning activity that has been assigned which is 3-6 hours per week or 36-72 hours per semester, and one hour self-study per week or 12 hours per semester is assigned one trimester credit.

6.3 If Rule 6.1 or 6.2 cannot be applied, the faculty committee or the person appointed by the faculty committee can assign the credits for each course as he/she sees fit and clearly details how they compare with the semester credit system in the curriculum.

Rule 7: Total credits and time of study

- 7.1 In an undergraduate study (4 years), the total number of credits must be at least 120 semester credits or 150 trimester credits, and the maximum time of study is 8 academic years.
- 7.2 In an undergraduate study (5 years), the total number of credits must be at least 150 semester credits or 187.5 trimester credits, and the maximum study time is 10 academic years.
- 7.3 In an undergraduate study (not less than 6 years), the total number of credits must be at least 180 semester credits or 225 trimester credits, and the maximum study time is 12 academic years.
- 7.4 In an undergraduate study (continuing), the total number of credits must be at least 72 semester credits or 90 trimester credits, and the maximum study time is 4 academic years.



An undergraduate study (continuing) has to be considered as part of an undergraduate study and must reflect the philosophy and contents of that particular undergraduate curriculum completely. The word “continuing” must be clearly written put in the parentheses after the name of the program.

In all cases, study time is to be counted from the first day of the first term for which the student has been accepted in that program.

Rule 8: Symbols showing evaluation results

8.1 Symbols and their assigned scores

Grade results of each course may be shown in symbolic type as follows;

Symbol	Score
A	4.00
B+	3.50
B	3.00
C+	2.50
C	2.00
D+	1.50
D	1.00
F	0.00

8.2 Symbols without scores

Grade results of each course may be shown in symbolic type as follows;

Symbol	Meaning
AU	Study which leads to no credit (Audit)
I	Awaiting for evaluation (Incomplete)
P	The study is incomplete (In Progress)
S	Satisfactory
T	Transfer of credit
U	Unsatisfactory
W	Withdraw
X	No report

8.3 Grading system



1. Symbols with at least 2.00 points, or the symbol S, means **Pass** in that course
2. Symbols with 1.00 or 1.5 points, or the symbol U, means that knowledge or ability of the student is below average. Other grading results are at the discretion of the faculty committee or the person appointed by the committee. On re-grading a course, the grade score will be 2.00 (or S), at the maximum.

8.4 F will be given in the following situations;

1. The student took the examination and failed in the exam or project.
2. The student was absent from the exam without any permission from the faculty committee or person appointed by the faculty committee.
3. The student was not allowed to take the exam according to Rule 11.
4. The student violated the examination regulation; for example, being late to the exam, dressed inappropriately according to student uniform regulation or act as in Rule 22.
5. The student who received an I and did not take the exam or finish the project within one regular semester or trimester after they received the I grade, except that the student has the permission as in Rules 15.1 and 15.2.
6. The student who received a P and did not take the exam and/or did not hand in report on time.
7. The student who does not re-take the exam or re-do the project as indicated in 8.3 (2), or the student has re-taken the exam or re-done the project and is still evaluated as "failed".

8.5 S or U are given only in non-credit courses or courses with credits for which the faculty has decided to use the non-score grading system.

8.6 AU is given only in the courses in which the student gives his/her intention to study for no credit and the student must participate in classes or practical activities not less than 80 percent of the total study time and practice time period must not be less than 80 percent.

8.7 I will be given in according to the following situations;

1. The student did not come to the exam or did not hand in the report in time due to ill health, as evidenced by a medical certificate endorsed by the university's Health Service Unit. However, the final decision will be made by the person appointed by the committee.



2. The student was not allowed to take the exam according to Rule 11 due to ill health, as evidenced by a medical certificate endorsed by the university's Health Service Unit. However, the final decision will be made by the committee.
3. The student was not able to take the exam or hand in the report due to force majeure. However, the final decision will be made by the person appointed by the committee.

8.8 **P can be** given only in the courses in which the classes are still on going, and/or the courses last longer than one semester/trimester.

8.9 **T can be given** in the case that the credits for the course have been transferred from another faculty or institute.

8.10 **W will be given** in the following situations;

1. The student is allowed to withdraw from the courses according to Rule 10.3.
2. The student is allowed to take a leave.
3. The student is suspended.

8.11 **X can be given** only in courses in which the faculty has not yet received the grade report.

Rule 9: Registration

Students have to register for courses and the total credits must be no less than specified in the curriculum according in the following criteria.

9.1 For a full time student, the number of registered credits should be no less than 9 and no more than 22 credits in each regular session. In the summer session, the number of registered credits can be no greater than 9. Registration will be completed only if the student has completed everything in the specified time period.

The faculty may allow registration which differs from the above criteria if necessary. However, changes must not disrupt the standard and quality of learning, while the total number of registered credits must be as specified in the curriculum

.

9.2 Re-registration or re-grading can be done in the following situations;

1. The student received F or W or U, or the committee or the person appointed by the committee agreed that the student should re-grade according to Rule 8.3(2). If it is an



elective course, a student is allowed to register for any other elective courses instead.

Or,

2. The student has to re-grade in order to improve CUM-GPA, in which case the approval of the advisor and instructor is needed.
3. The student is allowed to re-grade in each course as stated in Rules 9.2(1) and 9.2 (2), at the number of times set by the faculty, but no more than twice, except when the student has been allowed to take a leave according to Rules 15.1(2), 15.1(2), and 15.1(3).

9.3 Registration in more than one program

A student who wants to study in more than one program can register for courses according to Rule 9.1 for each program. Once the student completes all courses required in each program of study, the student receives a degree of that program. However, the study time must not exceed 8 academic years, counted from his/her first enrollment in the undergraduate study.

Rule 10: Add, drop, and withdrawal

A student can request to add, drop, and withdraw from courses provided the instructors approves and the request has to be approved by the Dean or a person appointed by the Dean. Approval is given according to the following criteria;

- 10.1 **Adding:** Request for adding the course must be done within the second week of a regular session, counted from the session's starting date or within the first week of summer session. For the courses that are not offered at the start of that session, adding can be requested in the first week of that course counted from the time the course starts.
- 10.2 **Dropping:** Dropped courses will not be shown in the transcript or grade report. The course will not be counted as having been registered once if dropping is done within the second week of a regular session, counted from the session's starting date or within the first week of the summer session. For the courses that are not offered at the start of that session, dropping can be requested in the first week of that course counted from the time when the course starts.
- 10.3 **Withdrawal:** Course withdrawal can be done after the second week of the regular session or after the first week of the summer session, or after the first week of the courses that do not start at the start of the session, until the week before the exams are



held. Courses that are withdrawn will be shown in the transcript and grade report, and the course is counted as registered once.

Reasons must be given for either approval or disapproval by the Dean or an appointed person.

Rule 11: Study time

The student has to be present in a theoretical, lecture, practice, internship, or field study no less than 80 percent of the total study time of that course in order to be allowed to take the exam.

Rule 12: Credits counting

12.1 Credits identified as “pass” will be counted in order to complete the program of study.

Only the credits for courses that have been given a “pass” grade are to be counted towards graduation. If the student has re-graded the course; only the credits of the course last registered for will be counted if evaluated as passed, and counted only once.

12.2 All scored credits will be counted to calculate the CUM-GPA.

If a student registers for the course more than once, only the latest score will be considered and used to calculate the CUM-GPA.

Rule 13: Calculating GPA

There are 2 types of GPA; GPA per session and CUM-GPA. GPA can be calculated as follows;

13.1 **GPA per session** is calculated from the grades in that session by dividing the sum of the products of the score and the number of credits by the total number of credits in that session. GPA is rounded off to two decimal places.

13.2 **CUM-GPA** is calculated from the first session of study to the last session by dividing the sum of all the products of the score and the number of credits by the total number of credits earned under Rule 12.2. CUM-GPA is rounded off to two decimal places.

If a student has registered for a course more than once, only the latest score is used.

Rule 14: Credits Transfer

A student who changes division or faculties within the university, or transfers from another institute is allowed to request credit transfer in order to acquire the total number of credits in the



program without having to register for those courses again. The transferred courses are shown as T in the transcript and grade report. The transfer of credits or courses can be done only for a student who has been approved to take such courses by the program committee or the person appointed by the faculty committee to be responsible for the program of study from which the transfer is to be made.

14.1 Credits transfer conditions

1. The standard quality of the institute from which the credits are transferred to Mahidol University must be comparable to that of Mahidol University's, and approval must be given by the program committee.
2. The course content must overlap with at least three quarters of the content of the corresponding course, or group of courses, in the university, and the courses must be approved by the program committee.
3. The transferred courses must have been registered for within the last 5 years, if not the decision is up to the program committee.
4. The transferred courses must receive at least Grade C or the equivalence.
5. Credits transfer can be made at most half of the total number of credits in that program.

14.2 In order to transfer the credits, the student has to write a letter to the Dean together with documents related to the course under consideration. Then the program committee and/or the faculty committee considers the request and gives reasons for approval. The matter is then presented to the university and/or the president for approval.

14.3 Grades of transferred courses are shown in the transcript and grade report as T and are not used to calculate the GPA or CUM-GPA.

14.4 Students with transferred courses according to Rules 14.1(1)-14.1(3) are able to receive a degree with honors complying with Rule 21.

14.5 Courses that do not follow the regulation, can still be transferred under the program committee and/or faculty committee with the university/president's approval in compliance with Rule 14.1

Rule 15: Leave of Absence

15.1 A student can request for leave of absence in the following situations;

1. Being conscripted or drafted for the army or military service.



2. Receiving grants to go abroad or on an exchange program under the university's approval.
3. Being sick or having health problems requiring more than 20 percent of class time in order to recover or to be cured as evidenced by a medical certificate endorsed by the Student Health Service of the university.
4. A student having personal reasons may ask for leave provided the student has been studying in the university for at least one session and has a CUM-GPA of at least 2.00.

Under Rule 15.1, the student has to request for leave as soon as possible to get approval from the Dean or the appointed person.

15.2 Under the force majeure, students' reasons may not come under Rule 15.1. The student must request for leave as soon as possible to get approval from the faculty committee or the person appointed by the faculty committee.

15.3 On the approval of leave of absence under Rules 15.1 and 15.2, the maximum time allowed is two regular semesters or 3 regular trimesters. If more time for leave of absence is needed, the student has to request for another leave of absence according to Rule 15.1 or 15.2.

15.4 During a leave of absence, study time is still counted: except in the case of 15.1(1) and 15.1(2) or other force majeure approved by the president.

15.5 During the leave, the student must maintain student status by paying fees according to university regulations; otherwise the student status will not be maintained.

15.6 If a student who has been approved leave wishes to return to study, the student has to request for re-admission to the Dean or the appointed person at least 1 week before the registration period.

Reasons must be given for approval or disapproval of leave of absence by the Dean or an appointed person.

Rule 16: Student Status Classification

16.1 Student status for a freshman is classified at the end of the second semester or trimester after entry. From sophomore onwards, classification is made at the end of each regular session or at the end of the academic year for the continuing program of study. For



students who request to graduate with a diploma or a bachelor's degree, classification may be done at the end of the summer session.

16.2 A student is classified normal or as under probation according to the following;

1. Normal status applies to students who are registered in the very first session or students who have CUM-GPA of at least 2.00.
2. Probation status applies to students who have CUM-GPA greater than or equal to 1.50 but less than 2.00, which can be further classified into 2 types.

Type 1 means a group of students who have Cum-GPA of 1.50 or higher but less than 1.80.

Type 2 means a group of students who have Cum-GPA of 1.80 or higher but less than 2.00.

Rule 17: Student's level

A student's level is classified from the total number of credits that the student has earned out of the total number of credits in the curriculum.

Rule 18: Student status will not be maintained according to the following conditions;

18.1 The student has completed the program of study according to the curriculum and has been approved to receive a diploma or a bachelor's degree under Rule 20.

18.2 The student has been approved from the Dean to be dismissed.

18.3 The president orders the student to be dismissed according to the following situations;

1. After classification, the student has CUM-GPA less than 1.50.
2. The student is under type 1 probation having CUM-GPA less than 1.80 and is still under probation in the next 2 semesters or the next 3 trimesters continuously or for one academic year by Rule 5.3.
3. The student is under type 2 probation having CUM-GPA less than 2.00 and is still under probation in the next 4 semesters or the next 6 trimesters continuously or 2 academic years by Rule 5.3.
4. The student registers in the same course at the maximum number of times stipulated in Rule 9.2(3) and still does not pass the course.
5. The student has used twice the time specified in the curriculum.



6. No registration or no leave of absence request has been made after the first two weeks of the session. The university cannot contact the student and the student has no appropriate reason to explain the situation.
7. The student acts against the university or joint institute regulations on students' discipline.
8. The student has difficulty with studying or working due to mental disorders. In this case, the university will appoint a committee to deliberate on the situation and make recommendations for the university council's approval.
9. The student is punished according to Rule 22.
10. Death.

Rule 19: Graduation

- 19.1 Graduation from full-time undergraduate study (4 years) can be made on or after the 6th regular semester.
- 19.2 Graduation from full-time undergraduate study (5 years) can be made on or after the 8th regular semester.
- 19.3 Graduation from full-time undergraduate study (not less than 6 years) can be made on or after the 10th regular semester.
- 19.4 Graduation for full-time undergraduate study (continuing) can be made on or after the 4th regular semester.

Rule 20: Granting Diploma or Bachelor's Degree

In order to be eligible to receive a Diploma or a Bachelor's Degree, a student has to;

- 20.1 Pass all courses and fulfill other criteria indicated in the curriculum.
- 20.2 Have CUM-GPA of at least 2.00
- 20.3 Have good behavior suitable for the prestige of the degree.

Rule 21: Degree with Honors

A student who has studied in an undergraduate program in the university with at least 120 credits including transferred courses, is eligible to receive a degree



with honors. However, transferred courses require at least Grade B (or equivalent) and are not used to calculate the CUM-GPA. In order to receive Class 1 honors, the student must have a CUM-GPA of 3.50 or above, while a Class 2 honors student must have a CUM-GPA of 3.25 or above, also a student must;

21.1 Not used time that exceeds that which is indicated in the curriculum.

21.2 Be eligible to receive a degree according to Rule 20.

21.3 Never have re-graded or re-registered in other courses or re-taken an exam or re-done a report or project in any course in the curriculum including the transferred courses.

21.4 If the student has transferred some credits, the sum of the transferred credits should not exceed one quarter of the total number of credits in the curriculum.

Rule 22: Dishonesty Punishments

Cheating during the exam is punished as follows;

22.1 Given F on the course in which cheating is committed.

22.2 Given F on the course in which cheating is committed, and be suspended in the next session for at least one session.

22.3 Given F to all courses registered in that session.

22.4 Given F to all courses registered in that session and be suspended in the next session for at least one session.

22.5 Be dismissed.

The president has the right to dismiss a student who has cheated in the exam, and that student cannot be re-admitted to study at Mahidol University.

Rule 23: Any act that is not included in this regulation, regulations of other universities or faculties that conforms to this regulation may be adopted.

Rule 24: The president is in charge of these regulations. In case of any problems concerning these regulations, the president has the power to make diagnostic interpretation and issue a command as he deems appropriate.



Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Announced on 27th April, 2009

(Professor Dr. Vicharn Panich, M.D.)

Chairman of Mahidol University Council



**Mahidol University Regulations
on Diploma and Undergraduate Studies (2nd Issue), B.E. 2556 (2013)**

Whereas it is deemed as appropriate to modify the Mahidol University Regulations on Diploma and Undergraduate Studies B.E. 2552 (2009).

Mahidol University Council, under Section 24 (2) of Mahidol University Act B.E.2550 (2007), agreed to enact the following regulations in its 478th meeting held on 20th November 2013.

1. These regulations are referred to as “Mahidol University Regulations on Diploma and Undergraduate Studies (2nd Issue), B.E. 2556 (2013).”

2. These regulations shall become effective after the promulgation date and henceforth.

3. The statement, hereby called Number 4 of Mahidol University Regulations on Diploma and Undergraduate Studies, 2009 shall be cancelled, and the following statement shall be applied.

“4. Each faculty committee shall consider admitting applicants into their programs in accordance with conditions and procedures stated in the curriculum or in the faculty announcements approved by the President of Mahidol University. The university shall determine the types of opening for undergraduate students which will be in the university announcement.”

4. The statement, hereby called Number 18.3 (6) of Mahidol University Regulations on Diploma and Undergraduate Studies, B.E. 2552 (2009) shall be cancelled, and the following statement shall be applied.

“18.3 The President shall expel a student in the following cases:

(6) within 2 weeks of registration, the student not registering for regular semester, not registering to retain student status, or not being approved for postponing the registration.

5. The following statement shall be added as Number 18/1 to Mahidol University Regulations on Diploma and Undergraduate Studies, B.E. 2552 (2009):

“18/1 Student status reinstatement

18/1.1 The student whose status ends due to Number 18.3 (6) may request reinstatement of student status by presenting the request form for reinstatement of student status to the President within 1 year after the expulsion.

18/1.2 Reinstatement of student status must be approved by the President following the consent of the Chairperson of the Program, the Dean, and Vice President for Education respectively.

18/1.3 After approval by the President, the student can earn student status and return to study regularly in the following semester.

18/1.4 The duration of the study absence will be included in the duration of the program’s maximum study period.

18.1.5 The student must pay the fee for the reinstatement of student status as well as the fees incurred during the period of the study absence.



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TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

18/1.6 After the return of student status is approved, the student will have his/her regular status as before. However, the computation of the study duration will be made according to Number 7.”

Announced on 16th December, 2013

(Professor Dr. Vicharn Panich)

Chairman of Mahidol University Council



Mahidol University Regulations
on Diploma and Undergraduate Studies (3rd Issue), B.E. 2558 (2015)

Whereas it is deemed as appropriate to modify Mahidol University Regulations on the Bachelor's Degrees and the Diploma/Certificate Program B.E. 2552 (2009) and the additionally modified (2nd Issue) B.E. 2556 (2013).

Mahidol University Council, under Section 24 (2) of Mahidol University Act B.E. 2550 (2007), agreed to enact the following regulations in its 495th meeting on 22nd April, 2015.

1. These regulations are referred to as “Mahidol University Regulations on Diploma and Undergraduate Studies (3rd Issue), B.E. 2558 (2015).”

2. These regulations shall become effective from the promulgation date and henceforth.

3. The following statement, hereby called Number 23/1, is to be added to Mahidol University Regulations on on Diploma and Undergraduate Studies, B.E. 2552 (2009) and additionally modified (2nd Issue) B.E. 2556 (2013).

“Number 23/1: The University Council has the authority to consider cases for exemptions of the regulations provided that the cases have gained approvals from no less than a quarter of the council members presented in the meeting.”

Announced on 20th May, 2015

(Professor Dr. Vicharn Panich)

Chairman of Mahidol University Council



Mahidol University Regulations on Diploma and Undergraduate Studies (Issue 4), 2015

Mahidol University Regulations on Diploma and Undergraduate Studies was under consideration for improvement, and thus Mahidol University Council, under Section 24(2) of Mahidol University Act B.E.2550 (2007), agreed to enact the following regulations in its 500th meeting on 16th September 2015.

1. These regulations are referred to as “Mahidol University Regulations on Diploma and Undergraduate Studies (Issue 4), 2015.”

2. These regulations shall be effective from academic year of 2015 and henceforth.

3. The definitions of a “faculty” and a “faculty committee” stated in number 3 of Mahidol University Regulations on Diploma and Undergraduate Studies 2009 shall be cancelled, and the following statements shall be applied:

A “working unit” refers to a faculty, a college, an institute, a graduate school, and other working units, called by other terms that are responsible for teaching and are an equivalent to a faculty; this includes a campus with a curriculum/curricular complying with the university’s regulations.

A “working unit committee” is a term that covers other working unit committees or working units that are called by other terms and are responsible for teaching.

4. The statement in number 8.4 of Mahidol University Regulations on Diploma and Undergraduate Studies 2009 shall be cancelled, and the following statements shall be applied:

“8.4 An “F” grade shall be given to students with the following circumstances:

(1) students who have attended the examination and/or failed the examination or failed in an evaluation of their work

(2) students who have missed the examination despite not being allowed to by the faculty committee or the person authorized by the faculty

(3) students who have not been allowed to take the examination as stated in number 11

(4) students who have violated examination rules, such as showing up later than the indicated time, not following the dress code, or having performed an action as stated in number 22 and therefore it has been decided to fail them in the examination

(5) students who have received an “I” and have not proceeded with the examination or the assigned work after receiving an “I” within one normal academic year of the semester or the trimester system, except for those who have been allowed to drop the semester as stated in numbers 15.1 and 15.2

(6) students who have received a “P” and have not taken the examination and/or submitted the assigned work

(7) students who have not taken the re-examination or have not re-submitted the assigned work as stated in number 8.3 (2); or students who have taken the re-examination or re-submitted the work but still have failed the evaluation

(8) students who lack the qualifications for the subject’s evaluation as stated by the “working unit committee”

5. The statement in number 22 of Mahidol University Regulations on Diploma and Undergraduate Studies 2009 shall be cancelled, and the following statements shall be applied:

“22. Students who have cheated in the subject’s examination shall get an “F” for that particular subject, and disciplinary actions shall be taken against each student according to the Mahidol University Regulations on Student Disciplines”.



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Faculty of Science

Department of Pathobiology

6. If the terms “faculty” and “the faculty committee” are used in the Mahidol University Regulations on Diploma and Undergraduate Studies 2009, they shall refer to a “working unit” and a “working unit committee” as stated in this announcement.

Announced on 15th October 2015

(Professor Dr. Vicharn Panich)

Chairman of Mahidol University Council



Mahidol University Regulations
on Diploma and Undergraduate Studies (Issue 5), 2016

Mahidol University Regulations on Undergraduate Studies were under consideration for improvement, and thus Mahidol University Council, under Section 24(2) of Mahidol University Act 2007, agreed to enact the following regulations in its 507th meeting on 20th April 2016.

1. These regulations are referred to as “Mahidol University Regulations on Diploma and Undergraduate Studies (Issue 5), 2016.”

2. These regulations shall be effective from the next day after the announcement.

3. The following statement shall be added as number 19/1 in the Mahidol University Regulations on Diploma and Undergraduate Studies 2009:

“19/1 English Proficiency Tests

Undergraduate students shall pass English proficiency test(s) according to the university’s conditions and regulations”

4. The following statement shall be added as number 20.4 in the Mahidol University Regulations on Diploma and Undergraduate Studies 2009:

“20.4 Students are able to pass the English proficiency test according to the university’s announcement.”

Announced on 30th May 2016

(Professor Dr. Vicharn Panich)

Chairman of Mahidol University Council



Mahidol University Regulations

on Diploma and Undergraduate Studies (Issue 6), 2017

Mahidol University Regulations for Diploma and Undergraduate Studies have been under consideration for improvement, and thus the Mahidol University Council, under section 24(2) of the Mahidol University Act of B.E. 2550 (2007), agreed to enact the following regulations in its 517th meeting on 15th February 2017.

1. These regulations are referred to as “Mahidol University Regulations for Diploma and Undergraduate Studies (Issue 6), 2017”.
2. These regulations shall be effective from the announcement date and henceforth.
3. Statement number 14 of the Mahidol University Regulations for Diploma and Undergraduate Studies 2009 shall be cancelled, and the following statements shall be applied:

“14 Credit Transfer

Students who wish to transfer credits from their subjects or their working units (within Mahidol University or from other higher education institutes) may request to transfer credits up to the number of credits that they are required to take to complete their program, without having to enrol in subjects in the program, and the results will be shown as “T”. The transfer can be made only after the students have obtained permission to do so, or for students who have been approved to enrol in subjects in other higher education institutes. Such conduct must be agreed by the lecturers responsible for the program, the working unit committee, or the program committee. The credit transfer must follow the following rules:

14.1 Conditions for credit transfer

- (1) The credit(s) to be transferred must be of subject(s) in other higher education institutes in Thailand or overseas with a higher or equivalent standard to Mahidol University, and they must have been approved by the program committee.
- (2) The credit(s) to be transferred must be of subject(s) that provide at least a three-quarter similarity or equivalent content and learning experiences to students compared to subjects in the program, and this must have been approved by the program committee.



(3) The credit(s) to be transferred must be from subject(s) which the student has been enrolled in within 5 years. If not, the program committee and the working unit committee will consider the matter.

(4) The grade(s) of the credited subject(s) to be transferred must be at least a C.

(5) Students can transfer no more than half of the total number of credits in the program.

14.2 Students who wish to transfer their credits must send evidence regarding those subjects and a letter to the working unit. The head of the working unit, agreed by the relevant department and program committee and/or the working unit committee, is responsible for the credit transfer consideration and will present their findings to the Mahidol University President for approval.

14.3 The transferred credit(s) will be shown in the student's transcript under the name of the subject(s) transferred, marked with "T", and their scores will not be included in the GPA.

14.4 Students who have their credit transferred as stated in number 14.1 (1) – (3) can still obtain a bachelor's degree according to the Mahidol University Regulations for Diploma and Undergraduate Studies.

14.5 Credit transfer can be done under student exchange and student mobility projects between Mahidol University and other higher education institutes in a program or in an MOU, as detailed below:

(1) Bilingual programs that cooperate with overseas higher education institutes – Students will graduate with two bachelor's degrees, one from Mahidol University and another from the overseas institute;

(2) Double or multiple degree programs that cooperate with overseas higher education institutes – Students will graduate with two bachelor's degrees, one from Mahidol University and another from the overseas institute that cooperates in teaching in the program;

(3) Joint degree programs which are programs that cooperate in teaching with overseas institutes – Students will graduate with one bachelor's degree;

(4) Distance education programs with reliable planning, teaching methods, teaching services, and quality assessments; or



(5) MOU between Mahidol University and overseas higher education institutes.

Concerning credit transfer in the cases of numbers 14.5 (1) - (5), students can obtain results for transferred credits as grades and they can be included in the GPA and be recorded on their transcripts. The head of the working unit, agreed by the relevant department and program committee and/or the working unit committee, is responsible for the matter consideration and present it to Mahidol University President for approval.

14.6 Any case of credit transfer other than those described in these regulations shall be considered by the head of the working unit, agreed upon by the relevant department and program committee and/or the working unit committee, and he or she will be responsible for presenting it to the Mahidol University President for approval.”

4. The credit transfer that has been made in MOU programs between Mahidol University and other overseas higher education institutes before the inauguration of these regulations shall follow number 14.5 in this announcement.

Announced on 1st March 2017

Prof. Emeritus Kasem Watanachai

Chairman of the Mahidol University Council



Mahidol University Regulations
on Diploma and Undergraduate Studies (Issue 7) 2017
(B.E. 2560)

Mahidol University Regulations on Diploma and Undergraduate Studies have been under consideration for improvement.

Thus, Mahidol University Council, under the Article 24 (2) of the Mahidol University Act B.E. 2550 (2007), agreed to enact the following regulations in its 525th meeting on October 18, 2017.

1. These regulations are referred to as “Mahidol University Regulations on Diploma and Undergraduate Studies (Issue 7) 2017 (B.E. 2560).”

2. These regulations shall be effective from the day after the announcement date and henceforth.

3. The statement in Clause 8.2 of Mahidol University Regulations on Diploma and Undergraduate Studies 2009 (B.E. 2552) shall be cancelled, and the following statements shall be applied:

“8.2 The symbols without grades

The outcome of the study for each course may be in the forms of certain symbols with the meaning as follows:

<u>Symbols</u>	<u>Meaning</u>
AU	Audit
O	Outstanding
S	Satisfactory
T	Transfer of Credit
U	Unsatisfactory
I	Incomplete
P	In progress
X	No report
W	Withdrawal”

4. The following clause shall be added as (3) of Clause 8.3 of Mahidol University Regulations on Diploma and Undergraduate Studies B.E. 2552 (2009):

“(3) The symbol O in each course signifies outstanding knowledge, ability, and skills or knowledge, ability, and skills that are above the normal criteria used for the assessment of each course.”

Announced on 28 November, 2017

Professor Emeritus Kraisit Tantisirin

Vice Chairman of Mahidol University Council

Acting Chairman of Mahidol University Council



**Mahidol University Regulation on Diploma and Undergraduate Studies (8th issue)
B.E. 2561**

Mahidol University Regulation on Diploma and Undergraduate Studies has been deemed appropriate for a revision.

As empowered by the virtue of the Article 24 (2) of the Mahidol University Act B.E. 2550, Mahidol University Council, in the 531st meeting on April 18, 2018, announced the following statements.

1. This regulation is referred to as “Mahidol University Regulation on Diploma and Undergraduate Studies (8th issue) B.E. 2561.”

2. This regulation shall be enforced on the announcement date and henceforth.

3. The following statements shall be added as Clause 4/1 in Mahidol University Regulation on Diploma and Undergraduate Studies B.E. 2552.

“4/1 All students shall be supervised by appointed advisors who facilitates their educational planning according to their study plan. The Head of each work unit shall appoint instructors in all programs as advisors for all students of all years as stated in the first paragraph.

The advisors should meet their advisees according to the program's requirements, and the advisors should set certain dates and time when their advisees can meet. All work units shall evaluate the advisors' work every semester. The advisors shall be responsible for the following.

4/1.1 Giving advice and help their advisees plan their study that complies with the program's requirements.

4/1.2 Giving advice about rules, regulations, and announcements in their study.

4/1.3 Giving advice about course registration, adding, dropping, and withdrawing and about their credits in each semester.

4/1.4 Giving advice about their studying and follow up on their study results.

4/1.5 Giving advice about how to process all matters in accordance with the University's rules and regulations.

4/1.6 Giving advice about their advisees' university life and education.

4/1.7 Making sure their advisees' behaviors are appropriate in accordance with the University's rules and regulations.

4/1.8 Reporting their consultation to the Head of the work unit every semester.

4/1.9 Being responsible for other assigned tasks.”

Announced on May 21, 2018

(Signature)

(Emeritus Professor Kraissid Tontisirin, MD., PhD)
Vice President of Mahidol University Council
and Acting President of Mahidol University Council



Mahidol University Announcement
on English Competence Standards for Undergraduate Students of Mahidol University 2017
(B.E. 2560)

Mahidol University agrees to set the English competence standards for undergraduate students of Mahidol University to be in accordance with the Announcement of the Office of Higher Education Commission Thailand on the Policy of the Improvement of the Standard of English Competency dated April 12, 2016, stating that institutions of higher education shall establish the policy and objectives to improve the standard of English ability in every program and every level of education of higher education institutions in order to serve as guideline for developing the English skills and abilities of undergraduate students and enable them to become graduates who have knowledge and abilities both in terms of academic, professional, and English communication skills, as well as to develop a plan to achieve the goals set in the policy, with the objectives and their indicators, as well as a clear system of evaluation.

As empowered by the virtue of the Article 19/1 of Mahidol University Regulations on Diploma and Undergraduate Studies (Issue 5) 2016 (B.E. 2559), in correspondence with the resolution of the 15/2017 meeting of Mahidol University Committee Board on 23 August, 2017, the President of Mahidol University issued This Announcement as follows:

1. The following announcements shall be cancelled

- (1) Mahidol University Announcement on English Competence Standards for Undergraduate Students of Mahidol University 2017 (B.E. 2560), dated September 7, 2017
- (2) Mahidol University Announcement on English Competence Standards for Undergraduate Students of Mahidol University 2017 (B.E. 2560), dated October 25, 2017

2. All undergraduate students of Mahidol University must meet the standard of English competency equivalent to the average English competency of students based on the Common European Framework of Reference for Languages (CEFR), and in accordance with the National Education Plan B.E. 2560-2574 issued by the Ministry of Education as follows:

- 2.1 an MU-ELT score of 84 and higher, or
- 2.2 a TOEIC score of 600 and higher, or



2.3 a TOEFL IBT score of 64 and higher, or

2.4 an IELTS score of 5.0 and higher

3. The MU-ELT test will be held by Mahidol University every semester.

4. Students can take an English competency test every semester prior to graduation and they have to submit the score according to Article number 2 of this announcement within two years after being accepted as an undergraduate student of Mahidol University, so that they can have opportunities to improve their English competency to meet the criteria set by the university before graduation.

5. The test fee for MU-ELT is 400 baht per test.

6. Undergraduate students must pass the criteria set for the English competency prior to their graduation. This is considered one of the requirements for the approval of an undergraduate degree as stated in Article number 20.4 of Mahidol University Regulations on Diploma and Undergraduate Studies (Issue 5) B.E 2559 (2016).

7. The President of Mahidol University is in position of authority over this Announcement. In case of any dispute, the judgment of the President shall be final.

This shall be effective for undergraduate students who enroll in Mahidol University from the academic year 2017 onwards.

Announced on 10 November, 2017

Prof. Banchong Mahaisavariya, M.D
Acting President of Mahidol University



Mahidol University

Disciplinary Measures 2010

To minimize constraints to study within the Mahidol University community, students are protected and bound by a set of social rules. These rules or codes of conduct provide a framework within which students' rights and freedoms can be exercised.

Mandated by Article 24 (2) of the Mahidol University Act, 2007, the 442nd meeting of Mahidol University Council on September 15, 2010 enacted the following measures.

1. These measures are hereby called the "Mahidol University Disciplinary Measures 2010".
2. These measures will be activated on the day of the announcement.
3. They override Mahidol University Disciplinary Measures 2004.
4. With regard to these measures,

"University" denotes Mahidol University.

"President" denotes President of Mahidol University.

"Department" denotes Faculty, College, Institute, Faculty of Graduate Studies, and also any provincial campus using the university curriculum.

"Chair" denotes Dean, Director of an institute, and also a Vice President who supervises a provincial campus under the university curriculum.

"Staff" denotes civil servants, employees, and university officials at Mahidol University who possess work permits.

"Student" denotes certificated, undergraduate and graduate students.

Chapter 1

Codes of Conduct

5. Students must maintain discipline and ethical values. They should abide by any university/department announcements and follow the measures outlined.

6. Students must uphold unity, peace, and the reputation of the university. They should not instigate or participate in any quarrels, physical assaults, or damage to university or the other property.



7. Students must behave themselves. They must abstain from behavior that could demean themselves, others, or the reputation of the university.

8. Students must listen to instructions and warnings from instructors and staff and act accordingly.

9. Students must dress appropriately. They must conform to the dress code of their department. Upon entering a class, an examination, or a department within the university, students must make their identification cards available in case any instructor or staff needs to see them.

10. Students must not drink alcohol or use drugs (or any prohibited substance) while they are in the university (including the provincial campuses) or while they are wearing their university uniform.

11. Students who engage in the following misconduct will be subject to serious disciplinary violation:

- (1) Gamble or take part in gambling businesses, or support thereof
- (2) Use, possess, or sell illegal drugs
- (3) Steal, extort, cheat, embezzle, threaten, force, or rob the other or engage in corruption for financial gain
- (4) Possess or carry weapons or toxic substances that may endanger the lives or properties of others
- (5) Perform immoral or inappropriate sexual or public behavior that could affect the reputation of the university
- (6) Quarrel or cause physical harm that ensues a severe injury or death or an adverse effect on the university's reputation
- (7) Commit a crime with the final court decision of imprisonment, except for mistakes made by carelessness
- (8) Intentionally cheat in an exam or make an effort to take part in an exam dishonestly
- (9) Produce, circulate, or possess media, publications, drawings, or writings or act in other ways to defile the other or the university
- (10) Forge a signature, fake a document, or change details in the original document, or file a document that has been adjusted to the university or the other entities that could result in damage to the university or the other
- (11) Willingly ruin university properties or those belonging to other
- (12) Act in a manner that the President determines as violating the codes of conduct

12. Students who carry out any of the misconducts listed above will be subject to disciplinary punishment. For minor misdemeanors, the departmental chair may omit punishment and instead give the student verbal warning.

13. There are six (6) main types of disciplinary punishment.

- (1) Verbal warnings
- (2) Written warnings
- (3) Dismissal from examination



- (4) Cancel, reconsider, or suspend the student's candidacy for a degree or a diploma**
- (5) Withdraw for study up to one academic year**
- (6) Dismiss the student from the university**

14. Students who are considered as not severely violating the codes of conduct will be on the condition of written promise to behave appropriately. Verbal warnings of misconduct will be administered in cases where the violation is minor or there is a good reason for applying a reduced form of punishment.

15. Students who severely violate the codes of conduct will be subject to dismissal from an examination, degree cancellation, degree reconsideration, suspension of degree, withdrawal for up to one academic year, or dismissal from the university.

16. The departmental chair has the right to make departmental announcements regarding disciplinary measures - as long as the announcements are consistent with, and supplementary to, these existing measures and that they notify the university of their announcements.

Chapter 2

Disciplinary Proceeding

17. For cases with sufficient evidence, investigations and disciplinary punishments will be conducted promptly and fairly.

18. The investigation of the accused student will be performed by the Jury Council as appointed by the President or the departmental chair. This step can be skipped for the cases already settled as follows:

- (1) The court makes a judgment on the case, resulting in imprisonment or heavier penalties, except for minor misdemeanors, such as those caused by carelessness.
- (2) The student who conducted a wrongdoing confessed in person or in writing to the departmental chair or the Jury Council and the confession was recorded in writing.

19. The Jury Council in item 18 consists of at least 3 people including a President, a Secretary, and Jury(s). An investigation is carried out as early as possible and within 60 days from the date of the Jury Council appointment. If the investigation cannot be finished within the time period, the Jury Council can submit to the authority who appointed them for a maximum extension of 30 days for each submission.

20. The Jury Council must notify the accused person of his or her charges with the available supportive evidence. The name(s) of the witness(es) may or may not be disclosed. This information will allow the accused person to bring to the jury his or her witness(es) and testimonies prior to judgment decision.

21. For minor cases, the departmental chair may give verbal warnings or in writing as they consider appropriate, then notify the university of the incident as soon as possible.



22. For severe cases, departmental chair will report the causes and investigation results to the President for a decision regarding punishment. Depending on severity of the case, they will then proceed to dismiss the student's right of taking an exam, cancel, reconsider, or suspend their degree, or withdraw the student for a maximum of one (1) academic year, or dismiss the student from the university. Withdrawal from the university that the President may order a departmental chair to carry out on his behalf shall be for a maximum of one (1) semester.

23. Disciplinary punishments must be carried out following a formal letter of order. The authority must also provide information about making an appeal and the length of time allowed for this. Depending on the case, once punishment is delivered, the student's parent or guardian, adviser, and the university will be notified.

Chapter 3

Appeal

24. If a student is subject to a disciplinary punishment and does not accept it, the student has the right to appeal according to the procedures outlined here. During the appeal process, the student will still be subject to punishment.

25. The student who makes an appeal must file a signed formal document. Each individual can only appeal for themselves. A student cannot make an appeal on behalf of another student.

26. To support an appeal, the student can ask to check or make a copy of the past investigation record. The record of witness investigations and other documents may or may not be disclosed depending on judgment of the departmental chair or the Jury Council.

27. The Appeal Committee comprises of 5 to 7 people, one of which must be a paralegal professional or a law graduate appointed by the President with a specified operation period.

28. The Appeal Committee will perform the following tasks;

- (1) Analyze the appealed matter;
- (2) Make a written request for additional documents or visits from a person involved in the case as considered necessary;
- (3) Appoint a person or a group of people to make a consideration or to operate on a duty within the committee scope; and
- (4) Carry out other responsibilities designated by the university.

29. An appeal must be made to the Appeal Committee within fifty (50) working days starting from the first day that the accused student knows or should know about his or her punishment.

30. An appeal must be made directly to the Appeal Committee. The Committee must finish working on a case within thirty (30) days beginning from the day of the appeal being filed. The length of time for a case consideration may be extended no longer than sixty (60) days from the last of the given thirty (30) days. Written reports and records of the appeal must be made.

31. The Appeal Committee may render the punishment either appropriate or unjust. The Committee will then make a proposal to the President to either immediately dismiss the appealed case, increase, or reduce the punishment. The first deliberation of the Appeal Committee is final. The Committee must immediately pass the deliberation onto the student who made the appeal.



Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

32. To count the exact number of days for these measures, if the end of the period takes place on the weekend, the next working day will be considered as the end.

34. The President acknowledges these measures. When any problem arises regarding compliance with these measures, the President has the power to order an action and his word is final.

Chapter 4

Provisional Clauses

35. Any disciplinary proceedings or appeals that took place prior to the enactment of these measures shall comply with Mahidol University Disciplinary Measures 2004.

36. Until new appointments are made, the appointed body for the Mahidol University Disciplinary Measures 2004 will continue to act in its duty and in compliance with the details in Mahidol University Disciplinary Measures 2010.

Announced on October 8, 2010

**Prof. Wijarn Panich, M.D.
Chairman of Mahidol University Council**



Faculty of Science, Mahidol University Announcement
Subject:
Undergraduate Education B.E. 2553 (2010)

Whereas it is deemed appropriate to define the criteria of undergraduate education to comply with the Mahidol University Regulation on Undergraduate and Diploma Education B.E. 2552 (2009).

Under the provisions of the Mahidol University Regulations on Diploma and Undergraduate Education B.E. 2552 (2009), the Dean of Faculty of Science, by the agreement of the Faculty Committee in its 4/2553 meeting on 7th April 2010, the criteria for undergraduate education has been stipulated as follows:

1. The following regulations and announcements shall be repealed:
 - 1.1 Faculty of Science, Mahidol University Regulations on Education Assessment B.E. 2543 (), Dated 12th May B.E. 2543 (2000)
 - 1.2 Faculty of Science, Mahidol University Regulations on Education Assessment (No. 2) B.E. 2545, Dated 9 January B.E. 2545 (2002)
 - 1.3 Faculty of Science, Mahidol University Announcement, Subject: Criteria and Procedures of Re-examination for Undergraduate Students B.E. 2547, Dated 20th May B.E. 2547 (2004)
 - 1.4 Faculty of Science, Mahidol University Announcement, Subject: Criteria and Procedures of Re-examination for Undergraduate Students B.E. 2547 (Addendum), Dated 15th March B.E. 2550 (2007)
2. In this announcement,
 - “Faculty” means the Faculty of Science, Mahidol University.
 - “Dean” means the Dean of Faculty of Science, Mahidol University
 - “Students” means the undergraduate students of Faculty of Science, Mahidol University, and students enrolled in the subjects provided by the Faculty of Science, Mahidol University.
3. First and Second Semesters are normal mandatory semesters, and students must register their subjects and credits as required by the Faculty of Science, which required at least 9 credits and no more than 23 credits for each normal semester.
4. For subjects with prerequisite(s), the students must be evaluated as “pass” in the prerequisite subjects(s) before they can register for the subject. Except when the requisite and the subject are offered in the same year.
5. Students cannot take 2 subjects which are offered at the same date and time.



6. To evaluate students in more detail, the (+) mark was employed, meaning there will be B+, C+, and D+. The required score and the meaning of the mark would follow the regulations stipulated by the university.

7. The A, B+, B, C+, C, D+, D, S, T, and AU are evaluated as “pass”, while F and U are evaluated as “not pass”.

8. In cases where the student has to be absent with a cause, the student must submit the examination rescheduling before the exam or within 3 days after the exam to the Educational Affair Division and the penalty of 30% score. Rescheduling without penalty require the consideration of the committee of no less than 3 persons which include the executive of the Educational Affair Division and lecturers of the department.

9. Summer is not a mandatory semester. The Faculty of Science will not offer classes during summer semester, EXCEPT for subjects in which the students received F grade in the first or second semester or have more than 15 accumulated students with the F grade. For subjects with less than 15 accumulated students, the respective department shall arrange a re-examination of the subject(s) during the summer semester, and no course(s) will be offered during the summer semester.

10. If other condition applies, the offer of summer subject(s) shall be considered by the Deputy Dean for Education.

11. Students eligible to register in summer semester include:

11.1 Students with the mark F in the subject offered during the summer semester or

11.2 Students with GPA lower than 2.00 or

11.3 Students approved by the department responsible for the subject offered.

Students must not have been evaluated as Dismissed or prone to being dismissed. In cases that the student has already registered for the subject, but the GPA fell into Dismissed classification, the registration shall be considered void.

12. Students eligible to register for the re-examination include students who had received the F mark in the subject(s) which are open for re-examination in the same year as the opened subject(s).

Students must not have been evaluated as Dismissed or prone to being dismissed. In cases that the student has already registered for the subject, but the GPA fell into Dismissed classification, the registration shall be considered void.

13. Classes in summer semester last for 6 weeks, with the final examination on the 7th week, and the evaluation completed in the 8th week. The maximum credits for the summer semester is 9 credits, and the subjects can be withdrawn within 4 weeks after the class started.

14. The re-examination of the subjects in either the first or the second semester will be held at least 4 weeks after the announcement of the second semester’s final results. This is to allow the students to prepare for the examination and submit the re-examination request. The latest grades of the students must also be submitted to the Educational Affair Division within 8 weeks after the announcement of the final examination results, and no re-examination is permitted beyond the given time.



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15. The re-examination grade can only be D or F. Except the re-examination of 2nd or 3rd year students of the Faculty of Medicine Ramathibodi Hospital, Bangkok Medical College and Vajira Hospital, Maharat Nakhon Ratchasima Hospital Medical Education Center, Sawanpracharak Hospital Medical Education Center, and Maharaj Nakhonsithammarat Hospital Medical Education Center, which the re-examination grade can be D+, D, or F.

16. The Dean of Faculty of Science shall ensure the announcement is followed. Should any problem arise following this announcement, the Dean of Faculty of Science shall rule, consider, and make decision as deemed appropriate.

The announcement shall be in effect from 1 June B.E. 2553 (2010).

Announcement made on 11 May B.E. 2553 (2010)

(Professor Skon Mongkolsuk)

Dean

Faculty of Science

Mahidol University



Degree ☒ Bachelor ☐ Master ☐ Doctoral

TQF 2 Bachelor of Science Program in Biomedical Science (International Program)

Faculty of Science

Department of Pathobiology

Appendix 8

Order of Curriculum Development Committee
or Curriculum Screening Procedure Committee or Person In-Charge



คำสั่งคณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล
ที่ ๙๖๓/ ๒๕๖๑
เรื่อง แต่งตั้งคณะกรรมการพัฒนาหลักสูตรระดับปริญญาตรี
สาขาวิชาวิทยาศาสตร์ชีวการแพทย์ (หลักสูตรนานาชาติ)
หลักสูตรปรับปรุง ปีการศึกษา ๒๕๖๒

เพื่อให้การดำเนินการพัฒนาหลักสูตรวิทยาศาสตรบัณฑิต สาขาวิชาวิทยาศาสตร์ชีวการแพทย์ (หลักสูตรนานาชาติ) หลักสูตรปรับปรุง ปีการศึกษา ๒๕๖๒ เป็นไปด้วยความเรียบร้อยและมีประสิทธิภาพ อาศัยอำนาจตามความในมาตรา ๓๗ แห่งพระราชบัญญัติมหาวิทยาลัยมหิดล พ.ศ.๒๕๕๐ คณะบดีจึงออกคำสั่งแต่งตั้งคณะกรรมการพัฒนาหลักสูตรวิทยาศาสตรบัณฑิต สาขาวิชาวิทยาศาสตร์ชีวการแพทย์ (หลักสูตรนานาชาติ) หลักสูตรปรับปรุง ปีการศึกษา ๒๕๖๒ ดังรายนามต่อไปนี้

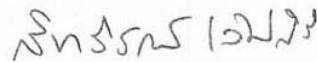
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| ๒. ดร.ทรงพล ดีจงกิจ | กรรมการผู้ทรงคุณวุฒิ |
| ๓. ดร.สิทธิรักษ์ รอยตระกูล | กรรมการผู้ทรงคุณวุฒิ |
| ๔. อาจารย์ ดร.สมยศ ศรีตรงฤทธิ์ | กรรมการ |
| ๕. อาจารย์ ดร.ธน เตชะเลิศไพศาล | กรรมการ |
| ๖. อาจารย์ นพ.สมพงษ์ นาคพินิจ | กรรมการ |
| ๗. อาจารย์ ดร.พรทิพา กอประเสริฐถาวร | กรรมการ |
| ๘. ผู้ช่วยศาสตราจารย์ ดร.ธนศ กังสมศรีศิลป์ | กรรมการและเลขานุการ |

หน้าที่

๑. ดำเนินการพัฒนาหลักสูตรให้แล้วเสร็จตามกำหนด โดยจัดทำรายละเอียดของหลักสูตร รายละเอียดของรายวิชา และรายละเอียดของประสบการณ์ภาคสนาม (ถ้ามี) ให้ชัดเจนตามกรอบมาตรฐานคุณวุฒิระดับอุดมศึกษาแห่งชาติและนโยบายของมหาวิทยาลัย
๒. กำหนดการประกันคุณภาพภายในของหลักสูตร เช่น กำหนดตัวบ่งชี้และเกณฑ์การประเมินผลการดำเนินงาน ฯลฯ
๓. ประสานงานกับงานการศึกษา และกองบริหารการศึกษา เพื่อขอความเห็นชอบจากคณะกรรมการที่เกี่ยวข้อง ตามขั้นตอนการพิจารณาหลักสูตร

ทั้งนี้ ตั้งแต่บัดนี้เป็นต้นไป โดยสิ้นสุดภาระหน้าที่เมื่อสภามหาวิทยาลัยอนุมัติการพัฒนาหลักสูตร

สั่ง ณ วันที่ ๑๙ พฤศจิกายน พ.ศ. ๒๕๖๑



(รองศาสตราจารย์ ดร.สิทธิวัฒน์ เลิศศิริ)
คณบดีคณะวิทยาศาสตร์



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Faculty of Science

Department of Pathobiology



คำสั่งคณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล

ที่ ๔๘๓ / ๒๕๖๑

เรื่อง แต่งตั้งคณะกรรมการพิจารณากันกรองหลักสูตรวิทยาศาสตร์บัณฑิต

ด้วยมีกรรมการบางท่านแจ้งความประสงค์ขอลาออกจากการเป็นคณะกรรมการพิจารณากันกรองหลักสูตรวิทยาศาสตร์บัณฑิต อาศัยอำนาจตามความในมาตรา ๓๗ แห่งพระราชบัญญัติมหาวิทยาลัยมหิดล พ.ศ. ๒๕๕๐ คณะบดีจึงยกเลิกคำสั่งคณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล ที่ ๖๖๔/๒๕๖๑ ลงวันที่ ๒๙ สิงหาคม พ.ศ. ๒๕๖๑ เรื่อง แต่งตั้งคณะกรรมการพิจารณากันกรองหลักสูตรวิทยาศาสตร์บัณฑิต และให้แต่งตั้งคณะกรรมการพิจารณากันกรองหลักสูตรวิทยาศาสตร์บัณฑิต ดังรายนามต่อไปนี้

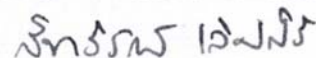
๑. ศาสตราจารย์ ดร.สุมาลี ตั้งประจักษ์กุล	ที่ปรึกษา
๒. รองคณบดีฝ่ายการศึกษาและพัฒนาคุณภาพ	ประธานกรรมการ
๓. รองคณบดีฝ่ายแพทยศาสตร์และบัณฑิตศึกษา	รองประธานกรรมการ
๔. รองคณบดีฝ่ายบริการการศึกษา ศาลายา	รองประธานกรรมการ
๕. ผู้ช่วยคณบดีฝ่ายการศึกษา	รองประธานกรรมการ
๖. รองศาสตราจารย์ ดร.กิตติศักดิ์ หยกทองวัฒนา	กรรมการ
๗. ผู้ช่วยศาสตราจารย์ ดร.ขวัญ อารยะธนิกุล	กรรมการ
๘. ผู้ช่วยศาสตราจารย์ ดร.ไพโรจน์ สติระคุ	กรรมการ
๙. ผู้ช่วยศาสตราจารย์ ดร.มันทนา จริยาบุรณ์	กรรมการ
๑๐. ผู้ช่วยศาสตราจารย์ ดร.ศศิวิมล แสงผล	กรรมการ
๑๑. ผู้ช่วยศาสตราจารย์ ดร.สุพิชา คุ่มเกตุ	กรรมการ
๑๒. หัวหน้างานการศึกษา	กรรมการ
๑๓. นางสาวสายพิน ทองพัด	กรรมการและเลขานุการ
๑๔. นางสาวเมธวี กาจุลศรี	กรรมการและผู้ช่วยเลขานุการ

อำนาจหน้าที่

๑. พิจารณากันกรองหลักสูตร ให้ความเห็น และข้อเสนอแนะเกี่ยวกับหลักสูตรที่เสนอเปิดใหม่ และหลักสูตรปรับปรุง ในระดับปริญญาตรี คณะวิทยาศาสตร์ รวมถึงตรวจสอบและกำกับคุณภาพของหลักสูตรให้เป็นไปตามเกณฑ์มาตรฐานหลักสูตรระดับปริญญาตรี พ.ศ. ๒๕๕๘ และสอดคล้องกับนโยบายของมหาวิทยาลัย
๒. ปฏิบัติหน้าที่อื่นตามที่ได้รับมอบหมายจากคณบดีคณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล

ทั้งนี้ ตั้งแต่บัดนี้เป็นต้นไป

สั่ง ณ วันที่ ๑๘ ธันวาคม พ.ศ. ๒๕๖๑



(รองศาสตราจารย์ ดร.สิทธิวัฒน์ เลิศศิริ)

คณบดีคณะวิทยาศาสตร์



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Appendix 9

9.1 MOU Made between the University of Sussex and Mahidol University



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Department of Pathobiology



MEMORANDUM OF UNDERSTANDING

between

UNIVERSITY OF SUSSEX

and

MAHIDOL UNIVERSITY

The University of Sussex and Mahidol University wishing to promote co-operation between the two institutions in education and in academic research, agree to explore:

- a. co-operation on academic programmes;
- b. the development of joint research activities;
- c. facilitate, university staff exchanges or mutual visits to both institutions;
- d. postgraduate student training and development;
- e. student exchange and/or visiting programmes;
- f. the exchange of information, including the results of teaching and research collaboration;
- g. any other activities viewed to be mutually beneficial.

The terms of co-operation for each specific activity implemented under this Memorandum of Understanding (MoU) shall be mutually discussed and agreed upon in writing by both parties prior to the initiation of that activity and will be the subject of separate agreements.

This MoU becomes effective from the day the representatives of both institutions affix their signatures below, and will continue for an initial period of five years, whereupon it shall be reviewed and may be extended by the mutual written agreement of both institutions. This MoU may be revised through the mutual agreement of both institutions and may be terminated by either party upon giving six months' written notice signed by the presiding officer of the notifying party.

Any use of the names 'University of Sussex' or 'Mahidol University', including any of its constituent schools, departments, programmes or logos, relating in any way to the activities described in this MoU, shall be subject to prior written approval.



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Department of Pathobiology

In witness to this agreement, the following individuals append their signatures:

For the University of Sussex

For Mahidol University

Stephen Shute

B. Mahini

Prof. Stephen Shute
Pro-Vice-Chancellor (Planning and Resources)

Prof. Banchong Mahaisavariya
Acting President of Mahidol University

Date: 29.01.19

Date: 25 FEB 2019

S. Guthrie

Sittawat Lertsiri

Prof. Sarah Guthrie
Head of School Life Sciences

Prof. Sittawat Lertsiri
Dean of Science Faculty

Date: 28.01.19

Date: - 7 FEB 2019



9.2 Articulation Agreement between the School of Life Science, the University of Sussex and the Faculty of Science, Mahidol University

Table in Appendix 9.2

Equivalent Course Mapping between Topics at the University of Sussex and Courses at Mahidol University

Academic Year	Topics at the University of Sussex (credits)	Equivalent Courses at Mahidol University (credits)
3	<u>Autumn</u> C7108 Cell Regulation and Cancer (15)	SCBM 340 Basic Cellular Pathology (2)
	C7110 Genetics and Genomics (15)	SCBM 373 Bioinformatics (2) SCBM 374 Gene Technology (1)
	C7114 Structural Basis of Biological Function (15)	SCBM 321 Medical Genetics (2)
	C7138 Haematology and Anatomy (15)	SCBM 312 Medical Neuroscience (3)
	<u>Spring</u> C7020 Clinical Biochemistry (15)	SCBM 351 Principal Actions of Therapeutic Agents (1) SCBM 352 Pharmacology 1 (2) SCBM 353 Pharmacology 2 (2)
	C7102 Virology (15)	SCBM 375 Microscopy and Bioimaging (2) SCBM 376 Cell Culture Techniques (2) SCBM 377 Use of Experimental Animals for Scientific Research (1)
	C7137 Medical Microbiology (15)	SCBM 341 General Pathology (2)
	C7140 Combating Disease (15)	SCBM 347 Systemic Pathology (3)
4	<u>Autumn</u> C7127 Life Sciences Year 3 Research Project (Experimental) (30) C7162 Life Sciences Year 3 Research Project (Literature) (30)	SCBM 371 Generic Skills in Science Research (1) SCBM 372 Laboratory Exploration (1) SCBM 490 Scientific Research Planning (4) SCBM 491 Seminar in Biomedical Science 1 (1) SCBM 492 Seminar in Biomedical Science 2 (1) SCBM 496 Scientific Writing (2) SCBM 499 Senior Project (6)
	C1120 Neuronal Transduction and Transmission (15)	<u>Module A: Neuroscience</u> SCAN 311 Cellular and Molecular Neuroscience (3)
	C7118 Cell Signaling and its Applications in Therapeutics and Disease (15)	SCAN 312 Techniques in Neuroscience Research (3) SCAN 411 Neurodegeneration and Neuroregeneration (2)
	C7121 Immunology in Health and Disease (15)	SCAN 412 Innovation in Clinical Neuroscience (2)


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Academic Year	Topics at University of Sussex (credits)	Equivalent Courses at Mahidol University (credits)
4	C7123 Molecular Genetics (15)	<u>Module B:</u> Cell and Molecular Medicine
	C7132 Regulating the Transcriptome (15)	SCBC 321 Molecular Aspects of Human Diseases (3)
	<u>Spring</u>	SCBC 322 Laboratory Rotation in Cell and Molecular Medicine (3)
	C1121 Neuronal Plasticity and Gene Regulation (15)	SCBC 421 Frontiers in Molecular Bioscience (2)
	C7117 Innovation in Bioscience and Medicine (15)	SCBC 422 Innovation in Translational Biomedicine (2)
	C7120 Genomics and Bioinformatics (15)	<u>Module C:</u> Medical Microbiology
	C7124 Protein Form and Function (15)	SCMI 331 Medical Bacteriology (2)
	C7128 Molecular Pharmacology (15)	SCMI 332 Medical Mycology and Parasitology (2)
	C7129 Genome Stability, Genetic Diseases and Cancer (15)	SCMI 333 Medical Virology (2)
	C7131 Post Transcriptional Control of Gene Expression (15)	SCMI 431 Human Immune System in Health and Diseases (1)
	C7143 Structure and Function in the Brain (15)	SCMI 432 Current Research in Infectious Diseases (1)
	C7163 Advanced Human Virology and Bacteriology (15)	SCPA 441 Diagnosis and Control of Infectious Diseases (2)
	861C1 Advanced Haematology and Transfusion Science (15)	<u>Module D:</u> Novel Therapeutic Strategies and Diagnosis
		SCPA 341 Cancer Biology and Novel Biomarkers (2)