หลักสูตรวิทยาศาสตรมหาบัณฑิต
สาขาวิชาสรีรวิทยา
(หลักสูตรนานาชาติ/หลักสูตรปรับปรุง พ.ศ. ๒๕๖๖)

MASTER OF SCIENCE PROGRAM
IN
PHYSIOLOGY
(INTERNATIONAL PROGRAM/REVISED PROGRAM A.D. 2023)

FACULTY OF SCIENCE

AND

FACULTY OF GRADUATE STUDIES

MAHIDOL UNIVERSITY

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Master of Science Program in Physiology
(International Program)
Revised Program in 2023

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

Section 1 General Information

1. **Curriculum Name**
   - **Thai** หลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาวิชาสรีรวิทยา (หลักสูตรนานาชาติ)
   - **English** Master of Science Program in Physiology (International Program)

2. **Name of Degree and Major**
   - **Full Title** Thai: วิทยาศาสตรมหาบัณฑิต (สรีรวิทยา)
   - **Abbreviation** Thai: วท.ม. (สรีรวิทยา)
   - **Full Title** English: Master of Science (Physiology)
   - **Abbreviation** English: M.Sc. (Physiology)

3. **Major Subjects (if any)** -

4. **Required Credits:** not less than 36 credits

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

6. **Curriculum Status and Curriculum Approval**
   - 6.1 Revised Program in 2023
   - 6.2 Starting from semester 1, academic year 2023
   - 6.3 Curriculum screening committee approved the program in its meeting 17/2022 on 17 May, 2022
   - 6.4 The Mahidol University Council approved the program in its meeting on 586 on November 16, 2022

7. Readiness to Implement/Promote the Curriculum

The curriculum from the program is readily implemented and promoted its quality and standard according to criteria set by Thai Qualification Framework for Higher Education in academic year 2025 (two years after implementation).

8. Career Opportunities for Graduates

8.1 Researcher in physiology and related fields in academic/ drug/ food/ research institutes

8.2 Research specialist or consultant in drug, food and medical device companies

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

No.	Identification Card Number Academic position - Name – Surname	Degree (Field of Study) University: Year of graduate	Department
1.	x xxxx xxxxx xx x Professor Dr. Jonggonnee Wattanapermpool	Ph.D. (Physiology and Biophysics) University of Illinois at Chicago, USA: 1994 M.Sc. (Physiology) Mahidol University: 1985 B.Sc. (Radiological Technology) Mahidol University: 1983	Department of Physiology
2.	x xxxx xxxxx xx x Associate Professor Dr. Sunhapas Soodvilai	Ph.D. (Physiology) Mahidol University: 2005 B.Pharm (Pharmacy) Ubon Ratchathani University : 2000	Department of Physiology
3.	x xxxx xxxxx xx x Assistant Professor Dr. Witchuda Saengsawang	Ph.D. (Physiology and Biophysics) University of Illinois at Chicago, USA: 2008 B.Pharm (Pharmacy) Mahidol University: 2002	Department of Physiology

10. Venue for Instruction

Department of Physiology, Faculty of Science, Mahidol University

11. External Factors to Be Considered in Curriculum Planning

11.1 Economic Situation/Development

In formulating the curriculum, the Department of Physiology adhered to the Sustainable Development Goals (SDGs), which are a collection of interlinked global goals designed to be a "blue print to achieve a better and more sustainable future for all". Especially, SDG3 which is "to ensure healthy lives and promote well-being for all ages" is to be our strength to achieve an effective, beneficial and well-balanced program to meet the future challenges. Physiology is a required fundamental knowledge for all health care professionals as well as health related businesses. Therefore, our program aims to produce graduates with knowledge and skills in physiology and related fields, and who can further apply their knowledge to produce research and/or innovation to promote health and well-being in support of economic and social development.

11.2 Social and Cultural Situation/Development

The current situation of Thailand and ASEAN countries has changed from rural to urban society which affects lifestyle that unfortunately led to increased prevalence of non-communicable diseases, i.e., diabetes, hypertension, obesity, etc. Moreover, Thai society is becoming an aging society and there is a high probability that Thailand will have to bear an increasing cost of healthcare. Understanding human physiology is essential for development of preventive strategies and treatments for such diseases. Therefore, the program was designed to produce graduates that have basic knowledge in physiology, the fundamental functioning of living systems, and who can effectively disseminate such knowledge to the public and be an important workforce for our social development.

12. The Effects Mentioned in No. 11. 1 and 11. 2 on Curriculum Development and Relevance to the Missions of the University/Institution

12.1 Curriculum Development

External factors mentioned in 11.1 and 11.2. were taken into consideration during the formulation of the expected learning outcomes (ELOs) of M.Sc. program in Physiology. In addition, our ELOs are also formulated following the guidelines of the Thailand National Qualifications Framework, focusing on the learning areas including 1) ethics, 2) knowledge, 3) intellectual development, 4) interpersonal relationship and responsibility, and 5) mathematical analytical thinking, communication skills, and Information Technology skills. Moreover, 21st century skills are implemented in our courses.

12.2 Relevance to the Missions of the University/Institution

The ELOs of M.Sc. programs in Physiology were also designed according to the vision and mission of Mahidol University, Faculty of Science.

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

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

SCID 500	Cell and Molecular Biolog	3 (3-0-6)
SCID 507	Microscopic Technique	1 (0-2-1)
SCID 509	Separation Techniques	1 (0-2-1)
SCID 513	Animal Cell Culture Techniques	1 (0-2-1)
SCID 514	Animal Experimentation in Biomedical Research	1 (0-2-1)

13.2 Course(s) offered to other programs: None

13.3 Coordination:

The Program director coordinates with course coordinators regarding schedule, teaching/learning activities, and evaluation. Course syllabus is provided to students before class. Student progress is monitored throughout the course by program director and course coordinators.

Section 2 Information of the Curriculum

1. Philosophy, Justification, and Objectives of the Curriculum

1.1 Philosophy and Justification of the Curriculum

The educational philosophy of Mahidol University is " Do unto others as you would have others do unto you" which means that, aside from achieving academic excellence, graduates have a solemn duty to improve the quality of life for all humanity.

The primary focus of the program is on enabling graduate students to attain academic achievement through learner- centered education, outcome- based education and constructivism. Graduates are knowledgeable in physiology based on international standards and will be able to make significant contributions to improving the health and well-being of the people of Thailand.

1.2 Objectives of the Program

Upon completing the program, graduates should meet the standard for Thai Qualifications Framework for Higher Education which include:

1.2.1 Have professional ethics and moral

1.2.2 Understand theoretical and practical aspects of physiology

1.2.3 Apply knowledge in physiology that lead to publications and/or innovation

1.2.4 Demonstrate responsibility, leadership, and ability to work with others

1.2.5 Apply mathematical analysis and information technology for effective communication to the public

1.3 Program Learning Outcomes (PLOs)

Upon completing the program, graduates should be able to:

1.3.1 Demonstrate ethics professional ethics and moral

1.3.2 Evaluate physiological concepts for knowledge transfer/innovation and problem solving

1.3.3 Apply research skills in physiology or related fields to produce publications/innovation

1.3.4 Demonstrate responsibility, leadership, and ability to work with others

1.3.5 Transfer/disseminate knowledge by using various means of communications

2. Plan for Development and Improvement

Plan for Development/Revision	Strategies	Evidences/Indexes
1. The curriculum is to be revised every five years based on the policy of the Thai Commission of Higher Education	1.1. Survey for stakeholder satisfaction among alumni, employers and faculty members 1.2. Evaluation of courses and curriculum by current students 1.3. Monthly program committee meeting	1.1. Annual satisfactory evaluation report (once a year) 1.2. Annual stakeholder survey report (once a year) 1.3. Monthly program committee meeting report
2. To ensure the quality of teaching and learning	2.1 Monitor and evaluate the teaching technique of new instructors by experienced instructor appointed by the Program 2.2 Survey needs of training in interactive teaching and learning 2.3 Provide constructive feedback and training for instructors to improve interactive teaching and learning	2.1 Scores showing satisfaction on teachings and learning evaluation scale (> 3.5 in 1-5 scale) 2.2 Documents of training need survey (once a year) 2.3 Training certificates and/or a summary of new teaching/ evaluation technique

Section 3 Educational Management System, Curriculum Implementation, and Structure

1. Educational Management System

1.1 System: Two semester credit system. One academic year consists of two regular semesters, each with not less than 15 weeks of study.

1.2 Summer Session: None

1.3 Credit Equivalence to Semester System: None

2. Curriculum Implementation

2.1 Teaching Schedule Weekdays

In general, the offered courses are scheduled during normal working hours (08:30 a.m. – 04:30 p.m.) on weekdays (Monday – Friday). However, extra teaching and learning activities outside the normal working hours may be organized with appropriate management.

Semester 1 August – December

Semester 2 January – May

2.2 Qualifications of Prospective Students

2.2.1 Plan A1 (Research only)

1) Holding a Bachelor's degree in Biomedical Science, Medicine, Medical Technology, Nursing, Nutrition, Biology, Pharmacy, Physical Therapy, Sports Science, Veterinary Medicine and Science-related degrees which are accredited by the Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation.

2) Having a cumulative GPA of not less than 3.00

3) Having completed a physiology course (minimum 3 credits) with at least a B grade.

4) Having attained an English Proficiency Examination score as required by the Faculty of Graduate Studies

5) Having research experiences in Biomedical Science or related field

6) Applicants who do not meet the requirements indicated in 2) – 4) may be considered by the Program committee and the Dean of the Faculty of Graduate Studies

2.2.2 Plan A2 (Course work and Research)

1) Holding a Bachelor's degree in Biomedical Science, Medicine, Medical Technology, Nursing, Nutrition, Biology, Pharmacy, Physical Therapy, Sports Science,

Veterinary Medicine and Science-related degrees which is accredited by the Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation

2) Having a cumulative GPA of not less than 2.50

3) Having attained an English Proficiency Examination score as required by the Faculty of Graduate Studies

4) Applicants who do not meet the requirements indicated in 2) – 3) may be considered by the Program committee and the Dean of the Faculty of Graduate Studies

2.3 Problems Encountered by New Students

2.3.1 Different academic qualification from program announcement

2.3.2 Inadequate English proficiency

2.4 Strategies for Problem Solving/Limited Requirment in No. 2.3

Problems of New Students	Strategies for Problem Solving
1. Students enrolled in the program have bachelor's degree in different field.	1. The curriculum offers courses for students to obtain the basic knowledge required for the program. Plan A1 students are required to audit the course SCID500 before the start of the first semester and course SCID518 during the first semester. They are also required to pass the comprehensive examination within the first semester of the first year.
2. Students have English language issues in writing and communication.	2. Advisory system is designed to support each student. The advisor will encourage students to take additional English courses as necessary.

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

Plan A1 (Research only)

Academic Year	2023	2024	2025	2026	2027
1st	5	5	5	5	5
2nd	-	5	5	5	5
Cumulative numbers	5	10	10	10	10
Expected number of students graduated	-	5	5	5	5

Plan A2 (Coursework and Research)

Academic Year	2023	2024	2025	2026	2027
1st	5	5	5	5	5
2nd	-	5	5	5	5
Cumulative numbers	5	10	10	10	10
Expected number of students graduated	-	5	5	5	5

2.6 Budget based on the plan

Budget: Budget for the Master Program in Physiology, Faculty of Science, Mahidol University.

Estimated income per student	**Baht**
Plan A1 (Research only)	
Registration fee	
Tuition (0 Credits)	-
Thesis (36 Credits)	xx,xxx
Thesis research fee	xxx,xxx
Research supplies fee	xx,xxx
Total income per student	**xxx,xxx**
Estimated expenses	
Variable expenses per student	
College/university allocation	-
Position allowance for thesis advisor and committee	xx,xxx
Total variable expenses per student	**xx,xxx**
Fixed expenses	
Program director payment	-
Program secretary payment	-
Staff salary	-
Teaching payment	
Utility fee	-
Material fee	xxx,xxx
Equipment fee	xxx,xxx
Management fee	xxx,xxx
Total fixed expenses	**xxx,xxx**
Number of students at break-even point	**2 persons**
Cost of students at break-even point	**xxx,xxx**
Expenses per student per academic year (2 year)	**114,500**

Estimated income per student	**Baht**
Plan A2 (Coursework and Research)	
Registration fee	
Tuition (24 Credits)	xxx,xxx
Thesis (12 Credits)	xx,xxx
Thesis research fee	xxx,xxx
Research supplies fee	xx,xxx
Total income per student	**xxx,xxx**
Estimated expenses	
Variable expenses per student	
College/university allocation	xx,xxx
Position allowance for thesis advisor and committee	xx,xxx
Total variable expenses per student	**xx,xxx**
Fixed expenses	
Program director payment	-
Program secretary payment	-
Staff salary	-
Teaching payment	xxx,xxx
Utility fee	-
Material fee	xxx,xxx
Equipment fee	xxx,xxx
Management fee	xxx,xxx
Total fixed expenses	**xxx,xxx**
Number of students at break-even point	**3 persons**
Cost of students at break-even point	**x,xxx,xxx**
Expenses per student per academic year (2 year)	**180,600**

2.5 Educational System: Hybrid Educational System

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

Credits transfer must be in compliance with Mahidol University's regulations on Graduate Studies.

3. Curriculum and Instructors

3.1 Curriculum

3.1.1 Number of credits (not less than) 36 credits

3.1.2 Curriculum Structure

The curriculum structure is set in compliance with the Announcement of the Ministry of Education on the subject of Criteria and Standards of Graduate Studies A.D. 2015, Master Degree, Plan A1 and Plan A2 as below:

Plan A1 (Research only)

1)	Thesis	36 credits
	Thesis not less than	**36 credits**

Note

1) A student may register for other courses in an international program offered by other faculties equivalent to Graduate Studies, Mahidol University, or the ones offered by other universities according to the recommendation from advisor or curriculum committee.
2) Students must pass the comprehensive exam in physiology by the end of the first semester of the first year**.**
3) Students must submit their thesis and pass oral thesis defense examination evaluated by the committees that are appointed by the Faculty of Graduate Studies, Mahidol University. In addition, student's oral thesis defense is open for interested people to attend.

Plan A2 (Coursework and Research)

2)	Required courses	13 credits
3)	Elective courses not less than	11 credits
4)	Thesis	12 credits
	Total not less than	**36 credits**

Note

1) Students must submit their thesis and pass oral thesis defense examination evaluated by the committees that are appointed by the Faculty of Graduate Studies, Mahidol University. In addition, student's oral thesis defense is open for interested people to attend.

3.1.3 Courses in the curriculum

Plan A1 (Research only)

SCPS	798	Thesis	36(0-108-0)
วทสร	๗๙๘	วิทยานิพนธ์	

Plan A2 (Coursework and Research)

2) Required Courses 13 credits

		Credits (lecture – practice – self-study)
SCID 518	Generic Skills in Science Research	1(1-0-2)
วทคร ๕๑๘	ทักษะทั่วไปในการวิจัยทางวิทยาศาสตร์	
SCPS 606	Physiology Seminar I	1(1-0-2)
วทสร ๖๐๖	สัมมนาสรีรวิทยา ๑	
SCPS 607	Physiology Seminar II	1(1-0-2)
วทสร ๖๐๗	สัมมนาสรีรวิทยา ๒	
SCPS 609	Scientific Paper Analysis and Writing	1(1-0-2)
วทสร ๖๐๙	การวิเคราะห์และการเขียนบทความทางวิทยาศาสตร์	
SCPS 680	Systems Physiology I	3(3-0-6)
วทสร ๖๘๐	สรีรวิทยาเชิงระบบ ๑	
SCPS 681	Systems Physiology II	3(3-0-6)
วทสร ๖๘๑	สรีรวิทยาเชิงระบบ ๒	
SCPS 682	Professional Communication Skills	1(1-0-2)
วทสร ๖๘๒	ทักษะการสื่อสารอย่างมืออาชีพ	
*SCPS 691	Biostatistics for Physiology and Biomedical Research	2(2-0-4)
วทสร ๖๙๑	ชีวสถิติสำหรับสรีรวิทยาและการวิจัยวิทยาศาสตร์การแพทย์	

3) Elective Courses 11 credits

		Credits (lecture – practice – self-study)
SCID 500	Cell and Molecular Biology	3(3-0-6)
วทคร ๕๐๐	ชีววิทยาระดับเซลล์และโมเลกุล	
SCID 507	Microscopic Technique	1(0-2-1)
วทคร ๕๐๗	เทคนิคการใช้กล้องจุลทรรศน์	
SCID 509	Separation Techniques	1(0-2-1)
วทคร ๕๐๙	เทคนิคการแยกสาร	
SCID 513	Animal Cell Culture Techniques	1(0-2-1)
วทคร ๕๑๓	เทคนิคการเพาะเลี้ยงเซลล์สัตว์	

		Credits (lecture – practice – self-study)
SCID 514	Animal Experimentation in Biomedical Research	1(0-2-1)
วทคร ๕๑๔	การใช้สัตว์ทดลองในงานวิจัยทางชีวการแพทย์	
*SCPS 669	Clinical Exercise Physiology	2(2-0-4)
วทสร ๖๖๙	สรีรวิทยาการออกกำลังกายทางคลินิก	
*SCPS 675	Molecular Exercise Physiology	2(2-0-4)
วทสร ๖๗๕	สรีรวิทยาการออกกำลังกายระดับโมเลกุล	
*SCPS 684	Functional Anatomy and Kinesiology	2(2-0-4)
วทสร ๖๘๔	กายวิภาคศาสตร์และวิทยาศาสตร์การเคลื่อนไหว	
*SCPS 685	Nutrition for Health and Sport	2(2-0-4)
วทสร ๖๘๕	โภชนาการสำหรับสุขภาพและการกีฬา	
*SCPS 688	Current Topics in Exercise Science	2(2-0-4)
วทสร ๖๘๘	หัวข้อปัจจุบันทางวิทยาศาสตร์การออกกำลังกาย	
*SCPS 692	Fundamental Biomedical Innovation	1(1-0-2)
วทสร ๖๙๒	นวัตกรรมชีวการแพทย์พื้นฐาน	
*SCPS 693	Technology Entrepreneurship	1(0-2-1)
วทสร ๖๙๓	ผู้ประกอบการธุรกิจเทคโนโลยี	
*SCPS 694	Development of Drugs and Nutraceutical Products	2(2-0-4)
วทสร ๖๙๔	การพัฒนายาและโภชนเภสัชภัณฑ์	

* New courses

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

4) Thesis 12 Credits

SCPS	698	Thesis	12(0-36-0)
วทสร	๖๙๘	วิทยานิพนธ์	

3.1.4 Research Project of the Program

Guidelines for conducting a research project are as follows:

(1) Calcium and bone research

(2) Cardiac physiology

(3) Cancer, extracellular vesicles and metabolic diseases

(4) Neurophysiology and neuroscience
(5) Skeletal muscle physiology
(6) Exercise physiology
(7) Renal physiology, drug discovery and development
(8) Hematopoietic stem cell biology, erythropoiesis regulation, gene and cell therapy for genetic diseases

3.1.5 Definition of Course Codes

Two main pairs of alphabets are defined as follows:

The first alphabet pair is an abbreviation of the faculty offering the course.

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

The second alphabet pair is an abbreviation of the department or the major offering the course.

ID: คร indicates that the course is organized by the multidiscipinary departments

PS: สร indicates that the course is organized by the Department of Physiology

Three digit numbers, ie., 5XX and 6XX indicate that the courses are at graduate study level.

3.1.6 Study Plan

Plan A1 (Research only)

Year	Semester 1	Semester 2
1	SCPS 798 Thesis 9(0-27-0) **Total 9 Credits**	SCPS 798 Thesis 9(0-27-0) **Total 9 Credits**
2	SCPS 798 Thesis 9(0-27-0) **Total 9 Credits**	SCPS 798 Thesis 9(0-27-0) **Total 9 Credits**

Plan A2 (Coursework and Research)

Year	Semester 1	Semester 2
1	SCID 518 Generic Skills in Science Research 1(1-0-2) SCPS 680 Systems Physiology I 3(3-0-6) SCPS 681 Systems Physiology II 3(3-0-6) SCPS 691 Biostatistics for Physiology and Biomedical Research 2(2-0-4) SCPS 606 Physiology Seminar I 1(1-0-2) Elective Courses 3 Credits **Total 13 credits**	SCPS 607 Physiology Seminar II 1(1-0-2) SCPS 609 Scientific Paper Analysis and Writing 1(1-0-2) SCPS 682 Professional Communication Skills 1(1-0-2) Elective Courses 8 Credits SCPS 698 Thesis 2(0-6-0) **Total 13 Credits**
2	SCPS 698 Thesis 5(0-15-0) **Total 5 credits**	SCPS 698 Thesis 5(0-15-0) **Total 5 credits**

3.1.7 Course Description Please see Appendix A.

3.2 Name, I.D. Number, Title and Degree of Instructors

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

No.	Identification Card Number Academic position - Name – Surname	Degree (Field of Study) University: Year of graduate	Department
1	x xxxx xxxxx xx x Professor Dr. Jonggonnee Wattanapermpool	Ph.D. (Physiology and Biophysics) University of Illinois at Chicago, USA: 1994 M.Sc. (Physiology) Mahidol University: 1985 B.Sc. (Radiological Technology) Mahidol University: 1983	Department of Physiology
2	x xxxx xxxxx xx x Professor Dr. Narattaphol Charoenphandhu, MD.	M.D. (Medicine) Mahidol University: 2004 Ph.D. (Physiology) Mahidol University: 2001 B.Sc. (Medical Science) Mahidol University: 1999	Department of Physiology
3	x xxxx xxxxx xx x Associate Professor Dr. Arthit Chairoungdua	Ph.D. (Medical Science) Kyorin University School of Medicine, Japan : 2003 M.Sc. (Toxicology) Mahidol University: 1998 B.N.S. (Nursing Science) Khon Kaen University: 1993	Department of Physiology
4	x xxxx xxxxx xx x Associate Professor Dr. Jittima Weerachayaphorn	Ph.D. (Cellular Physiology and Molecular Biophysics) University of Texas Medical Branch at Galveston, USA: 2007 M.Sc. (Physiology) Mahidol University: 2001 B.N.S. (Nursing Science) Mahidol University: 1995	Department of Physiology
5	x xxxx xxxxx xx x Associate Professor Dr. Ratchakrit Srikuea	Ph.D. (Exercise Science) Mahidol University: 2010 M.Sc. (Sports Science) Mahidol University: 2004 B.Sc. (Sports Science) Mahidol University: 2000	Department of Physiology

No.	Identification Card Number Academic position - Name – Surname	Degree (Field of Study) University: Year of graduate	Department
6	x xxxx xxxxx xx x Associate Professor Dr. Sunhapas Soodvilai	Ph.D. (Physiology) Mahidol University: 2005 B.Pharm (Pharmacy) Ubon Ratchathani University: 2000	Department of Physiology
7	x xxxx xxxxx xx x Associate Professor Dr. Tepmanas Bupha-Intr	Ph.D. (Physiology) Mahidol University: 2005 D.V.M. Chulalongkorn University: 1998	Department of Physiology
8	x xxxx xxxxx xx x Associate Professor Dr. Vitoon Saengsirisuwan	Ph.D. (Physiological Sciences) University of Arizona, USA: 2003 M.Sc. (Exercise Physiology) Mahidol University: 1995 B.Sc. (Physical Therapy) Mahidol University: 1993	Department of Physiology
9	x xxxx xxxxx xx x Assistant Professor Dr. Nattapon Panupinthu, M.D.	M.D. (Medicine) Mahidol University: 2018 Ph.D. (Physiology) The University of Western Ontario, Canada: 2008 B.Sc. (Medical Science) Mahidol University: 2001	Department of Physiology
10	x xxxx xxxxx xx x Assistant Professor Dr. Witchuda Saengsawang	Ph.D. (Physiology and Biophysics) University of Illinois at Chicago, USA: 2008 B.Pharm (Pharmacy) Mahidol University: 2002	Department of Physiology
11	x xxxx xxxxx xx x Lecturer Dr. Kanit Bhukhai	Ph.D. (Biotherapies and Biotechnologies) Sorbonne Paris Cité University – Paris, Diderot University (Paris 7), France : 2015 M.Sc. (Physiology) Mahidol University: 2011 B.Sc. (Public Health) Mahidol University: 2009	Department of Physiology
12	x xxxx xxxxx xx x Lecturer Dr. Ioannis D. Papadimitriou	Ph.D. (Exercise Physiology) Victoria University, Australia: 2018 M.Sc. (Exercise and Health)	Department of Physiology

No.	Identification Card Number Academic position - Name – Surname	Degree (Field of Study) University: Year of graduate	Department
		Aristotle University, Greece: 2009 B.Sc. (Physical Education and Sports Science) Aristotle University, Greece: 2002	
13	x xxxx xxxxx xx x Lecturer Dr. Nittaya Boonmuen	Ph.D. (Physiology) Mahidol University: 2016 B.Sc. (Physical Therapy) Chiang Mai University: 2010	Department of Physiology
14	x xxxx xxxxx xx x Lecturer Dr. Ratchaneevan Aeimlapa	Ph.D. (Physiology) Mahidol University: 2018 M.Sc. (Physiology) Mahidol University: 2014 B.Sc. (Biology) Mahidol University: 2011	Department of Physiology

3.2.2 Part time instructors

Guest lecturers will be invited to teach special lectures.

4. Details of Practicum (if any) N/A

5. Thesis Requirement

5.1 Short Description

Review of literature and Identifying research problem; proposal presentation, conducting research experiments with research ethical standards; data collection, analysis, interpretation, and report in the form of a thesis; publishing research work in international peer-reviewed journal or presenting at an international conference.

Thesis must be relevant to and reflect a knowledge of physiology. It must be submitted in accordance with the format and within the duration specified in the curriculum plan.

5.2 Standard Learning Outcomes

With adequate background knowledge in physiology, students should come up with good research project, perform their thesis with research ethics and complete the work within the allotted time frame. They should also present their research to peers and

academic circle as well as dissiminate their work to the public. The following are the expected learning outcomes for the thesis project.

5.2.1 Demonstrate ethics professional ethics and moral

5.2.2 Evaluate physiological concepts for knowledge transfer/innovation and problem solving

5.2.3 Apply research skills in physiology or related fields to produce publications/innovation

5.2.4 Demonstrate responsibility, leadership, and ability to work with others

5.2.5 Transfer/disseminate knowledge by using various means of communications

5.3 Time Frame

Plan A1 (Research only)

Semester 1 Academic Year 1

Plan A2 (Coursework and Research)

Semester 2 Academic Year 1

5.4 Number of credits 36 credits for plan A1 and 12 credits for plan A2

5.5 Preparation

Students must register for the thesis course following the curriculum plan. Students, in consultation with their potential thesis advisors, proceed to obtain the approval for the proposal advisor via the Faculty of Graduate Studies Online Thesis System. Student with a research project based on animals or human subjects needs to submit his/her research protocol for approval from the respective ethical committee before starting the thesis project. Plan A1 students are required to have their thesis advisor appointed from the beginning and have their thesis committee appointed within the first semester of the first year. For Plan A2 students, their thesis advisor and thesis committee must be appointed within the second semester of the first year.

5.6 Evaluation Process

For the thesis progress evaluation of both Plan A1 and A2, after the thesis proposal examination, students are required to report their thesis progress to the program director and the thesis committee every semester. In addition, students in Plan A1, are to report their research progress every three months both in written and oral presentation formats, and obtain the score of at least 80%; which is to ensure adequate writing and presentation skills. All students are also required to present their reserach progress as well as their research paper in a series of departmental seminars as a part of their communication and discussion training.

For graduation, the final oral examination will be systematically evaluated by the program committee appointed by the Faculty of Graduate Studies, Mahidol University. In addition, student' s thesis work or part (s) of the thesis must be 1) published in peer-reviewed academic national or international journals, which must be on the approval lists of the Office of the Higher Education Commission on Academic Journal Consideration Criteria for Disseminating Academic Output or 2) presented at a national conference with published proceedings that are approved by the Faculty of Graduate Studies, Mahidol University (applied only to Plan A2).

Section 4 Learning Outcome, Teaching Strategies and Evaluation

1. Development of Students' Specific Qualifications

Special Characteristics	Teaching Strategies or Student Activities
- Team work skills - Communication skills	Extracurricular activities organized by the department such as special seminars, physiology research forums, and student competency development. - Extracurricular activities organized by Faculty of Science, Mahidol University such as MU open house, National science and technology fair, and Science kids (national children's day)

2. Development of Learning Outcome in Each Objective

Expected Outcome	Teaching Strategies	Evaluation Strategies
1. Ethics 1) Perform duties with professional ethics and following the regulations 2) Be honest, integrity, disciplined, punctual, respect the rules and no plagiarism	1) Interactive lecture 2) Group/individual assignment 3) Assignment/Laboratory report 4) Project assignment 5) Thesis project	1) Quality of assignment 2) Report evaluation and plagiarism assessment 3) Certificates of attendance 4) Thesis committee evaluation 5) Evaluation by external peer review before publication
2. Knowledge 1) Understand knowledge in physiology 2) Able to acquire and integrate an additional	1) Interactive lecture 2) Laboratory training 3) Case Studies/Discussion 4) Seminar	1) Written examination 2) Hands-on demonstration 4) Evaluation of the quality of presentation and reports by rubrics designed by the

Expected Outcome	Teaching Strategies	Evaluation Strategies
knowledge of the related fields		instructors and course co-ordinator
3. Intellectual Development 1) Able to analyze the problem leading to systemic conclusion 2) Develop the concept of knowledge and works in physiology	1) Group discussion 2) Analysis of case studies 3) Seminar 4) Project assignment 5) Thesis project	1) Evaluation of group discussion by rubrics set by the course coordinators and the program committee 2) Evaluation of seminar participation and presentation by rubrics 3) Evaluation by Thesis committee
4. Interpersonal Relationship and Responsibility 1) Be responsible for the assigned work 2) Ability to work as a team with peers 3) Ability to lead the team and follow	1) Group participation 2) Group discussion with both leader and team member roles 3) Group Assignment 4) Extracurricular activities 5) Thesis	1) Behavioral observation 2) Evaluation of group discussion and presentation by rubrics set by the course coordinators and the program committee 3) Quality of assignment and report by rubrics 4) Evaluation by Thesis committee
5. Mathematical Analytical Thinking, Communication Skills, and Information Technology Skills 1) Effective Mathematical analytical thinking 2) Ability in communication, and presentation 3) Ability to transfer the knowledge effectively using information technology (IT) skills	1) Seminar 2) Thesis project 3) Small group discussion and presentation 4) Interactive lecture	1) Behavior observation in classrooms and laboratory 2) Evaluation of group discussion and presentation by rubrics 3) Evaluation of seminar participation and presentation by rubrics 4) Evaluation of the quality of reports by rubrics 5) Conference proceedings or international publication 6) Thesis committee evaluation

3. Curriculum Mapping

Please see Appendix C.

Section 5 Criteria for Student Evaluation

1. Grading System

Grading system and graduation criteria shall be in compliance with the criteria stated in the regulations of Faculty of Graduate Studies, Mahidol University.

(1) The symbols and their assigned scores

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

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	Fail	0.00

(2) The symbols without scores

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

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

2. Evaluation Process for the Learning Outcome of Students

2.1 Provide an evaluation process from both students and curriculum committees for each course based on the learning outcomes.

2.2 Provide student's learning outcome from overall curriculum evaluation during the Department of Physiology annual strategic planning.

3. Graduation Requirement

3.1 Plan A1 (Research only)

1) Total time of study should not exceed the study plan.

2) Students might attend additional courses according to advisor's suggestion without taking credits, and must complete no less than 36 credit-thesis.

3) Students must meet the English Competence Standard of Graduate Students, Mahidol University defined by the Faculty of Graduate Studies, Mahidol University.

4) Students must participate in and pass skill development activities required by the Faculty of Graduate Studies, Mahidol University.

5) Students must submit their thesis and pass oral thesis defense examination evaluated by the committees that are appointed by the Faculty of Graduate Studies, Mahidol University. In addition, student's oral thesis defense is open for interested people to attend.

6) Thesis or part(s) of student's thesis must be accepted or published at least as 1 paper in a national or international peer-reviewed academic journals of a quality that is approved by the Office of Higher Education Commission on Academic Journal Consideration Criteria for Disseminating Academic Output. First author publication is advised but not compulsary.

3.2 Plan A2 (Coursework and research)

1) Total time of study should not exceed the study plan.

2) Students must complete the 36 credit-program which include 12 credit-thesis and 24 credit-course work with a minimum CUM-GPA of 3.00.

3) Students must meet the English Competence Standard of Graduate Students, Mahidol University defined by the Faculty of Graduate Studies, Mahidol University.

4) Students must participate in and pass skill development activities required by the Faculty of Graduate Studies, Mahidol University

5) Students must submit their thesis and pass oral thesis defense examination evaluated by the committees that are appointed by the Faculty of Graduate Studies, Mahidol University. In addition, student's oral thesis defense is open for interested people to attend.

6) Thesis or part (s) of student's thesis must be 1) accepted or published at least as 1 paper with first or co-cuthorship in a national or international peer-reviewed academic journals of a quality that is approved by the Office of Higher Education Commission on Academic Journal Consideration Criteria for Disseminating Academic Output or 2) presented at a national or international conference with published proceedings that are approved by the Faculty of Graduate Studies, Mahidol University.

Section 6 Faculty Development

1. Orientation for New Faculty Members

1.1 All new full-time and part-time faculty members must attend organized workshop so that they will be fully informed about the curriculum.

1.2 Program director explains the objectives of the program, program learning outcomes, and teaching/evaluation strategies to the new faculty members.

1.3 New faculty members are informed about the thesis advisory process which follows the regulations of the Faculty of Graduate Studies, Mahidol University.

2. Skill and Knowledge Development for Faculty Members

2.1 Skills Development in Teaching and Evaluation

2.1.1 The department will support faculty members in attending workshops or any activities organized by MU on teaching performance development.

2.1.2 The department will encourage faculty members to participate in teaching and learning development activities organized by other internal and external agencies.

2.2 Other Academic and Professional Skill Development

2.2.1 The department will support faculty members in developmental needs, i.e., attending conferences both at national and international levels.

2.2.2 By providing partial funding for research work and presentation at academic conferences.

2.2.3 By encouraging faculty members to attend training opportunities to expand their knowledge and develop other skills such as writing research project for funding and publication.

Section 7 Quality Assurance

1. Regulatory Standard

Courses in the curriculum are organized according to the Thai Qualification Framework for Higher Education. Prior to the start of the semester, regular meetings are held to plan teaching and learning strategies for all courses. Course syllabus, lesson plans and evaluation forms are provided at the beginning of the semester. At the end of each course, meeting is help to discuss how to improve teaching and learning experience of the students in the next semester.

2. Graduates

The graduate students of physiology program are continuously trained along the entire curriculum to assure that they have achieved high qualified education of an

international standard. The development of curriculum and courses is based on both the Thai Qualification Framework for Higher Education and feedbacks from all stakeholders.

3. Students

Student admission, enrollment, and graduation are in accordance with the regulations of the Faculty of Graduate Studies, Mahidol University (https://graduate.mahidol.ac.th/inter/).

4. Instructors

Instructors qualifications are ensured to meet the criteria of the Thai Qualification Framework for Higher Education B.E. 2558. In addition, instructor ability and competency in the curriculum must be able to contribute to and fulfill the curriculum planning and development. For course organization, the assigned instructor is responsible for the course contents ie., course objectives, course schedule, syllabus, and evaluation methods. Course progress report is a regular agenda item in the department's monthly meeting. The responsible instructors will present the course progress and their opinion on teaching and learning issues and make sure that they receive feedback for improvement of the course to meet the quality standard of higher education.

5. Program, Study and Student Assessment

The qualifications of the curriculum must meet the criteria of the Thai Qualification Framework for Higher Education B.E. 2558. Student assessment during study in the program is aligned with the Program Learning Outcomes (PLOs). The use of rubric assessment system where discussion and presentation are concerned is stated in the course content. Course and instructor evaluations by students are always monitored by the course coordinator and program director and used for improvement of the courses and teaching quality. Moreover, Program director reports on the ongoing activities and student progress in the curriculum on a monthly basis in the departmental meeting. Additionally, student satisfaction of the curriculum is evaluated annually during the Department of Physiology Strategic Planning, and the information is used for further curriculum development.

6. Learning Support

The curriculum is responsible for providing high qualified laboratory equipments to support the learning outcomes of students regarding the understanding of fundamental principles in physiology and research experiencesprovides. The Faculty also provides an essential supporting facility ie., Central Animal Facility (CAF), which has werned an accreditation by AAALAC International, thus demonstrating its commitment to responsible animal care and use. Furthermore, all students are eligible to use the equipments and

services at the Central Instrument Facility (CIF) and Central Nanoimaging (CNI) unit at the Faculty of Science to facilitate research activities. In addition, the Faculty of Science Central Library (Stang Mongkolsuk Library) has a large stock of textbooks and research publications available for students to access in support of their study and research, which most research materials available online.

7. Key Performance Indicators

The Physiology program, Department of Physiology provides five year-curricular key performance indicators that meet the standards of the Thai Qualifications Framework as follow: (1) the compulsory performance indicators (numbers 1-5) must attain levels above expectation and (2) the total number of performance indicators must reach their goal by no less than 80 percent each year. The Key Performance Indicators are shown below:

Key Performance Indicators	Academic Year				
	2023	2024	2025	2026	2027
1. At least 80% of all full-time instructors in each program have participated in meetings that set up plans to evaluate and revise the curriculum.	✓	✓	✓	✓	✓
2. The program contains details of the curriculum according to TQF2, which is based on the Thai Qualifications Framework and the standards of the program (if any)	✓	✓	✓	✓	✓
3. The program shows course specifications and field experience specifications (if any) according to TQF3 before the beginning of each semester	✓	✓	✓	✓	✓
4. Instructors submit course reports and file experience reports (if any) according to TQF5 within 30 days after the end of the semester.	✓	✓	✓	✓	✓
5. Instructors produce program reports according to TQF7 within 60 days after the end of the academic year	✓	✓	✓	✓	✓
6. Instructors revise the grading of students according to the learning standards indicated in TQF3 for at least 25 percent of the courses offered each academic year.	✓	✓	✓	✓	✓
7. Instructors assess the development and/ or improvement of teaching methods, teaching		✓	✓	✓	✓

Key Performance Indicators	Academic Year				
	2023	2024	2025	2026	2027
techniques or the grading system from the evaluation results in TQF 7 of the previous year.					
8. Every new instructor (if any) has participated in the orientation and received adequate information on the faculty's teaching requirements.	✓	✓	✓	✓	✓
9. Full-time instructors show evidence of academic and/ or profession improvement at least once a year.	✓	✓	✓	✓	✓
10. The number of supporting staff (if any) with evidence showing academic and/ or professional improvement by at least 50 percent each year.	✓	✓	✓	✓	✓
11. The level of satisfaction from the previous year' s students and new graduates toward curriculum quality, with an average score of at least 3.5 out of 5	-	-	✓	✓	✓
12. The level of satisfaction from employers of new graduates with an average score of at least 3.5 out of 5	-	-	-	✓	✓
13. All instructors have been evaluated by students after teaching (100 percent).	✓	✓	✓	✓	✓
14. The number of accepted students in accordance with the program's plan.	✓	✓	✓	✓	✓
15. Graduates who get a job with a starting rate salary not lower than the rate stated by the Office of the Civil Service Commission (OCSC).	-	-	✓	✓	✓

Section 8 Evaluation and Improvement of the Curriculum Implementation

1. Evaluation on the Teaching Efficiency

1.1 Evaluation of Teaching Strategies

1.1.1 Analysis from student's evaluation of the courses and instructors

1.1.2 Analysis from the faculty meeting to exchange ideas or comments

1.1.3 Analysis from the annual department strategic planning

1.2 Evaluation of Instructor's Skills in Using Teaching Strategies

1.2.1 Analysis student's evaluation of the courses and instructors

1.2.2 Evaluation from senior instructors

2. Overall Evaluation of the Curriculum

2.1 Survey of the curriculum's satisfaction by current students, instructors, alumni, and employers

2.2 Survey of the requirement of knowledge and skills of graduates from current and potential stakeholders

2.3 Curriculum evaluation by external experts

3. Evaluation of Curriculum Implementation in Accordance with the Curriculum

Evaluation is made annually by the chairperson and instructors according to the key performance indicators of section 7, item 7. The curriculum committee must comprise of 3 persons: 1) Program director, 2) Curriculum committee members, and 3) Curriculum secretariat. The criteria of curriculum revision are **Good**.

"Fair" means the program does not cover the first 10 Key Performance Indicators,

"Good" means the program shows all first 10 Key Performance Indicators,

"Excellent" means the program has all Key Performance Indicators.

4. Review of the Evaluation and Plans for Improvement

4.1 Collecting all information, advice, and evaluations of the recent graduates, stakeholders, and experts;

4.2 Review and analyze the above information by the faculty member in-charge of the program;

4.3 Presenting the improvement plan of the program to the Faculty of Graduate Studies.

APPENDIX A

Course Description

Appendix A
Course Description

1) Required Courses

Credits (lecture – practice – self-study)

SCID 518 Generic Skills in Science Research 1(1-0-2)
วทคร ๕๑๘ ทักษะทั่วไปในการวิจัยทางวิทยาศาสตร์

Qualities of a good researcher, effective searching of the scientific information, laboratory safety, biosafety, chemical safety, radiation safety and electrical safety, ethics of research in human subjects and experimental animals in science, Intellectual property rights, research misconduct attribution of credit and responsibility, techniques in formulating and writing thesis proposals, research projects, grant applications, reseach reports and manuscript for publication.

คุณสมบัติของนักวิจัยที่ดี การค้นหาข้อมูลในฐานข้อมูลทางวิทยาศาสตร์อย่างมีประสิทธิภาพ ความปลอดภัยในห้องปฏิบัติการ ความปลอดภัยทางชีวภาพ เคมี รังสี และไฟฟ้า จริยธรรมในการวิจัยในมนุษย์ และการทดลองสัตว์ในด้านวิทยาศาสตร์ สิทธิในทรัพย์สินทางปัญญา การกระทำผิดคุณลักษณะของความรับผิดชอบและการอ้างอิงผลงานวิจัย เทคนิคการสร้างและการเขียนโครงร่างโครงการวิจัย การเขียนขอทุนวิจัย การเขียนรายงานวิจัย และต้นฉบับเพื่อส่งตีพิมพ์

SCPS 606 Physiology Seminar I 1(1-0-2)
วทสร ๖๐๖ สัมมนาสรีรวิทยา ๑

Basic techniques in handling original research articles in physiology: presenting the research rationale and experimental approach, analyzing, critiquing and presenting key findings; techniques in handling discussion and questions.

เทคนิคพื้นฐานในการวิเคราะห์ วิจารณ์ และนำเสนอสาระสำคัญ ที่มาของประเด็นปัญหา วิธีการวิจัย ผลการวิจัย จากบทความวิจัยทางสรีรวิทยา เทคนิคการอภิปรายให้ข้อคิดเห็น และตอบข้อซักถาม

SCPS 607 Physiology Seminar II 1(1-0-2)
วทสร ๖๐๗ สัมมนาสรีรวิทยา ๒

Advance techniques in handling original, complex and multiple research articles in physiology: presenting the research rationale and experimental approach, analyzing, critiquing and presenting key findings; techniques in handling discussion and questions.

เทคนิคขั้นสูงในการวิเคราะห์ วิจารณ์ และนำเสนอสาระสำคัญ ที่มาของประเด็นปัญหา วิธีการวิจัย ผลการวิจัย จากบทความวิจัยทางสรีรวิทยาและสาขาที่เกี่ยวข้องที่มีความซับซ้อนและหลากหลาย เทคนิคการอภิปรายให้ข้อคิดเห็น และตอบข้อซักถาม

Credits (lecture – practice – self-study)

SCPS 609 Scientific Paper Analysis and Writing 1(1-0-2)

วทสร ๖๐๙ การวิเคราะห์และการเขียนบทความทางวิทยาศาสตร์

Reading scientific articles in Physiology with critical and analytical attention; discuss the experimental design, experimental objectives and rationale, statistical analysis; evaluation of evidence and interpretation; techniques for writing research proposals, review articles and different types of research articles; ethical guidelines for scientific writing.

การอ่านและวิเคราะห์บทความทางสรีรวิทยา การวิเคราะห์การวางแผนการทดลอง วัตถุประสงค์ หลักการและเหตุผล การวิเคราะห์ทางสถิติ การประเมินผลและการแปลผล และอภิปราย การเขียนข้อเสนอโครงการ บทความรีวิว และบทความทางวิชาการจากงานวิจัย ข้อปฏิบัติด้านจริยธรรมการเขียนทางวิทยาศาสตร

SCPS 680 Systems Physiology I 3(3-0-6)

วทสร ๖๘๐ สรีรวิทยาเชิงระบบ ๑

Mechanisms underlying the functions of the cells, the nervous system, muscles, and cardiovascular system; coordination of these systems to maintain the homeostasis of internal environment in response to fluctuations in the external environment.

กลไกการทำงานของเซลล์ ระบบประสาท กล้ามเนื้อและระบบไหลเวียนโลหิต การทำงานที่สอดประสานกันของระบบต่าง ๆ เพื่อการทรงสภาพปกติของสภาวะแวดล้อมภายในกายต่อการถูกรบกวนจากสภาวะแวดล้อมภายนอก

SCPS 681 Systems Physiology II 3(3-0-6)

วทสร ๖๘๑ สรีรวิทยาเชิงระบบ ๒

Mechanisms underlying the functions of the respiratory, renal, digestive, endocrine, and reproductive systems; coordination of these systems to maintain the homeostasis of internal environment in response to fluctuations in the external environment.

กลไกการทำงานของระบบหายใจ ระบบไต ระบบย่อยอาหาร ระบบต่อมไร้ท่อ และระบบสืบพันธุ์ การทำงานที่สอดประสานกันของระบบต่าง ๆ เพื่อการทรงสภาพปกติของสภาวะแวดล้อมภายในกายต่อการถูกรบกวนจากสภาวะแวดล้อมภายนอก

Credits (lecture – practice – self-study)

SCPS 682 Professional Communication Skills 1(1-0-2)
วทสร ๖๘๒ ทักษะการสื่อสารอย่างมืออาชีพ

Professional communication skills; techniques for different style of public speaking and presentation, poster presentation, oral presentation, pitching.

ทักษะในการสื่อสารอย่างมืออาชีพ เทคนิคในการพูดและการนำเสนอในที่สาธารณะในรูปแบบต่าง ๆ การนำเสนอในรูปแบบโพสเตอร์ การนำเสนอในรูปแบบปากเปล่า การนำเสนอไอเดียเชิงธุรกิจ

SCPS 691 Biostatistics for Physiology and Biomedical Research 2(2-0-4)
วทสร๖๙๑ ชีวสถิติสำหรับสรีรวิทยาและการวิจัยวิทยาศาสตร์การแพทย์

Basic and essential background for biostatistics frequently used in biomedical research; principles and application of statistical methods for hypothesis testing, experimental design and data analyses; statistical methods in the field of molecular and cell biology including imaging techniques, biochemical assays and bioinformatics; calculation of sample size in animal research; frequently used statistical methods for animal experimentation; the types of study design in clinical study; statistical methods in human research.

พื้นฐานที่จำเป็นสำหรับการวิเคราะห์ข้อมูลเชิงชีวสถิติที่ใช้บ่อยในงานวิจัยด้านวิทยาศาสตร์สุขภาพ หลักการและการประยุกต์ใช้วิธีการทางสถิติเพื่อการตั้งสมมุติฐาน การออกแบบงานทดลอง และการประเมินผลในงานวิจัย การใช้วิธีการวิเคราะห์ทางชีวสถิติสำหรับงานวิจัยระดับชีวโมเลกุลและเซลล์ที่เกี่ยวข้องกับการวิเคราะห์ภาพ การวัดทางชีวเคมี และงานทางชีวสารสนเทศ การคำนวณหาจำนวนสัตว์ที่เหมาะสมในงานวิจัย การวิเคราะห์ข้อมูลเชิงชีวสถิติที่ใช้บ่อยในงานวิจัยที่ใช้สัตว์ทดลอง สถิติสำหรับงานวิจัยในมนุษย์

2) Elective Courses

SCID 500 Cell and Molecular Biology 3(3-0-6)
วทคร ๕๐๐ ชีววิทยาระดับเซลล์และโมเลกุล

Cell structure and function; life and information flow in cell, energy flow in biosystem; cell signaling; cell division; cellular differentiation; cell death and development.

โครงสร้างและหน้าที่ของเซลล์ ชีวิตและการส่งผ่านข้อมูลภายในเซลล์ การส่งผ่านพลังงานในระบบชีวภาพ การส่งสัญญาณของเซลล์ การแบ่งตัวของเซลล์ การพัฒนาเป็นเซลล์ชนิดจำเพาะ การตายและการพัฒนาของเซลล์

Credits (lecture – practice – self-study)

SCID 507 Microscopic Technique 1(0-2-1)
วทคร ๕๐๗ เทคนิคการใช้กล้องจุลทรรศน์

Structure and operation of light microscope, phase, dark field and differential interference contrast microscopes, confocal microscope, fluorescence microscope, transmission electron microscope (TEM), scanning electron microscope (SEM), specimen collection, fixation, sectioning, basic staining and immunocytochemical methods for microscopic examination, photography and interpretation of the results, laboratory rules and regulations.

โครงสร้างและการใช้งาน กล้องจุลทรรศน์ แบบธรรมดา แบบเฟส แบบพื้นมืด และแบบดิฟเฟอเรนเชียล อินเตอร์เฟอเรนซ์ คอนทราสท์ กล้องคอนโฟคัล กล้องฟลูออเรสเซนต์ กล้องจุลทรรศน์อิเล็กตรอนชนิดส่องผ่าน กล้องจุลทรรศน์อิเล็กตรอนชนิดส่องกราด การเก็บตัวอย่าง การตรึง การตัดชิ้นเนื้อให้บาง การย้อมสีขั้นพื้นฐานและการย้อมสีเซลล์โดยใช้วิธีทางเคมีที่เกี่ยวกับวิทยาภูมิคุ้มกัน การตรวจสอบ การถ่ายภาพและการแปลผลภาพ กฎและระเบียบการใช้ห้องปฏิบัติการ

SCID 509 Separation Techniques 1(0-2-1)
วทคร ๕๐๙ เทคนิคการแยกสาร

Separation of biomolecules and biochemicals, based on size, shape, charge and state, using centrifugation, chromatography, electrophoresis and dialysis, laboratory rules and regulations.

การแยกสารชีวโมเลกุลและสารชีวเคมี ตามขนาด รูปร่าง ประจุ และสถานะ โดยใช้วิธีการหมุนเหวี่ยง โครมาโทกราฟี การเคลื่อนย้ายสู่ขั้วไฟฟ้า และการแยกสารผ่านเยื่อ กฎและระเบียบการใช้ห้องปฏิบัติการ

SCID 513 Animal Cell Culture Techniques 1(0-2-1)
วทคร ๕๑๓ เทคนิคการเพาะเลี้ยงเซลล์สัตว์

Basic techniques for cultivation of anchorage-dependent and anchorage-independent cells, mass production of animal cells, propagation, determination of cell growth and maintenance of cell lines, cryo-preservation of cells and determination of cell survival after cold storage, effect of certain parameters on the growth of anchorage-independent cell line; laboratory rules and regulations.

เทคนิคขั้นพื้นฐานในการเพาะเลี้ยงเซลล์ชนิดที่เจริญแบบเกาะติดและที่เจริญแบบไม่เกาะติด การเพาะเลี้ยงเซลล์สัตว์ในปริมาณสูง การขยายพันธุ์เซลล์ การเจริญของเซลล์และการคงสภาพสายพันธุ์เซลล์ การถนอมเซลล์โดยใช้ความเย็น และการตรวจเซลล์ที่รอดชีวิตหลังแช่แข็ง ผลของตัวแปรบางอย่างต่อการเจริญของสายพันธุ์เซลล์แบบไม่เกาะติด กฎและระเบียบการใช้ห้องปฏิบัติการ

Credits (lecture – practice – self-study)

SCID 514 Animal Experimentation in Biomedical Research 1(0-2-1)
วทคร ๕๑๔ การใช้สัตว์ทดลองในงานวิจัยทางชีวการแพทย์

Ethics on animal experimentation, selection of animal model, standard animal care, basic techniques for animal experimentation, special techniques in animal experiments, laboratory rules and regulations.

จริยธรรมการทดลองโดยใช้สัตว์ การเลือกรูปแบบสัตว์ มาตรฐานการดูแลสัตว์ เทคนิคพื้นฐานสำหรับการทดลองที่ใช้สัตว์ เทคนิคพิเศษในการทดลองในสัตว์ กฎและระเบียบการใช้ห้องปฏิบัติการ

SCPS 669 Clinical Exercise Physiology 2(2-0-4)
วทสร ๖๖๙ สรีรวิทยาการออกกำลังกายทางคลินิก

Pathophysiology, risk stratification, contraindications and exercise prescription guidelines for individuals with cardiovascular diseases, pulmonary diseases, obesity and metabolic syndrome, diabetes mellitus, non- communicable diseases, hypertension, musculoskeletal injuries, osteoporosis, and physiology of aging

พยาธิสรีรวิทยา ระดับความเสี่ยง ข้อควรระวัง และแนวทางการกำหนดวิธีการออกกำลังกายในกลุ่มผู้ป่วยโรคหัวใจและหลอดเลือด โรคปอด โรคอ้วนลงพุง เบาหวาน โรคไม่ติดต่อเรื้อรัง ความดันโลหิตสูง ภาวะบาดเจ็บของกล้ามเนื้อและกระดูก กระดูกพรุน และสรีรวิทยาของผู้สูงอายุ

SCPS 675 Molecular Exercise Physiology 2(2-0-4)
วทสร ๖๗๕ สรีรวิทยาการออกกำลังกายระดับโมเลกุล

Effect of exercise on the cell; genetic responsiveness to exercise training; effect of exercise on protein synthesis and degradation; effect of exercise training on body electrolytes; lactate transport; exercise effect intracellular signaling; exercise and free radical; muscle hypertrophy; angiogenesis; exercise and the brain function

ผลของการออกกำลังกายต่อเซลล์ การตอบสนองทางพันธุกรรมหลังการฝึกฝนออกกำลังกาย ผลของการออกกำลังกายต่อการสร้างและสลายโปรตีน ผลของการฝึกฝนการออกกำลังกายต่อสารอิเล็กโทรไลต์ การขนส่งแลคเตท ผลของการออกกำลังกายต่อกระบวนการส่งสัญญาณภายในเซลล์ การออกกำลังกายกับอนุมูลอิสระ การโตเกินของกล้ามเนื้อ การสร้างเส้นเลือดใหม่ การออกกำลังกายกับการทำงานของสมอง

Credits (lecture – practice – self-study)

SCPS 684 Functional Anatomy and Kinesiology 2(2-0-4)
วทสร ๖๘๔ กายวิภาคศาสตร์และวิทยาศาสตร์การเคลื่อนไหว

The relationship between structures of bones, ligaments, and joint capsules and dynamic functions of muscles; the muscle attachments, actions, and innervations; the lever system and body movement; the methods for creating movement of the neck and torso, upper and lower extremities

ความสัมพันธ์ระหว่างโครงสร้างของกระดูก เอ็นยึดระหว่างกระดูก ผนังหุ้มข้อต่อ และการทำงานของกล้ามเนื้อในการเคลื่อนไหว จุดเกาะของกล้ามเนื้อ เส้นประสาท ระบบคานและการเคลื่อนไหว ขั้นตอนการสร้างการเคลื่อนไหวของคอ ลำตัว รยางค์ส่วนบนและล่าง

SCPS 685 Nutrition for Health and Sport 2(2-0-4)
วทสร ๖๘๕ โภชนาการสำหรับสุขภาพและการกีฬา

Biochemistry of macronutrients and micronutrients; food absorption and metabolism; fuel food, water, healthy and sport drinks; nutrition in weight control; nutrition in muscle gain and strength; nutrition in endurance sport; nutrition ergonomic aids; nutrition for special population

ชีวเคมีของสารอาหารหลักและสารอาหารรอง การดูดซึมสารอาหารและกระบวนการเผาผลาญอาหารให้พลังงาน น้ำ น้ำดื่มเพื่อสุขภาพและเพื่อการแข่งกีฬา โภชนาการกับการควบคุมน้ำหนัก โภชนาการกับการสร้างกล้ามเนื้อและความแข็งแรง โภชนาการกับกีฬาที่อาศัยความอดทน สารอาหารเพิ่มประสิทธิภาพในการออกกำลังกาย โภชนาการจำเพาะกลุ่มประชากร

SCPS 688 Current Topics in Exercise Science 2(2-0-4)
วทสร ๖๘๘ หัวข้อปัจจุบันทางวิทยาศาสตร์การออกกำลังกาย

Application and integration of exercise physiology knowledge with other disciplines; new technologies in exercise science and related fields

การประยุกต์และความเชื่อมโยงความรู้ทางสรีรวิทยาการออกกำลังกายกับศาสตร์อื่นๆ เทคโนโลยีใหม่ทางวิทยาศาสตร์การออกกำลังกายและศาสตร์ที่เกี่ยวข้อง

SCPS 692 Fundamental Biomedical Innovation 1(1-0-2)
วทสร ๖๙๒ นวัตกรรมชีวการแพทย์พื้นฐาน

Fundamental of how to create innovation using business model canvas (BMC) ; connecting innovation to customer needs; getting an idea into a product; development and commercialization of biomedical products; intellectual property protection.

การเรียนรู้ขั้นพื้นฐาน วิธีคิดในการสร้างนวัตกรรมโดยใช้เครื่องมือที่ช่วยออกแบบโมเดลธุรกิจ การนำนวัตกรรมไปเชื่อมโยงกับความต้องการของลูกค้า การสร้างแนวคิดในการพัฒนาผลิตภัณฑ์ใหม่ การพัฒนาและการค้าผลิตภัณฑ์ชีวการแพทย์ การคุ้มครองทรัพย์สินทางปัญญา

Credits (lecture – practice – self-study)

SCPS 693 Technology Entrepreneurship 1(0-2-1)

วทสร ๖๙๓ ผู้ประกอบการธุรกิจเทคโนโลยี

Basic knowledge on how to become entrepreneurs; matching with promising technology/ innovation; identification of customer needs; technology- based businesses; commercialize technologies; venture creation process.

ความรู้พื้นฐานในการเป็นผู้ประกอบการ; การจับคู่กับเทคโนโลยี/นวัตกรรม; การเข้าใจความต้องการของลูกค้า; ธุรกิจขับเคลื่อนด้วยเทคโนโลยีและนวัตกรรม; การนำวิธีการคิดเชิงวิพากษ์มาใช้เพื่อการค้า/ธุรกิจด้านเทคโนโลยีและนวัตกรรม; กระบวนการคิดและการลงทุน

SCPS 694 Development of Drugs and Nutraceutical Products 2(2-0-4)

วทสร ๖๙๔ การพัฒนายาและโภชนเภสัชภัณฑ์

Principal of how new drugs and nutraceuticals are taken from the laboratory to the marketplace; integration of knowledge of the multi-disciplined process in the areas of discovery, development, manufacturing, national regulatory approval of new medicines and nutraceuticals.

หลักการพื้นฐานการพัฒนายาใหม่และเภสัชภัณฑ์ตั้งแต่ระดับห้องปฏิบัติการสู่ตลาด การเชื่อมโยงความรู้ด้านต่าง ๆ เพื่อการค้นหาและการพัฒนาสำหรับการผลิตยาและเภสัชภัณฑ์ใหม่ กฎระเบียบระดับชาติสำหรับการขึ้นทะเบียนยาและเภสัชภัณฑ์ใหม่

Thesis

Plan A1 (Research only)

SCPS 798 Thesis 36(0-108-0)

วทสร ๗๙๘ วิทยานิพนธ์

Identifying research project title; submitting research proposal; conducting research study with concern of ethics; data collection, analysis, synthesis and critics of research results; report the thesis progress in terms of written report and oral presentation; reporting the research results in terms of thesis; thesis presentation. Publishing the research results in academic printing materials or journal or presenting it in academic conference; ethics in dissemination of the research results.

การกำหนดหัวข้อโครงการวิจัย การเสนอโครงร่างการวิจัย การดำเนินการวิจัย อย่างมีจริยธรรม การรวบรวมข้อมูล การวิเคราะห์ สังเคราะห์และวิพากษ์ข้อมูลผลการวิจัย การนำเสนอความคืบหน้าของงานวิจัยในรูปแบบรายงานและการนำเสนอแบบปากเปล่าที่มีคุณภาพดีมาก การนำผลการวิจัยมาเรียบเรียงเป็นวิทยานิพนธ์ การนำเสนอวิทยานิพนธ์ การเผยแพร่ผลงานวิจัยในวารสารหรือสิ่งพิมพ์ทางวิชาการ หรือเสนอต่อที่ประชุมวิชาการ จริยธรรมในการเผยแพร่ผลงานวิจัย

Credits (lecture – practice – self-study)

Plan A2 (Course work and Research)

SCPS 698 Thesis 12(0-36-0)

วทสร ๖๙๘ วิทยานิพนธ์

Identifying research project title; submitting research proposal; conducting research study with concern of ethics; data collection, analysis, synthesis and critics of research results; reporting the research results in terms of thesis; thesis presentation. Publishing the research results in academic printing materials or journal or presenting it in academic conference; ethics in dissemination of the research results.

การกำหนดหัวข้อโครงการวิจัย การเสนอโครงร่างการวิจัย การดำเนินการวิจัย อย่างมีจริยธรรม การรวบรวมข้อมูล การวิเคราะห์ สังเคราะห์และวิพากษ์ข้อมูลผลการวิจัย การนำผลการวิจัยมาเรียบเรียงเป็นวิทยานิพนธ์ การนำเสนอวิทยานิพนธ์ การเผยแพร่ผลงานวิจัยในวารสารหรือสิ่งพิมพ์ทางวิชาการ หรือเสนอต่อที่ประชุมวิชาการ จริยธรรมในการเผยแพร่ผลงานวิจัย

APPENDIX B

Curriculum Vitae of the Faculty in Charge of the Program

Appendix B
Curriculum Vitae of the Faculty in Charge of the Program

1. Name: Professor Dr. Jonggonnee Wattanapermpool

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Physiology & Biophysics	University of Illinois at Chicago, U.S.A.	1994
M.Sc.	Physiology	Mahidol University	1985
B.Sc.	Radiological Technology	Mahidol University	1983

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Role of sex hormones in cardiac function
2. Impact of regular exercise on cardiac function

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Kampaengsri T, Ponpuak M, **Wattanapermpool J**, Bupha-Intr T*. Deficit of female sex hormones desensitizes rat cardiac mitophagy. Chin J Physiol 2021 Apr;64(2):72-9.	12/1	2021
	Phungphong S, Kijtawornrat A, **Wattanapermpool J**, Bupha-Intr T. Improvement in cardiac function of ovariectomized rats by antioxidant tempol. Free Radic Biol Med. 2020 Nov 20;160:239-245.	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Phungphong S, Kijtawornrat A, Kampaengsri T, **Wattanapermpool J**, Bupha-Intr T. Comparison of exercise training and estrogen supplementation on mast cell-mediated doxorubicin-induced cardiotoxicity. Am J Physiol Regul Integr Comp Physiol. 2020 May 1;318(5):R829-R842.	12/1	2020
	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 Feb 1;316(2):H360-H370.	12/1	2019
	Wadthaisong M, Witayavanitkul N, Bupha-Intr T, **Wattanapermpool J**, de Tombe PP*. Chronic high-dose testosterone treatment: impact on rat cardiac contractile biology. Physiol Rep 2019 Jul;7(14):e14192.	12/1	2019

Current Teaching Load

1	SCID 500 Cell and Molecular Biology	3(3-0-6)
2	SCID 503 Systemic Bioscience	3(3-0-6)
3	SCID 518 Generic Skills in Science Research	1(1-0-2)
4	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
5	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
6	SCPS 101 Health and Wellness	2(2-0-0)
7	SCPS 202 Basic Physiology	3(2-3-5)
8	SCBM 261 Physiology for Medical Science I	2(2-0-4)
9	SCBM 262 Physiology for Medical Science II	2(2-0-4)
10	SCBM 263 Physiology for Medical Science III	3(3-0-6)
11	SCID 112 Introduction to Research	1(1-0-2)
12	SCID 221 Cardiovascular System I	3(2-2-5)
13	SCID 222 Cardiovascular System II	2(2-0-4)

14	SCID 223 Respiratory System	4(3-2-7)
15	SCID 224 Renal and Urinary System	3(3-0-6)
16	SCID 311 Gastrointestinal and Hepatobiliary System	3(2-2-5)
17	SCID 313 Endocrine System	3(3-0-6)
18	SCPS 606 Physiology Seminar I	1(1-0-2)
19	SCPS 607 Physiology Seminar II	1(1-0-2)
20	SCPS 608 Physiology Seminar III	1(1-0-2)
21	SCPS 623 Neurophysiology	2(2-0-4)
22	SCPS 630 Scientific Paper Analysis	1(0-2-1)
23	SCPS 639 Laboratory Teaching in Physiology	1(0-3-1)
24	SCPS 667 Cardiorespiratory Responses to Exercise and Environmental Stress	2(2-0-4)
25	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
26	SCPS 677 Seminar in Physiology IV	1(1-0-2)
27	SCPS 678 Scientific Writing and Communication	1(0-3-0)
28	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
29	SCSP 680 Systems Physiology I	3(3-0-6)
30	SCSP 681 Systems Physiology II	3(3-0-6)
31	SCPS 682 Professional Communication Skills	1(1-0-2)
32	SCPS 698 Thesis	12(0-36-0)
33	SCPS 699 Dissertation	36(0-108-0)
34	SCPS 799 Dissertation	48(0-144-0)
35	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

2. Name: Professor Dr. Narattaphol Charoenphandhu, MD.

Education

Degree	Degree Name	Institute	Year of Graduation
M.D.	Medicine	Mahidol University	2004
Ph.D.	Physiology	Mahidol University	2001
B.Sc.	Medical Science	Mahidol University	1999

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Bone and calcium physiology
2. Development of calcium supplement product

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Chanpaisaeng K, Teerapornpuntakit J, Wongdee K, **Charoenphandhu N***. Emerging roles of calcium-sensing receptor in the local regulation of intestinal transport of ions and calcium. Am J Physiol Cell Physiol 2021 Mar;320(3):C270-C278.	12/1	2021
	Tiyasatkulkovit W, Aksornthong S, Adulyaritthikul P, Upanan P, Wongdee K, Aeimlapa R, Teerapornpuntakit J, Rojviriya C, Panupinthu N, **Charoenphandhu N**. Excessive salt consumption causes systemic calcium mishandling and worsens microarchitecture and strength of long bones in rats. Sci Rep. 2021 Jan;11:1850	12/1	2021
	Namhong S, Wongdee K, Suntornsaratoon P, Teerapornpuntakit J, Hemstapat R, **Charoenphandhu N**. Knee osteoarthritis in	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	young growing rats is associated with widespread osteopenia and impaired bone mineralization. Sci Rep. 2020;10(1):15079		
	Rittidach T, Tithito T, Suntornsaratoon P, **Charoenphandhu N**, Thongbunchoo J, Krishnamra N, et al. Effect of zirconia-mullite incorporated biphasic calcium phosphate/biopolymer composite scaffolds for bone tissue engineering. Biomed Phys Eng Express. 2020;6(5):055004.	12/1	2020
	Lertsuwan K, Nammultriputtar K, Nanthawuttiphan S, Tannop N, Teerapornpuntakit J, Thongbunchoo J, **Charoenphandhu N**. Differential effects of Fe^{2+} and Fe^{3+} on osteoblasts and the effects of $1,25(OH)_2D_3$, deferiprone and extracellular calcium on osteoblast viability under iron-overloaded conditions. PLoS One 2020;15(5):e0234009.	12/1	2020
	Srikuea R, Hirunsai M, **Charoenphandhu N**. Regulation of vitamin D system in skeletal muscle and resident myogenic stem cell during development, maturation, and ageing. Sci Rep. 2020;10(1):8239.	12/1	2020
	Jantarajit W, Wongdee K, Lertsuwan K, Teerapornpuntakit J, Aeimlapa R, Thongbunchoo J, Harvey BSJ, Sheppard DN, **Charoenphandhu N**. Parathyroid hormone increases CFTR expression and function in Caco-2 intestinal epithelial cells. Biochem Biophys Res Commun. 2020;523(3):816-21.	12/1	2020
	Wongdee K, Lertsuwan K, Thonapan N, Teerapornpuntakit J, **Charoenphandhu N**. Differential expression of Sox9 protein and	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	proteoglycans in the epiphyseal cartilage of bromocriptine-treated pregnant and lactating rats. Anat Sci Int. 2020;95(2):277-85.		
	Eaimworawuthikul S, Tunapong W, Chunchai T, Suntornsaratoon P, **Charoenphandhu N**, Thiennimitr P, et al. Altered gut microbiota ameliorates bone pathology in the mandible of obese-insulin-resistant rats. Eur J Nutr. 2020;59(4):1453-62.	12/1	2020
	Charoenphandhu N, Aeimlapa R, Sooksawanwit S, Thongbunchoo J, Teerapornpuntakit J, Svasti S, Wongdee K. Responses of primary osteoblasts and osteoclasts from hemizygous ß-globin knockout thalassemic mice with elevated plasma glucose to 1,25-dihydroxyvitamin D3. Sci Rep. 2019;9(1):13963.	12/1	2019
	Tiyasatkulkovit W, Promruk W, Rojviriya C, Pakawanit P, Chaimongkolnukul K, Kengkoom K, Teerapornpuntakit J, Panupinthu N, **Charoenphandhu N**. Impairment of bone microstructure and upregulation of osteoclastogenic markers in spontaneously hypertensive rats. Sci Rep. 2019;9(1):12293.	12/1	2019
	Aeimlapa R, Wongdee K, Tiyasatkulkovit W, Kengkoom K, Krishnamra N, **Charoenphandhu N**. Anomalous bone changes in ovariectomized type-2 diabetic rats: inappropriately low bone turnover with bone loss in an estrogen-deficient condition. Am J Physiol Endocrinol Metab. 2019;317(4):E646-E57.	12/1	2019
	Wongdee K, Rodrat M, Teerapornpuntakit J, Krishnamra N, **Charoenphandhu N**. Factors	12/1	2019

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	inhibiting intestinal calcium absorption: hormones and luminal factors that prevent excessive calcium uptake. J Physiol Sci. 2019;69(5):683-96.		
	Eaimworawuthikul S, Tunapong W, Chunchai T, Suntornsaratoon P, **Charoenphandhu N**, Thiennimitr P, Chattipakorn N, Chattipakorn S. Lactobacillus paracasei HII01, xylooligosaccharide and synbiotics improve tibial microarchitecture in obese-insulin resistant rats. J Funct Foods. 2019;59:371-9.	12/1	2019
	Khuituan P, K-da S, Bannob K, Hayeeawaema F, Peerakietkhajorn S, Tipbunjong C, Wichienchot S, **Charoenphandhu N**. Prebiotic oligosaccharides from dragon fruits alter gut motility in mice. Biomed Pharmacother. 2019;114.	12/1	2019
	Eaimworawuthikul S, Tunapong W, Chunchai T, Yasom S, Wanchai K, Suntornsaratoon P, **Charoenphandhu N**, Thiennimitr P, Chattipakorn N, Chattipakorn S. Effects of probiotics, prebiotics or synbiotics on jawbone in obese-insulin resistant rats. Eur J Nutr. 2019;58(7):2801–2810.	12/1	2019
	Tithito T, Suntornsaratoon P, **Charoenphandhu N**, Thongbunchoo J, Krishnamra N, Tang IM, Pon-On W. Fabrication of biocomposite scaffolds made with modified hydroxyapatite inclusion of chitosan-grafted-poly(methyl methacrylate) for bone tissue engineering. Biomed Mater. 2019;14(2).	12/1	2019

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Thiengwittayaporn S, Phatwong S, Kangkano N, **Charoenphandhu N**. Efficacy of triamcinolone injection with or without oral meloxicam for treatment of anserine syndrome: a randomized, double-blind, placebo-controlled trial. Mltj-Muscle Ligament. 2019;9(1):138-44.	12/1	2019

Current Teaching Load

1	SCPS 101 Health and Wellness	2(2-0-0)
2	SCPS 202 Basic Physiology	3(2-3-5)
3	SCBM 261 Physiology for Medical Science I	2(2-0-4)
4	SCBM 262 Physiology for Medical Science II	2(2-0-4)
5	SCBM 263 Physiology for Medical Science III	3(3-0-6)
6	SCID 112 Introduction to Research	1(1-0-2)
7	SCID 221 Cardiovascular System I	3(2-2-5)
8	SCID 222 Cardiovascular System II	2(2-0-4)
9	SCID 223 Respiratory System	4(3-2-7)
10	SCID 224 Renal and Urinary System	3(3-0-6)
11	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
12	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
13	SCID 311 Gastrointestinal and Hepatobiliary System	3(2-2-5)
14	SCID 313 Endocrine System	3(3-0-6)
15	SCPS 606 Physiology Seminar I	1(1-0-2)
16	SCPS 607 Physiology Seminar II	1(1-0-2)
17	SCPS 608 Physiology Seminar III	1(1-0-2)
18	SCPS 623 Neurophysiology	2(2-0-4)
19	SCPS 630 Scientific Paper Analysis	1(0-2-1)
20	SCPS 639 Laboratory Teaching in Physiology	1(0-3-1)
21	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
22	SCPS 677 Seminar in Physiology IV	1(1-0-2)
23	SCPS 678 Scientific Writing and Communication	1(0-3-0)
24	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
25	SCSP 680 Systems Physiology I	3(3-0-6)
26	SCSP 681 Systems Physiol ogy II	3(3-0-6)
27	SCPS 682 Professional Communication Skills	1(1-0-2)

28	SCPS 698 Thesis	12(0-36-0)
29	SCPS 699 Dissertation	36(0-108-0)
30	SCPS 799 Dissertation	48(0-144-0)
31	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

3. Name: Associate Professor Dr. Arthit Chairoungdua

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Medial Science	Kyorin University School of Medicine, Japan	2003
M.Sc.	Toxicology	Mahidol University	1998
B.N.S.	Nursing Science	Khon Kaen University	1993

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Study on roles of extracellular vesicles as modulators of cell-to-cell communication in health and disease
2. Anticancer drug development from natural resources

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Hasan H, Sohal IS*, Soto-Vargas Z, Byappanhalli AM, Humphrey SE, Kubo H, Kitdumrongthum S, Copeland S, Tian F, **Chairoungdua A**, Kasinski AL. Extracellular vesicles released by non-small cell lung cancer cells drive invasion and permeability in non-tumorigenic lung epithelial cells. Sci Rep 2022 Jan;12:972.	12/1	2022
	Maijaroen S, Klaynongsruang S, Reabroi S, **Chairoungdua A**, Roytrakul S, Daduang J, Taemaitree L, Jangpromma N*. Proteomic profiling reveals antitumor effects of RT2 peptide on a human colon carcinoma xenograft mouse model. Eur J Pharmacol 2022 Feb;917:174753.	12/1	2022

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Moe TS, Chaturonrutsamee S, Bunteang S, Kuhakarn C, Prabpai S, Surawatanawong P, **Chairoungdua A**, Suksen K, Akkarawongsapat R, Limthongkul J, Napaswad C, Nuntasaen N, Reutrakul V*. Boesenmaxane diterpenoids from Boesenbergia maxwellii. J Nat Prod 2021 Feb;84(2):518-26.	12/1	2021
	Sukbangnop W, Hosen A, Hongthong S, Kuhakarn C, Tuchinda P, Chaturonrutsamee S, Thanasansurapong S, Akkarawongsapat R, Limthongkul J, Napaswad C, **Chairoungdua A**, Suksen K, Nuntasaen N, Reutrakul V*. Bioactive tetrahydrofuran lignans from roots, stems, leaves and twigs of Anogeissus rivularis. Fitoterapia 2021 Jun;151:104885.	12/1	2021
	Silalai P, Pruksakorn D, **Chairoungdua A**, Suksen K, Saeeng R*. Synthesis of propargylamine mycophenolate analogues and their selective cytotoxic activity towards neuroblastoma SH-SY5Y cell line. Bioorg Med Chem Lett 2021 Aug;45:128135.	12/1	2021
	Bunthawong R, Sirion U, **Chairoungdua A**, Suksen K, Piyachaturawat P, Suksamrarn A, Saeeng R*. Synthesis and cytotoxic activity of new 7-acetoxy-12-amino-14-deoxy andrographolide analogues. Bioorg Med Chem Lett 2021 Feb;33:127741.	12/1	2021
	Arsakhant P, Sirion U, **Chairoungdua A**, Suksen K, Piyachaturawat P, Suksamrarn A, Saeeng R*. Design and synthesis of C-12 dithiocarbamate andrographolide analogues as an anticancer agent. Bioorg Med Chem Lett 2020 Jul;30(14):127263.	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Jaitheerapapkul S, Kuhakarn C, Hongthong S, Anantachoke N, Thanasansurapong S, **Chairoungdua A**, Suksen K, Nuntasaen N, Reutrakul V*. Lanostane derivatives from the leaves and twigs of Garcinia wallichii. Phytochem Lett 2020 Aug;38:101-6.	12/1	2020
	Kangboonruang K, Wongtrakoongate P, Lertsuwan K, Khachonkham S, Changkaew P, Tangboonduangjit P, Siripoon T, Ngamphaiboon N, **Chairoungdua A***. MALAT1 decreases the sensitivity of head and neck squamous cell carcinoma cells to radiation and cisplatin. Anticancer Res 2020;40(5):2645-55.	12/1	2020
	Kitdumrongthum S, Reabroi S, Suksen K, Tuchinda P, Munyoo B, Mahalapbutr P, Rungrotmongkol T, Ounjai P, **Chairoungdua A***. Inhibition of topoisomerase II**α** and induction of DNA damage in cholangiocarcinoma cells by altholactone and its halogenated benzoate derivatives. Biomed Pharmacother 2020 Jul;127:110149.	12/1	2020
	Silalai P, Sirion U, Piyachaturawat P, **Chairoungdua A**, Suksen K, Saeeng R*. Design, synthesis and evaluations of new 10-triazolyl-1-methoxygenipin analogues for their cytotoxicity to cancer cells. ChemistrySelect 2020 Aug;5(30):9540-6.	12/1	2020
	Sonpho E, Wootthichairangsan C, Ishida M, Inoue T, Agata K, Maleehuan A, Charngkaew K, Chomanee N, Moonsom S, Wongtrakoongate P, **Chairoungdua A**, Ounjai P*. ECM-body: A cell-free 3D biomimetic	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	scaffold derived from intact planarian body. Zool Sci 2020 Aug;37(4):307-13.		
	Thanasansurapong S, Tuchinda P*, Reutrakul V, Pohmakotr M, Piyachaturawat P, **Chairoungdua A**, Suksen K, Akkarawongsapat R, Limthongkul J, Napaswad C, Nuntasaen N. Cytotoxic and anti-HIV-1 activities of triterpenoids and flavonoids isolated from leaves and twigs of Gardenia sessiliflora. Phytochem Lett 2020 Feb;35:46-52.	12/1	2020
	Mazumder A, Assawapanumat W, Dwivedi A, Reabroi S, **Chairoungdua A**, Nasongkla N*. Glucose targeted therapy against liver hepatocellular carcinoma: In vivo study. J Drug Deliv Sci Technol 2019 Feb;49:502-12.	12/1	2019

Current Teaching Load

1	SCPS 101 Health and Wellness	2(2-0-0)
2	SCPS 202 Basic Physiology	3(2-3-5)
3	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
4	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
5	SCID 313 Endocrine System	3(3-0-6)
6	SCPS 606 Physiology Seminar I	1(1-0-2)
7	SCPS 607 Physiology Seminar II	1(1-0-2)
10	SCPS 608 Physiology Seminar III	1(1-0-2)
11	SCPS 630 Scientific Paper Analysis	1(0-2-1)
12	SCPS 677 Seminar in Physiology IV	1(1-0-2)
13	SCPS 678 Scientific Writing and Communication	1(0-3-0)
14	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
15	SCSP 680 Systems Physiology I	3(3-0-6)
16	SCSP 681 Systems Physiology II	3(3-0-6)
17	SCPS 682 Professional Communication Skills	1(1-0-2)
18	SCPS 698 Thesis	12(0-36-0)
19	SCPS 699 Dissertation	36(0-108-0)

20	SCPS 799 Dissertation	48(0-144-0)
21	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

4. Name: Associate Professor Dr. Jittima Weerachayaphorn

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Cellular Physiology and Molecular Biophysics	University of Texas Medical Branch at Galveston, USA	2007
M.Sc.	Physiology	Mahidol University	2001
B.Sc.	Nursing Science	Mahidol University	1995

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Pathophysiologic mechanisms underlying mechanisms of cholestasis
2. Mechanisms and effects of calcium signals in hepatocytes and cholangiocytes
3. Molecular regulation of cholestasis in cholangiocytes
4. Role of inositol 1,4,5-trisphosphate receptors in cholestatic liver disease and alcoholic hepatitis

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Takeuchi M, Vidigal PT, Guerra MT, Hundt MA, Robert ME, Olave-Martinez M, Aoki S, Khamphaya T, Kersten R, Kruglov E, Rodriguez RD, Banales JM, Nathanson MH*, **Weerachayaphorn J***. Neutrophils interact with cholangiocytes to cause cholestatic changes in alcoholic hepatitis. Gut 2021 Jan;70(2):342-56.	12/1	2021
	Sutjarit N, Thongon N, **Weerachayaphorn J**, Piyachaturawat P, Suksamrarn A, Suksen K, Papachristou DJ, Blair HC*. Inhibition of Adipogenic Differentiation of Human Bone	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Marrow-Derived Mesenchymal Stem Cells by a Phytoestrogen Diarylheptanoid from *Curcuma comosa*. J Agric Food Chem 2020 Sep 16;68(37):9993-10002.		
	Buniam J, Chukijrungroat N, Rattanavichit Y, Surapongchai J, **Weerachayaphorn J**, Bupha-Intr T, Saengsirisuwan V*. 20-hydroxyecdysone ameliorates metabolic and cardiovascular dysfunction in high-fathigh-fructose-fed ovariectomized rats. BMC Compl Med Therapies 2020 May;20(1):140.	12/1	2020
	Ueasilamongkol P, Khamphaya T, Guerra MT, Rodrigues MA, Gomes DA, Kong Y, Wei W, Jain D, Trampert DC, Ananthanarayanan M, Banales JM, Roberts LR, Farshidfar F, Nathanson MH, **Weerachayaphorn J**. Type 3 Inositol 1,4,5-Trisphosphate Receptor Is Increased and Enhances Malignant Properties in Cholangiocarcinoma. Hepatology (Baltimore, Md). 2020;71(2):583-99.	12/1	2020
	Buniam J, Chukijrungroat N, Khamphaya T, **Weerachayaphorn J**, Saengsirisuwan V*. Estrogen and voluntary exercise attenuate cardiometabolic syndrome and hepatic steatosis in ovariectomized rats fed a high-fat high-fructose diet. Am J Physiol Endocrinol Metab 2019 May;316(5):E908-E921.	12/1	2019
	Franca A, Carlos Melo Lima Filho A, Guerra MT, **Weerachayaphorn J**, Loiola dos Santos M, Njei B, Robert M, Xavier Lima C, Vieira Teixeira Vidigal P, Banales JM, Ananthanarayanam M, Fatima Leite M, Nathanson MH. Effects of endotoxin on type 3 inositol 1,4,5-trisphosphate receptor in human	12/1	2019

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	cholangiocytes. Hepatology 2019 Feb;69(2):817-30.		

Current Teaching Load

1	SCPS 101 Health and Wellness	2(2-0-0)
2	SCPS 202 Basic Physiology	3(2-3-5)
3	SCBM 261 Physiology for Medical Science I	2(2-0-4)
4	SCBM 262 Physiology for Medical Science II	2(2-0-4)
5	SCBM 263 Physiology for Medical Science III	3(3-0-6)
6	SCID 112 Introduction to Research	1(1-0-2)
7	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
8	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
9	SCID 221 Cardiovascular System I	3(2-2-5)
10	SCID 222 Cardiovascular System II	2(2-0-4)
11	SCID 223 Respiratory System	4(3-2-7)
12	SCID 224 Renal and Urinary System	3(3-0-6)
13	SCID 311 Gastrointestinal and Hepatobiliary System	3(2-2-5)
14	SCID 313 Endocrine System	3(3-0-6)
15	SCPS 606 Physiology Seminar I	1(1-0-2)
16	SCPS 607 Physiology Seminar II	1(1-0-2)
17	SCPS 608 Physiology Seminar III	1(1-0-2)
18	SCPS 623 Neurophysiology	2(2-0-4)
19	SCPS 630 Scientific Paper Analysis	1(0-2-1)
20	SCPS 639 Laboratory Teaching in Physiology	1(0-3-1)
21	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	2(2-0-4)
22	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
23	SCPS 677 Seminar in Physiology IV	1(1-0-2)
24	SCPS 678 Scientific Writing and Communication	1(0-3-0)
25	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
26	SCSP 680 Systems Physiology I	3(3-0-6)
27	SCSP 681 Systems Physiology II	3(3-0-6)

28	SCPS 682 Professional Communication Skills	1(1-0-2)
29	SCPS 698 Thesis	12(0-36-0)
30	SCPS 699 Dissertation	36(0-108-0)
31	SCPS 799 Dissertation	48(0-144-0)
32	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

5. Name: Associate Professor Dr. Ratchakrit Srikuea

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Exercise Science	Mahidol University	2010
M.Sc.	Sports Science	Mahidol University	2004
B.Sc.	Sports Science	Mahidol University	2000

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Skeletal Muscle Physiology
2. Exercise Physiology

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Puangthong C, Sukhong P, Saengnual P, **Srikuea R**, Chanda M. A single bout of high-intensity exercise modulates the expression of vitamin D receptor and vitamin D-metabolising enzymes in horse skeletal muscle. Equine Vet J. 2021;53(4):796-805.	12/1	2021
	Hirunsai M*, **Srikuea R**. Autophagy-lysosomal signaling responses to heat stress in tenotomy-induced rat skeletal muscle atrophy. Life Sci 2021 Jun;275:119352.	12/1	2021
	Srikuea R*, Hirunsai M, Charoenphandhu N. Regulation of vitamin D system in skeletal muscle and resident myogenic stem cell during development, maturation, and ageing. Sci Rep 2020 May;10(1):8239.	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Hirunsai M*, **Srikuea R**. Heat stress ameliorates tenotomy-induced inflammation in muscle-specific response via regulation of macrophage subtypes. J Appl Physiol 2020 Mar;128(3):612-26.	12/1	2020

Current Teaching Load

1	SCPS 202 Basic Physiology	3(2-3-5)
2	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
3	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
4	SCID 221 Cardiovascular System I	3(2-2-5)
5	SCID 222 Cardiovascular System II	2(2-0-4)
6	SCID 223 Respiratory System	4(3-2-7)
7	SCID 224 Renal and Urinary System	3(3-0-6)
8	SCID 311 Gastrointestinal and Hepatobiliary System	3(2-2-5)
9	SCID 313 Endocrine System	3(3-0-6)
10	SCPS 606 Physiology Seminar I	1(1-0-2)
11	SCPS 607 Physiology Seminar II	1(1-0-2)
12	SCPS 608 Physiology Seminar III	1(1-0-2)
13	SCPS 630 Scientific Paper Analysis	1(0-2-1)
14	SCPS 661 Physical Fitness Testing and Exercise Prescription	3(2-2-5)
15	SCPS 663 Practicum in Exercise for Health	3(1-4-4)
16	SCPS 666 Neuromuscular Exercise Physiology	2(2-0-4)
17	SCPS 669 Clinical Exercise Physiology	2(2-0-4)
18	SCPS 670 Professional Skills for Exercise Physiologist	2(2-0-4)
19	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
20	SCPS 673 Seminar in Advanced Exercise Physiology I	1(1-0-2)
21	SCPS 674 Seminar in Advanced Exercise Physiology II	1(1-0-2)
22	SCPS 675 Molecular Exercise Physiology	2(2-0-4)
23	SCPS 677 Seminar in Physiology IV	1(1-0-2)
24	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
25	SCPS 680 Systems Physiology I	3(3-0-6)
26	SCPS 698 Thesis	12(0-36-0)
27	SCPS 699 Dissertation	36(0-108-0)
28	SCPS 799 Dissertation	48(0-144-0)

29	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

6. Name: Associate Professor Dr. Sunhapas Soodvilai

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Physiology	Mahidol University	2005
B.Pharm	Pharmacy	Ubon Ratchathani University	2000

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Renal Physiology
2. Regulation of drug transporters and Ion channels
3. Drug-induced nephrotoxicity
4. Role of nuclear receptors in cancer development

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Chabang N, **Soodvilai S**, Munyoo B, Tuchinda P, Soodvilai S*. Modified cycloartanes with improved inhibitory effect on SGLT-mediated glucose uptake in human renal proximal tubular cells. ScienceAsia 2021 Apr;47(2):170-7.	12/1	2021
	Pasachan T, Duangjai A, Ontawong A, Amornlerdpison D, Jinakote M, Phatsara M, **Soodvilai S**, Srimaroeng C*. Tiliacora triandra (Colebr.) Diels leaf aqueous extract inhibits hepatic glucose production in HepG2 cells and type 2 diabetic rats. Molecules 2021 Feb;26(5):1239.	12/1	2021
	Jinakote M, Ontawong A, **Soodvilai S**, Pimta J, Pasachan T, Chatsudthipong V, Srimaroeng C*. High affinity of 4-(4-(dimethylamino)styryl)-*N*-methylpyridinium transport for assessing	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	organic cation drugs in hepatocellular carcinoma cells. Fundam Clin Pharmacol 2020 Jun;34(3):365-79.		
	Wang F*, Luo R*, Peng K, Liu X, Xu C, Lu X, **Soodvilai S**, Yang T. Soluble (pro)renin receptor regulation of ENaC involved in aldosterone signaling in cultured collecting duct cells. Am J Physiol Renal Physiol 2020 Mar;318(3):F817-F25.	12/1	2020
	Wongwan T, Chatsudthipong V, **Soodvilai S**. Farnesoid X Receptor Activation Stimulates Organic Cations Transport in Human Renal Proximal Tubular Cells. Int J Mol Sci. 2020 Aug 24;21(17):6078.	12/1	2020
	Benchamana A, Mori H, MacDougald OA, **Soodvilai S***. Regulation of adipocyte differentiation and metabolism by lansoprazole. Life Sci 2019 Dec;239:116897.	12/1	2019
	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 2019 Jun;24(8):927-34.	12/1	2019

Current Teaching Load

1	SCPS 101 Health and Wellness	2(2-0-0)
2	SCPS 202 Basic Physiology	3(2-3-5)
3	SCBM 261 Physiology for Medical Science I	2(2-0-4)
4	SCBM 262 Physiology for Medical Science II	2(2-0-4)
5	SCBM 263 Physiology for Medical Science III	3(3-0-6)
6	SCID 112 Introduction to Research	1(1-0-2)
7	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)

8	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
9	SCID 221 Cardiovascular System I	3(2-2-5)
10	SCID 222 Cardiovascular System II	2(2-0-4)
11	SCID 223 Respiratory System	4(3-2-7)
12	SCID 224 Renal and Urinary System	3(3-0-6)
13	SCID 311 Gastrointestinal and Hepatobiliary System	3(2-2-5)
14	SCID 313 Endocrine System	3(3-0-6)
15	SCPS 606 Physiology Seminar I	1(1-0-2)
16	SCPS 607 Physiology Seminar II	1(1-0-2)
17	SCPS 608 Physiology Seminar III	1(1-0-2)
18	SCPS 623 Neurophysiology	2(2-0-4)
19	SCPS 630 Scientific Paper Analysis	1(0-2-1)
20	SCPS 639 Laboratory Teaching in Physiology	1(0-3-1)
21	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	2(2-0-4)
22	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
23	SCPS 677 Seminar in Physiology IV	1(1-0-2)
24	SCPS 678 Scientific Writing and Communication	1(0-3-0)
25	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
26	SCSP 680 Systems Physiology I	3(3-0-6)
27	SCSP 681 Systems Physiology II	3(3-0-6)
28	SCPS 682 Professional Communication Skills	1(1-0-2)
29	SCPS 698 Thesis	12(0-36-0)
30	SCPS 699 Dissertation	36(0-108-0)
31	SCPS 799 Dissertation	48(0-144-0)
32	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

7. Name: Associate Professor Dr. Tepmanas Bupha-Intr

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Physiology	Mahidol University	2005
D.V.M.	Veterinary Medicine	Chulalongkorn University	1998

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Cardiac muscle physiology and sex hormones
2. Role of antioxidant in the heart
3. Cardiac inflammation
4. Cardiac autonomic function in sport and exercise

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Kampaengsri T, Ponpuak M, Wattanapermpool J, **Bupha-Intr T***. Deficit of female sex hormones desensitizes rat cardiac mitophagy. Chin J Physiol 2021 Apr;64(2):72-9.	12/1	2021
	Buniam J, Chukijrungroat N, Rattanavichit Y, Surapongchai J, Weerachayaphorn J, **Bupha-Intr T**, Saengsirisuwan V*. 20-hydroxyecdysone ameliorates metabolic and cardiovascular dysfunction in high-fathigh-fructose-fed ovariectomized rats. BMC Compl Med Therapies 2020 May;20(1):140.	12/1	2020
	Phungphong S, Kijtawornrat A, Kampaengsri T, Wattanapermpool J, **Bupha-Intr T***. Comparison of exercise training and estrogen supplementation on mast cell-mediated doxorubicin-induced cardiotoxicity. Am J	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Physiol Regul Integr Comp Physiol 2020 May;318(5):R829-R42.		
	Phungphong S, Kijtawornrat A, Wattanapermpool J, **Bupha-Intr T***. Improvement in cardiac function of ovariectomized rats by antioxidant tempol. Free Radic Biol Med 2020 Nov;160:239-45.	12/1	2020
	Wadthaisong M, Wattanapermpool J, de Tombe PP, **Bupha-Intr T***. Suppression of myofilament cross-bridge kinetic in the heart of orchidectomized rats. Life Sci 2020 Nov;261:118342.	12/1	2020
	Jitmana R, Raksapharm S, Kijtawornrat 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 Feb;219:209-18.	12/1	2019
	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 Feb;316(2):H360-H70.	12/1	2019
	Wadthaisong M, Witayavanitkul N, **Bupha-Intr T**, Wattanapermpool J, de Tombe PP*. Chronic high-dose testosterone treatment: impact on rat cardiac contractile biology. Physiol Rep 2019 Jul;7(14):e14192.	12/1	2019

Current Teaching Load

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

2	SCPS 202 Basic Physiology	3(2-3-5)
3	SCBM 262 Physiology for Medical Science II	2(2-0-4)
4	SCID 112 Introduction to Research	1(1-0-2)
5	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
6	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
7	SCID 221 Cardiovascular System I	3(2-2-5)
8	SCID 222 Cardiovascular System II	2(2-0-4)
9	SCID 223 Respiratory System	4(3-2-7)
10	SCID 224 Renal and Urinary System	3(3-0-6)
11	SCID 311 Gastrointestinal and Hepatobiliary System	3(2-2-5)
12	SCID 313 Endocrine System	3(3-0-6)
13	SCPS 606 Physiology Seminar I	1(1-0-2)
14	SCPS 607 Physiology Seminar II	1(1-0-2)
15	SCPS 608 Physiology Seminar III	1(1-0-2)
16	SCPS 630 Scientific Paper Analysis	1(0-2-1)
17	SCPS 639 Laboratory Teaching in Physiology	1(0-3-1)
18	SCPS 661 Physical Fitness Testing and Exercise Prescription	3(2-2-5)
19	SCPS 667 Cardiorespiratory Responses to Exercise and Environmental Stress	2(2-0-4)
20	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	2(2-0-4)
21	SCPS 670 Professional Skills for Exercise Physiologist	2(2-0-4)
22	SCPS 671 Foundations of Strength Training and Conditioning	1(1-0-2)
23	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
24	SCPS 677 Seminar in Physiology IV	1(1-0-2)
25	SCPS 678 Scientific Writing and Wommunication	1(0-3-0)
26	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
27	SCSP 680 Systems Physiology I	3(3-0-6)
28	SCSP 681 Systems Physiology II	3(3-0-6)
29	SCPS 698 Thesis	12(0-36-0)
30	SCPS 699 Dissertation	36(0-108-0)
31	SCPS 799 Dissertation	48(0-144-0)
32	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)

5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

8. Name: Associate Professor Dr. Vitoon Saengsirisuwan

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Physiological Sciences	University of Arizona, USA	2003
M.Sc.	Exercise Physiology	Mahidol University	1995
B.Sc.	Physical Therapy	Mahidol University	1993

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Role of exercise in cardiometabolic syndrome
2. Study of sex difference in the development of metabolic dysfunction
3. Study of neuromuscular control in human body movement

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Surapongchai J*, **Saengsirisuwan V**, Rollo I, Randell RK, Nithitsuttibuta K, Sainiyom P, Leow CHW, Lee JKW. Hydration status, fluid intake, sweat rate, and sweat sodium concentration in recreational tropical native runners. Nutrients 2021 Apr;13(4):1374.	12/1	2021
	Buniam J, Chukijrungroat N, Rattanavichit Y, Surapongchai J, Weerachayaphorn J, Bupha-Intr T, **Saengsirisuwan V***. 20-hydroxyecdysone ameliorates metabolic and cardiovascular dysfunction in high-fathigh-fructose-fed ovariectomized rats. BMC Compl Med Therapies 2020 May;20(1):140.	12/1	2020
	Pumpho A, Chaikeeree N, **Saengsirisuwan V**, Boonsinsukh R*. Selection of the better dual-timed up and go cognitive task to be used in	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	patients with stroke characterized by subtraction operation difficulties. Front Neurol 2020 Apr;11:262.		
	Buniam J, Chukijrungroat N, Khamphaya T, Weerachayaphorn J, **Saengsirisuwan V***. Estrogen and voluntary exercise attenuate cardiometabolic syndrome and hepatic steatosis in ovariectomized rats fed a high-fat high-fructose diet. Am J Physiol Endocrinol Metab 2019 May;316(5):E908-E921.	12/1	2019
	Jitmana R, Raksapharm S, Kijtawornrat 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 Feb;219:209-18.	12/1	2019
	Prasannarong M*, **Saengsirisuwan V**, Surapongchai J, Buniam J, Chukijrungroat N, Rattanavichit Y. Rosmarinic acid improves hypertension and skeletal muscle glucose transport in angiotensin II-treated rats. BMC Complement Altern Med 2019 Jul 8;19(1):165.	12/1	2019
	Winairuk T, Pang MYC, **Saengsirisuwan V**, Horak FB, Boonsinsukh R*. Comparison of measurement properties of three shortened versions of the balance evaluation system test (BESTest) in people with subacute stroke. J Rehabil Med 2019 Sep;51(9):683-91.	12/1	2019

Current Teaching Load

1	SCPS 202 Basic Physiology	3(2-3-5)
2	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
3	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
4	SCID 221 Cardiovascular System I	3(2-2-5)
5	SCID 222 Cardiovascular System II	2(2-0-4)

6	SCID 223 Respiratory System	4(3-2-7)
7	SCID 224 Renal and Urinary System	3(3-0-6)
8	SCID 311 Gastrointestinal and Hepatobiliary System	3(2-2-5)
9	SCID 313 Endocrine System	3(3-0-6)
10	SCPS 606 Physiology Seminar I	1(1-0-2)
11	SCPS 607 Physiology Seminar II	1(1-0-2)
12	SCPS 608 Physiology Seminar III	1(1-0-2)
13	SCPS 630 Scientific Paper Analysis	1(0-2-1)
14	SCPS 661 Physical Fitness Testing and Exercise Prescription	3(2-2-5)
15	SCPS 667 Cardiorespiratory Responses to Exercise and Environmental Stress	2(2-0-4)
16	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	2(2-0-4)
17	SCPS 669 Clinical Exercise Physiology	2(2-0-4)
18	SCPS 670 Professional Skills for Exercise Physiologist	2(2-0-4)
19	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
20	SCPS 677 Seminar in Physiology IV	1(1-0-2)
21	SCPS 678 Scientific Writing and Communication	1(0-3-0)
22	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
23	SCSP 680 Systems Physiology I	3(3-0-6)
24	SCPS 698 Thesis	12(0-36-0)
25	SCPS 699 Dissertation	36(0-108-0)
26	SCPS 799 Dissertation	48(0-144-0)
27	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional communication skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

9. Name: Assistant Professor Dr. Nattapon Panupinthu, MD.

Education

Degree	Degree Name	Institute	Year of Graduation
M.D.	Medicine	Mahidol University	2018
Ph.D.	Physiology	The University of Western Ontario, Canada	2008
B.Sc.	Medical Science	Mahidol University	2001

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Basic and translational research of calcium and bone metabolism
2. Mechanobiology of the musculoskeletal system
3. Preclinical imaging modalities for small animals in biomedical research

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Tiyasatkulkovit W, Aksornthong S, Adulyaritthikul P, Upanan P, Wongdee K, Aeimlapa R, Teerapornpuntakit J, Rojviriya C, **Panupinthu N**, Charoenphandhu N. Excessive salt consumption causes systemic calcium mishandling and worsens microarchitecture and strength of long bones in rats. Scientific reports. 2021;11(1):1850.	12/1	2021
	Tiyasatkulkovit W, Promruk W, Rojviriya C, Pakawanit P, Chaimongkolnukul K, Kengkoom K, Teerapornpuntakit J, **Panupinthu N**, Charoenphandhu N*. Impairment of bone microstructure and upregulation of osteoclastogenic markers in spontaneously hypertensive rats. Sci Rep 2019 Aug;9:12293.	12/1	2019

Current Teaching Load

1	SCPS 101 Health and Wellness	2(2-0-0)
2	SCPS 202 Basic Physiology	3(2-3-5)
3	SCBM 261 Physiology for Medical Science I	2(2-0-4)
4	SCBM 262 Physiology for Medical Science II	2(2-0-4)
5	SCBM 263 Physiology for Medical Science III	3(3-0-6)
6	SCID 112 Introduction to Research	1(1-0-2)
7	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
8	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
9	SCID 221 Cardiovascular System I	3(2-2-5)
10	SCID 222 Cardiovascular System II	2(2-0-4)
11	SCID 223 Respiratory System	4(3-2-7)
12	SCID 224 Renal and Urinary System	3(3-0-6)
13	SCID 311 Gastrointestinal and Hepatobiliary System	3(2-2-5)
14	SCID 313 Endocrine System	3(3-0-6)
15	SCPS 606 Physiology Seminar I	1(1-0-2)
16	SCPS 607 Physiology Seminar II	1(1-0-2)
17	SCPS 608 Physiology Seminar III	1(1-0-2)
18	SCPS 623 Neurophysiology	2(2-0-4)
19	SCPS 630 Scientific Paper Analysis	1(0-2-1)
20	SCPS 639 Laboratory Teaching in Physiology	1(0-3-1)
21	SCPS 666 Neuromuscular Exercise Physiology	2(2-0-4)
22	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	2(2-0-4)
23	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
24	SCPS 677 Seminar in Physiology IV	1(1-0-2)
25	SCPS 678 Scientific Writing and Communication	1(0-3-0)
26	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
27	SCSP 680 Systems Physiology I	3(3-0-6)
28	SCSP 681 Systems Physiology II	3(3-0-6)
29	SCPS 682 Professional Communication Skills	1(1-0-2)
30	SCPS 698 Thesis	12(0-36-0)
31	SCPS 699 Dissertation	36(0-108-0)
32	SCPS 799 Dissertation	48(0-144-0)
33	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)

3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

9. Name: Assistant Professor Dr. Witchuda Saengsawang

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Physiology and Biophysics	University of Illinois at Chicago, USA	2008
B.Pharm	Pharmacy	Mahidol University	2002

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Neuroinflammation and neurodegeneration; mechanisms and drug discovery
2. Microglia and brain vessel responses in neurodegeneration
3. Mental disorders and drug addiction

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Uppakara K, Jamornwan S, Duan LX, Yue KR, Sunrat C, Dent EW, Wan SB*, **Saengsawang W***. Novel α-lipoic acid/3-n-butylphthalide conjugate enhances protective effects against oxidative stress and 6-OHDA induced neuronal damage. ACS Chem Neurosci 2020 Jun;11(11):1634-42.	12/1	2020
	Chukaew P, Leow A, **Saengsawang W**, Rasenick MM. Potential depression and antidepressant-response biomarkers in human lymphoblast cell lines from treatment-responsive and treatment-resistant subjects: roles of SSRIs and omega-3 polyunsaturated fatty acids. Molecular psychiatry. 2020. (doi.org/10.1038/s41380-020-0724-6).	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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 Apr;112:108645.	12/1	2019

Current Teaching Load

1	SCPS 101 Health and Wellness	2(2-0-0)
2	SCPS 202 Basic Physiology	3(2-3-5)
3	SCBM 261 Physiology for Medical Science I	2(2-0-4)
4	SCBM 262 Physiology for Medical Science II	2(2-0-4)
5	SCBM 263 Physiology for Medical Science III	3(3-0-6)
6	SCID 112 Introduction to Research	1(1-0-2)
7	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
8	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
9	SCID 221 Cardiovascular System I	3(2-2-5)
10	SCID 222 Cardiovascular System II	2(2-0-4)
11	SCID 223 Respiratory System	4(3-2-7)
12	SCID 224 Renal and Urinary System	3(3-0-6)
13	SCID 311 Gastrointestinal and Hepatobiliary System	3(2-2-5)
14	SCID 313 Endocrine System	3(3-0-6)
15	SCPS 606 Physiology Seminar I	1(1-0-2)
16	SCPS 607 Physiology Seminar II	1(1-0-2)
17	SCPS 608 Physiology Seminar III	1(1-0-2)
18	SCPS 623 Neurophysiology	2(2-0-4)
19	SCPS 630 Scientific Paper Analysis	1(0-2-1)
20	SCPS 639 Laboratory Teaching in Physiology	1(0-3-1)
21	SCPS 666 Neuromuscular Exercise Physiology	2(2-0-4)
22	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
23	SCPS 677 Seminar in Physiology IV	1(1-0-2)
24	SCPS 678 Scientific Writing and Communication	1(0-3-0)
25	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
26	SCSP 680 Systems Physiology I	3(3-0-6)
27	SCSP 681 Systems Physiology II	3(3-0-6)
28	SCPS 682 Professional Communication Skills	1(1-0-2)

29	SCPS 698 Thesis	12(0-36-0)
30	SCPS 699 Dissertation	36(0-108-0)
31	SCPS 799 Dissertation	48(0-144-0)
32	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

11. Name: Lecturer Dr. Kanit Bhukhai

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Biotherapies and Biotechnologies	Sorbonne Paris Cité University - Paris Diderot University (Paris 7), France	2015
M.Sc.	Physiology	Mahidol University	2011
B.Sc.	Public Health	Mahidol University	2009

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Hematopoietic stem cells gene therapy
2. Vector development for gene therapy application
3. Signaling pathways involved in the regulation of erythropoiesis
4. Drug discovery: medicinal plants and hematopoiesis

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Cohen C, Coulon S, **Bhukhai K**, Neuraz A, Dussiot M, Fouquet G, Stang MBL, Flamant M, Vrtovsnik F, Hummel A, Knebelmann B, Mesnard L, Rondeau E, Maciel TT, Favale F, Casadevall N, Nguyen-Khoa T, Moutereau S, Legendre C, Benhamou M, Monteiro RC, Hermine O*, El Karoui K*, Moura IC. Erythrocytosis associated with IgA nephropathy. eBioMedicine 2022 Jan;75:103785.	12/1	2022
	Nii T, Konno K, Matsumoto M, **Bhukhai K**, Borwornpinyo S, Sakai K, Hongeng S, Sugiyama D*. The bioactive peptide SL-	12/1	2021

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	13R expands human umbilical cord blood hematopoietic stem and progenitor cells in vitro. Molecules 2021 Apr;26(7):1995.		
	Seephetdee C, Buasri N, **Bhukhai K**, Srisanga K, Manopwisedjaroen S, Lertjintanakit S, Phueakphud N, Pakiranay C, Kangwanrangsan N, Srichatrapimuk S, Kirdlarp S, Sungkanuparph S, Chutipongtanate S, Thitithanyanont A, Hongeng S, Wongtrakoongate P*. Mice immunized with the vaccine candidate hexapro spike produce neutralizing antibodies against SARS-CoV-2. Vaccines 2021 May;9(5):498.	12/1	2021

Current Teaching Load

1	SCPS 101 Health and wellness	2(2-0-0)
2	SCPS 202 Basic Physiology	3(2-3-5)
3	SCBM 263 Physiology for Medical Science III	3(3-0-6)
4	SCPS 606 Physiology Seminar I	1(1-0-2)
5	SCPS 607 Physiology Seminar II	1(1-0-2)
6	SCPS 608 Physiology Seminar III	1(1-0-2)
7	SCPS 630 Scientific Paper Analysis	1(0-2-1)
8	SCPS 639 Laboratory Teaching in Physiology	1(0-3-1)
9	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
10	SCPS 677 Seminar in Physiology IV	1(1-0-2)
11	SCPS 678 Scientific writing and communication	1(0-3-0)
12	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
13	SCSP 681 Systems Physiology II	3(3-0-6)
14	SCPS 682 Professional communication skills	1(1-0-2)
15	SCPS 698 Thesis	12(0-36-0)
16	SCPS 799 Dissertation	48(0-144-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional communication skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

12. Name: Lecturer Dr. Ioannis D. Papadimitriou

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Exercise Physiology	Victoria University, Australia	2018
M.Sc.	Exercise and Health	Aristotle University, Greece	2009
B.Sc.	Physical Education and Sports Science	Aristotle University, Greece	2002

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Sport Genetics
2. Exercise Physiology
3. The influence of genetics on force production and response to endurance exercise

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Harvey NR, Voisin S, Lea RA, Yan X, Benton MC, **Papadimitriou ID**, Jacques M, Haupt LM, Ashton KJ, Eynon N, Griffiths LR. Investigating the influence of mtDNA and nuclear encoded mitochondrial variants on high intensity interval training outcomes. Sci Rep. 2020 Jul 6;10(1):11089.	12/1	2020
	Papadimitriou ID, Eynon N, Yan X, Munson F, Jacques M, Kuang J, Voisin S, North KN, Bishop DJ*. A "human knockout" model to investigate the influence of the α-actinin-3 protein on exercise-induced mitochondrial adaptations. Sci Rep 2019 Sep;9(1):12688.	12/1	2019

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Williams CJ, Gurd BJ, Bonafiglia JT, Voisin S, Li Z, Harvey N, Croci I, Taylor JL, Gajanand T, Ramos JS, Fassett RG, Little JP, Francois ME, Hearon CM Jr, Sarma S, Janssen SLJE, Van Craenenbroeck EM, Beckers P, Cornelissen VA, Pattyn N, Howden EJ, Keating SE, Bye A, Stensvold D, Wisloff U, **Papadimitriou I**, Yan X, Bishop DJ, Eynon N, Coombes JS. A Multi-Center Comparison of O2peak Trainability Between Interval Training and Moderate Intensity Continuous Training. Frontiers in physiology. 2019;10:19.	12/1	2019
	Hiam D., Voisin S., Yan X., Landen S., Jacques M., **Papadimitriou I.**, Munson F., Byrnes E., Brennan-Speranza T., Levinger I., Eynon N. The association between bone mineral density gene variants and osteocalcin at baseline, and in response to exercise: The Gene SMART study. Bone (2019) 123 23-27	12/1	2019

Current Teaching Load

1	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
2	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
3	SCPS 101 Health and Wellness	2(2-0-0)
4	SCPS 661 Physical Fitness Testing and Exercise Prescription	3(2-2-5)
5	SCPS 666 Neuromuscular Exercise Physiology	2(2-0-4)
6	SCPS 667 Cardiorespiratory Responses to Exercise and Environmental Stress	2(2-0-4)
7	SCPS 670 Professional Skills for Exercise Physiologist	2(2-0-4)
8	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
9	SCPS 677 Seminar in Physiology IV	1(1-0-2)
10	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 699 Dissertation	36(0-108-0)
13	SCPS 799 Dissertation	48(0-144-0)

14	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

13. Lecturer Dr. Nittaya Boonmuen

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Physiology	Mahidol University	2016
B.Sc.	Physical Therapy	Chiang Mai University	2010

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Study of extracellular vesicle from natural products/ functional food
2. Theragnostic potential of extracellular vesicles in cancer and aged-related diseases
3. Discovery and development of new drugs from natural resources for cancers and aged related disease, i.e., Metabolic diseases

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Phunikom N, **Boonmuen N**, Kheolamai P, Suksen K, Manochantr S, Tantrawatpan C, Tantikanlayaporn D*. Andrographolide promotes proliferative and osteogenic potentials of human placenta-derived mesenchymal stem cells through the activation of Wnt/β-catenin signaling. Stem Cell Res Ther 2021 Apr;12(1):241.	12/1	2021
	Kaewkittikhun M, **Boonmuen N**, Kheolamai P, Manochantr S, Tantrawatpan C, Sutjarit N, Tantikanlayaporn D*. Andrographolide reduces lipid droplet accumulation in adipocytes derived from human bone marrow mesenchymal stem cells by suppressing regulators of adipogenesis. J Agric Food Chem 2021 Aug;69(32):9259-69.	12/1	2021

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Jearawuttanakul K, Khumkhrong P, Suksen K, Reabroi S, Munyoo B, Tuchinda P, Borwornpinyo S, **Boonmuen N**, Chairoungdua A. Cleistanthin A induces apoptosis and suppresses motility of colorectal cancer cells. European journal of pharmacology. 2020;889:173604.	12/1	2020

Current Teaching Load

1	SCPS 101 Health and Wellness	2(2-0-0)
2	SCPS 202 Basic Physiology	3(2-3-5)
3	SCBM 261 Physiology for Medical Science I	2(2-0-4)
4	SCBM 262 Physiology for Medical Science II	2(2-0-4)
5	SCBM 263 Physiology for Medical Science III	3(3-0-6)
6	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
7	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
8	SCPS 606 Physiology Seminar I	1(1-0-2)
9	SCPS 607 Physiology Seminar II	1(1-0-2)
10	SCPS 608 Physiology Seminar III	1(1-0-2)
11	SCPS 630 Scientific Paper Analysis	1(0-2-1)
12	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
13	SCPS 677 Seminar in Physiology IV	1(1-0-2)
14	SCPS 678 Scientific Writing and Communication	1(0-3-0)
15	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
16	SCSP 681 Systems Physiology II	3(3-0-6)
17	SCPS 698 Thesis	12(0-36-0)
18	SCPS 699 Dissertation	36(0-108-0)
19	SCPS 799 Dissertation	48(0-144-0)
20	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)
2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)

5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

14. Name: Lecturer Dr. Ratchaneevan Aeimlapa

Education

Degree	Degree Name	Institute	Year of Graduation
Ph.D.	Physiology	Mahidol University	2018
M.Sc.	Physiology	Mahidol University	2014
B.Sc.	Biology	Mahidol University	2011

Faculty/Institute/College

Department of Physiology, Faculty of Science, Mahidol University

Research Topics

1. Calcium and bone metabolism in type 2 diabetes mellitus
2. Thalassemic osteopathy
3. Microstructural analysis of bone

Academic work as not part of the study for degree certificate and published and disseminated in accordance with the stipulated criteria regarding academic rank appointment in five retrospective years

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
Published research work	Tiyasatkulkovit W, Aksornthong S, Adulyaritthikul P, Upanan P, Wongdee K, **Aeimlapa R**, et al. Excessive salt consumption causes systemic calcium mishandling and worsens microarchitecture and strength of long bones in rats. Scientific reports. 2021;11(1):1850.	12/1	2021
	Jantarajit W, Wongdee K, Lertsuwan K, Teerapornpuntakit J, **Aeimlapa R**, Thongbunchoo J, Harvey BSJ, Sheppard DN, Charoenphandhu N. Parathyroid hormone increases CFTR expression and function in Caco-2 intestinal epithelial cells. Biochem	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Biophys Res Commun 2020 Mar;523(3):816-821.		
	Charoenphandhu N, **Aeimlapa R**, Sooksawanwit S, Thongbunchoo J, Teerapornpuntakit J, Svasti S, Wongdee K. Responses of primary osteoblasts and osteoclasts from hemizygous ß-globin knockout thalassemic mice with elevated plasma glucose to 1,25-dihydroxyvitamin D_3. Sci Rep. 2019;9(1):13963.	12/1	2019

Current Teaching Load

1	SCPS 202 Basic Physiology	3(2-3-5)
2	SCBM 261 Physiology for Medical Science I	2(2-0-4)
3	SCID 216 Nervous System and Muscle Physiology	4(4-0-8)
4	SCID 217 Lab in Nervous System and Muscle Physiology	1(0-2-1)
5	SCPS 606 Physiology Seminar I	1(1-0-2)
6	SCPS 607 Physiology Seminar II	1(1-0-2)
7	SCPS 608 Physiology Seminar III	1(1-0-2)
8	SCPS 630 Scientific Paper Analysis	1(0-2-1)
11	SCPS 639 Laboratory Teaching in Physiology	1(0-3-1)
12	SCPS 672 Seminar in Exercise Physiology	1(1-0-2)
13	SCPS 677 Seminar in Physiology IV	1(1-0-2)
14	SCPS 678 Scientific Writing and Communication	1(0-3-0)
15	SCSP 680 Systems Physiology I	3(3-0-6)
16	SCPS 690 Biostatistics in Biomedical Science	2(2-0-4)
17	SCPS 698 Thesis	12(0-36-0)
18	SCPS 699 Dissertation	36(0-108-0)
19	SCPS 799 Dissertation	48(0-144-0)
20	SCPS 898 Dissertation	36(0-108-0)

Assigned Teaching Load for the Proposed Program

1	SCPS 606 Physiology Seminar I	1(1-0-2)

2	SCPS 607 Physiology Seminar II	1(1-0-2)
3	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
4	SCPS 680 Systems Physiology I	3(3-0-6)
5	SCPS 681 Systems Physiology II	3(3-0-6)
6	SCPS 682 Professional Communication Skills	1(1-0-2)
7	SCPS 691 Biostatistics for physiology and Biomedical Research	2(2-0-4)
8	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
9	SCPS 693 Technology Entrepreneurship	1(0-2-1)
10	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
11	SCPS 698 Thesis	12(0-36-0)
12	SCPS 798 Thesis	36(0-108-0)

APPENDIX C

Curriculum Mapping

Appendix C
Curriculum Mapping

Plan A1 (Research only)

● Major responsibility ○ Minor responsibility

Subjects	Ethics		Knowledge		Intellectual skills		Interpersonal relationship and Responsibility			Mathematical Analytical thinking		
	1	2	1	2	1	2	1	2	3	1	2	3
1) Thesis												
SCPS 798 Thesis	●	●	●	●	●	●	●	●	●	●	●	●

Plan A2 (Coursework and research)

● Major responsibility ○ Minor responsibility

Subjects	Ethics		Knowledge		Intellectual skills		Interpersonal relationship and Responsibility			Mathematical Analytical thinking		
	1	2	1	2	1	2	1	2	3	1	2	3
1) Required courses												
SCID 518 Generic Skills in Science Research	●	●	●	●	o	o	●	●	●	●	●	●
SCPS 606 Physiology Seminar I	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 607 Physiology Seminar II	●	●	●	●	●	●	●	●	●	●	●	●

Subjects	Ethics		Knowledge		Intellectual skills		Interpersonal relationship and Responsibility			Mathematical Analytical thinking		
	1	2	1	2	1	2	1	2	3	1	2	3
SCPS 609 Scientific Paper Analysis and Writing	●	●	●	o	●	●	●	●	●	●	●	●
SCPS 680 Systems Physiology I	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 681 Systems Physiology II	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 682 Professional Communication Skills	●	●	●	o	●	●	●	●	●	o	●	●
SCPS 691 Biostatistics for physiology and Biomedical Research	●	●	●	o	●	●	●	●	o	●	●	●
2) Elective courses												
SCID 500 Cell and Molecular Biology	●	●	●	●	●	●	●	o	o	●	●	●
SCID 507 Microscopic Technique	●	●	●	●	●	●	●	●	●	●	●	●
SCID 509 Separation Techniques	●	●	●	●	●	●	●	●	●	●	●	●
SCID 513 Animal Cell Culture Techniques	●	●	●	●	●	●	●	●	●	●	●	●
SCID 514 Animal Experimentation in Biomedical Research	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 669 Clinical Exercise Physiology	●	●	●	●	●	●	●	●	o	●	●	●
SCPS 675 Molecular Exercise Physiology	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 684 Functional Anatomy and Kinesiology	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 685 Nutrition for Health and Sport	●	●	●	●	●	●	●	o	●	●	●	●
SCPS 688 Current Topics in Exercise Science	●	●	●	●	●	●	●	o	●	●	●	●

Subjects	Ethics		Knowledge		Intellectual skills		Interpersonal relationship and Responsibility			Mathematical Analytical thinking		
	1	2	1	2	1	2	1	2	3	1	2	3
SCPS 692 Fundamental Biomedical Innovation	●	●	●	●	●	●	●	●	●	o	●	●
SCPS 693 Technology Entrepreneurship	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 694 Development of Drugs and Nutraceutical Products	●	●	●	●	●	●	●	●	●	●	●	●
3) Thesis												
SCPS 698 Thesis	●	●	●	●	●	●	●	●	●	●	●	●

Table of Relationship between Learning Outcomes of the Program and Core Value of Mahidol University

Learning Outcomes (as stated in Section 5, item no. 2)	Core value of Mahidol University
1. Ethics	
1.1 Perform duties with professional ethics	Altruism, Integrity
1.2 Be honest, integrity, disciplined, punctual, respect the rules and no plagiarism	Integrity
2. Knowledge	
2.1 Understand knowledge in physiology	Mastery
2. 2 Able to acquire and integrate an additional knowledge of the related fields	Mastery
3. Intellectual Skills	
3.1 Able to analyze the problem leading to systemic conclusion	Mastery
3.2 Develop the concept of knowledge and works in physiology	Mastery, Originality
4. International Relationship and responsibility	
4.1 Be responsible for the assigned work	Mastery, Determination
4.2 Ability to work as a team with peers	Harmony
4.3 Ability to lead the team and to follow	Leadership
5. Mathematical Analytical Thinking, Communication Skills, and Information	
5.1 Effective Mathematical analytical thinking	Mastery
5.2 Ability in communication and presentation	Mastery
5. 3 Ability to transfer the knowledge effectively using information technology (IT) skills	Mastery

APPENDIX D

Program Learning Outcome

Appendix D
Program Learning Outcomes

Table 1: Comparison between before and after revised objective of the program

Objective of the Program BE. 2018	Revised Objective of the Program BE. 2023
Be professional morals and ethics in academic and profession	Have professional ethics and morals
Have knowledge of physiology principles in both theory and practice	Understand theoretical and practical aspects of physiology
Analyze, criticize and perform research in physiology for publication	Apply knowledge in physiology that lead to publications and/or innovation
Have team work skills, leadership skills and be responsible for the assigned tasks	Demonstrate responsibility, leadership, and ability to work with others
Use information technology to search, collect, communicate, transfer knowledge effectively	Apply mathematical analysis and information technology for effective communication to the public

Table 2: Relationship between objective of the program and program learning outcome

Objectives of the Program	Program Learning Outcomes*				
	PLO1	PLO2	PLO3	PLO4	PLO5
1. Have professional ethics and morals	✓				
2. Understand theoretical and practical aspects of physiology		✓			
3. Apply knowledge in physiology that lead to publications and/or innovation			✓		
4. Demonstrate responsibility, leadership, and ability to work with the others				✓	
5. Apply mathematical analysis and information technology for effective communication to the public					✓

* PLO1 Demonstrate ethics professional ethics and moral
PLO2 Evaluate physiological concepts for knowledge transfer/innovation and problem solving
PLO3 Apply research skills in physiology or related fields to produce publications/innovation
PLO4 Demonstrate responsibility, leadership, and ability to work with the others
PLO5 Transfer/disseminate knowledge by using various means of communications

Table 3: Standard domains of learning outcome and Program Learning Outcomes

Domains	Standard Learning Outcomes (TQF)	Program Learning Outcomes				
		PLO1	PLO2	PLO3	PLO4	PLO5
Ethics	1.1 Perform duties with professional ethics and following the regulations	✓				
	1.2 Be honest, integrity, disciplined, punctual, respect the rules and no plagiarism	✓				
Knowledge	2.1 Understand knowledge in physiology		✓			
	2.2 Able to acquire and integrate an additional knowledge of the related fields		✓			
Intellectual Development	3.1 Able to analyze the problem leading to systemic conclusion			✓		
	3.2 Develop the concept of knowledge and works in physiology			✓		
Interpersonal Relationship and Responsibility	4.1 Be responsible for the assigned work				✓	
	4.2 Ability to work as a team with peers				✓	
	4.3 Ability to lead the team and to follow				✓	
Math, Communication, IT Skills	5.1 Effective Mathematical analytical thinking					✓
	5.2 Ability in communication and presentation					✓
	5.3 Ability to transfer the knowledge effectively using information technology (IT) skills					✓

Table 4: Learning and Assessment Strategies for Program Learning Outcomes Evaluation

PLOs	Learning Method	Assessment
PLO1 Demonstrate ethics professional ethics and moral	1) Individual and group assignments 2) Presentation 3) Ethic training 4) Thesis	1) Ethic of reports and presentations 2) Certificates of training
PLO2 Evaluate physiological concepts for knowledge transfer/innovation and problem solving	1) Lecture/ Laboratory/ Discussion/Self-study 2) Case study 3) Assignment 4) Presentation 5) Thesis	1) Essay exam/Hand-on assessment 2) Ability to analyse the case study 3) Quality of report 4) Quality of presentation 5) Thesis works are published, presented in the conference or transformed into innovation
PLO3 Apply research skills in physiology or related fields to produce publications/innovation	1) Lecture/Discussion/Self-study 2) Thesis Project	1) Essay exam/Hands-on assessment 2) Thesis defense/ thesis works are published, presented in the conference or transformed into innovation
PLO4 Demonstrate responsibility, leadership, and ability to work with others	1) Group discussion 2) Group assignments 3) Assigned tasks required leadership and team work skills 4) Thesis	1) Class/team participation and discussion 2) Quality of presentation 3) Quality of the tasks and ability to be a leader and a follower
PLO5 Transfer/disseminate knowledge by using various means of communications	1) Assignment 2) Presentation 3) Thesis	1) Quality of writing 2) Quality of presentation

Table 5: Relationship between Courses of the Program and Program Learning Outcomes

Plan A1 (Research only)

Code	Name	Credits	PLOs				
			1	2	3	4	5
SCPS 798	Thesis	36(0-108-0)	M	M	M	M	M

Plan A2 (Coursework and research)

Code	Name	Credits	PLOs				
			1	2	3	4	5
1) Required Courses							
SCID 518	Generic Skills in Science Research	1(1-0-2)	**I**	**I**	**I**	**I**	**I**
SCPS 606	Physiology Seminar I	1(1-0-2)	R	R	R	R	R
SCPS 607	Physiology Seminar II	1(1-0-2)	R	R	R	R	R
SCPS 609	Scientific Paper Analysis and Writing	1(1-0-2)	R	R	R	R	R
SCPS 680	Systems Physiology I	3(3-0-6)	R	R	R	R	R
SCPS 681	Systems Physiology II	3(3-0-6)	R	R	R	R	R
SCPS 682	Professional Communication Skills	1(1-0-2)	P	P	**P**	P	P
SCPS 691	Biostatistics for Physiology and Biomedical Research	2(2-0-4)	R	R	R	R	R
2) Elective Courses							
SCID 500	Cell and Molecular Biology	3(3-0-6)	I	I	I	**I**	I
SCID 507	Microscopic Technique	1(0-2-1)	R	R	R	**I**	R
SCID 509	Separation Techniques	1(0-2-1)	P	P	P	**I**	R
SCID 513	Animal Cell Culture Techniques	1(0-2-1)	R	R	R	**I**	R
SCID 514	Animal Experimentation in Biomedical Research	1(0-2-1)	R	R	R	**I**	R
SCPS 669	Clinical Exercise Physiology	2(2-0-4)	R				
SCPS 675	Molecular Exercise Physiology	2(2-0-4)	R				
SCPS 684	Functional Anatomy and Kinesiology	2(2-0-4)	R				
SCPS 685	Nutrition for Health and Sport	2(2-0-4)	R				
SCPS 688	Current Topics in Exercise Science	2(2-0-4)	R	R	R		
SCPS 692	Fundamental Biomedical Innovation	1(1-0-2)	P	P	P	**I**	P

Code	Name	Credits	PLOs				
			1	2	3	4	5
SCPS 693	Technology Entrepreneurship	1(0-2-1)	P	P	P	I	P
SCPS 694	Development of Drugs and Nutraceutical Products	2(2-0-4)	P	P	P	I	P
3) **Thesis**							
SCPS 698	Thesis	12(0-36-0)	M	M	M	M	M

I = ELO is introduced & assessed R = ELO is reinforced & assessed

P = ELO is practiced & assessed M = Level of mastery is assessed

Table 6: The expectation of learning outcomes at the end of the academic year

Plan A1 (Research only)

Year of study	Knowledge, skills, and any other expected learning outcomes
1st	Students are able to evaluate fundamental and advanced knowledges in physiology or related fields and demonstrate ethics, responsibility with teamwork and leadership skills. Students are able to design research work based on knowledges and skills in research.
2nd	Students are able to develop the research work based on knowledges and skills in research. In addition, students are able to transfer knowledge by using various means of communications.

Plan A2 (Course work and Research)

Year of study	Knowledge, skills, and any other expected learning outcomes
1st	Students are able to evaluate fundamental and advanced knowledges in physiology or related fields and demonstrate ethics, responsibility with teamwork and leadership skills.
2nd	Students are able to develop the research work based on knowledges and skills in research. In addition, students are able to transfer knowledge by using various means of communications.

APPENDIX E

The revised of Program

Appendix E
(For only Revised Curriculum)
The Revision of Master's Degree Program
in Physiology Volume 2018
Faculty of Science
and Faculty of Graduate Studies, Mahidol University

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1. **The Curriculum was approved by the Office of the Higher Education Commission on .....**

2. **The Mahidol University Council has approved this revised curriculum in the** Meeting 586 on November 16, 2022

3. **The revised curriculum will be effective with student class** in first year from the first semester of the Academic Year 2023 onwards.

4. Rationale of revision

4.1 The curriculum is revised to be in accordance with Thai Qualification Framework for Higher Education A.D. 2015

4.2 The curriculum is revised to update the courses from on-site to hybrid educational systems (on-site/online).

4. The details of the revision

5.1 Request for offering the new study plan, teaching schedule, courses**,** and updated the name of Full time instructors of the curriculumm cademic staff of the program

Current Program	Revised Program
Professor Dr. Jonggonnee Wattanapermpool	Professor Dr. Jonggonnee Wattanapermpool
Professor Dr. Narattaphol Charoenphandhu, MD.	Professor Dr. Narattaphol Charoenphandhu, MD.
Professor Dr. Chatchai Muanprasat, MD.	-
Associate Professor Dr. Arthit Chairoungdua	Associate Professor Dr. Arthit Chairoungdua
Associate Professor Dr. Jittima Weerachayaphorn	Associate Professor Dr. Jittima Weerachayaphorn
Associate Professor Dr. Ratchakrit Srikuea	Associate Professor Dr. Ratchakrit Srikuea
Associate Professor Dr. Sunhapas Soodvilai	Associate Prof. Dr. Sunhapas Soodvilai
Associate Professor Dr. Tepmanas Bupha-Intr	Associate Prof. Dr. Tepmanas Bupha-Intr
Associate Professor Dr. Vitoon Saengsirisuwan	Associate Prof. Dr. Vitoon Saengsirisuwan

Current Program	Revised Program
Assistant Professor Dr. Nattapon Panupinthu, MD.	Assistant Prof. Dr. Nattapon Panupinthu, MD.
Assistant Professor Dr. Witchuda Saengsawang	Assistant Prof. Dr. Witchuda Saengsawang
Lecturer Dr. Kanit Bhukhai	Lecturer Dr. Kanit Bhukhai
Lecturer Dr. Ioannis D. Papadimitriou	Lecturer Dr. Ioannis D. Papadimitriou
-	Lecturer Dr. Nittaya Boonmuen
-	Lecturer Dr. Ratchaneevan Aeimlapa

The Comparison Table of Courses between the Current Program and Revised Program

Plan A1 (Research only)

Courses of the Current Program	Courses of the Revised Program	Remark
-	**Thesis (36 credits)** SCPS 798 Thesis 36 (0-108-0) วทสร ๗๙๘ วิทยานิพนธ์	New

Plan A2 (Coursework and research)

Courses of the Current Program	Courses of the Revised Program	Remark
Required Courses (14 credits)	**Required Courses (13 credits)**	
SCID 516 Biostatistics 3(3-0-6) วทคร ๕๑๖ ชีวสถิติ	-	Cancelled
SCID 518 Generic Skills in Science Research 1(1-0-2) วทคร ๕๑๘ ทักษะทั่วไปในการวิจัยทางวิทยาศาสตร์	SCID 518 Generic Skills in Science Research 1(1-0-2) วทคร ๕๑๘ ทักษะทั่วไปในการวิจัยทางวิทยาศาสตร์	Unchanged
SCPS 606 Physiology Seminar I 1(1-0-2) วทสร ๖๐๖ สัมมนาสรีรวิทยา ๑	SCPS 606 Physiology Seminar I 1(1-0-2) วทสร ๖๐๖ สัมมนาสรีรวิทยา ๑	Changed Description
SCPS 607 Physiology Seminar II 1(1-0-2) วทสร ๖๐๗ สัมมนาสรีรวิทยา ๒	SCPS 607 Physiology Seminar II 1(1-0-2) วทสร ๖๐๗ สัมมนาสรีรวิทยา ๒	Changed Description
SCPS 630 Scientific Paper Analysis 1(0-2-1) วทสร ๖๓๐ การวิเคราะห์บทความทางวิทยาศาสตร์	SCPS 609 Scientific Paper Analysis and Writing 1(1-0-2) วทสร ๖๐๙ การวิเคราะห์และการเขียนบทความทางวิทยาศาสตร์	Undate credit, Changed code, Name, Title and Description
SCPS 639 Laboratory Methods in Physiology 1(0-3-1) วทสร ๖๓๙ วิธีปฏิบัติการทางสรีรวิทยา	-	Cancelled

Courses of the Current Program	Courses of the Revised Program	Remark
SCPS 680 Systems Physiology I 3(3-0-6) วทสร ๖๘๐ สรีรวิทยาเชิงระบบ ๑	SCPS 680 Systems Physiology I 3(3-0-6) วทสร ๖๘๐ สรีรวิทยาเชิงระบบ ๑	Changed Description
SCPS 681 Systems Physiology II 3(3-0-6) วทสร ๖๘๑ สรีรวิทยาเชิงระบบ ๒	SCPS 681 Systems Physiology II 3(3-0-6) วทสร ๖๘๑ สรีรวิทยาเชิงระบบ ๒	Changed Description
-	SCPS 682 Professional Communication Skills 1(1-0-2) วทสร ๖๘๒ ทักษะการสื่อสารอย่างมืออาชีพ	Changed from elective, Decrease credit, Changer Description
-	SCPS 691 Biostatistics for Physiology and Biomedical Research 2(2-0-4) วทสร ๖๙๑ ชีวสถิติสำหรับสรีรวิทยาและการวิจัยวิทยาศาสตร์การแพทย์	New course
Elective Courses (10 credits)	**Elective Courses (11 credits)**	
SCID 500 Cell and Molecular Biology 3(3-0-6) วทคร ๕๐๐ ชีววิทยาระดับเซลล์และโมเลกุล	SCID 500 Cell and Molecular Biology 3(3-0-6) วทคร ๕๐๐ ชีววิทยาระดับเซลล์และโมเลกุล	Unchanged
SCID 502 Cell Science 2(2-0-4) วทคร ๕๐๒ วิทยาศาสตร์เรื่องเซลล์	-	Cancelled
SCID 506 Concepts of Molecular Bioscience 2(2-0-4) วทคร ๕๐๖ หลักการทางวิทยาศาสตร์ชีวภาพระดับโมเลกุล	-	Cancelled
SCID 507 Microscopic Technique 1(0-2-1) วทคร ๕๐๗ เทคนิคการใช้กล้องจุลทรรศน์	SCID 507 Microscopic Technique 1(0-2-1) วทคร ๕๐๗ เทคนิคการใช้กล้องจุลทรรศน์	Unchanged
SCID 508 Biomolecular and Spectroscopy Techniques 1(0-2-1) วทคร ๕๐๘ เทคนิคด้านชีวโมเลกุลและด้านสเปกโทรสโกปี	-	Cancelled
SCID 509 Separation Techniques 1(0-2-1) วทคร ๕๐๙ เทคนิคการแยกสาร	SCID 509 Separation Techniques 1(0-2-1) วทคร ๕๐๙ เทคนิคการแยกสาร	Unchanged
SCID 510 Immunological Methods 1(0-2-1) วทคร ๕๑๐ ระเบียบวิธีวิทยาภูมิคุ้มกัน	-	Cancelled
SCID 511 Gene Technology 1(0-2-1) วทคร ๕๑๑ เทคโนโลยีด้านยีน	-	Cancelled
SCID 512 Receptor Binding and Enzyme Kinetic Assays 1(0-2-1)	-	Cancelled

Courses of the Current Program	Courses of the Revised Program	Remark
วทคร ๕๑๒ การสอบปริมาณการจับตัวรับและเอนไซม์เชิงจลน์		
SCID 513 Animal Cell Culture Techniques 1(0-2-1) วทคร ๕๑๓ เทคนิคการเพาะเลี้ยงเซลล์สัตว์	SCID 513 Animal Cell Culture Techniques 1(0-2-1) วทคร ๕๑๓ เทคนิคการเพาะเลี้ยงเซลล์สัตว์	Unchanged
SCID 514 Animal Experimentation in Biomedical Research 1(0-2-1) วทคร ๕๑๔ การใช้สัตว์ทดลองในงานวิจัยทางชีวการแพทย์	SCID 514 Animal Experimentation in Biomedical Research 1(0-2-1) วทคร ๕๑๔ การใช้สัตว์ทดลองในงานวิจัยทางชีวการแพทย์	Unchanged
-	SCPS 669 Clinical Exercise Physiology 2(2-0-4) วทสร ๖๖๙ สรีรวิทยาการออกกำลังกายทางคลินิก	Add course
-	SCPS 675 Molecular Exercise Physiology 2(2-0-4) วทสร ๖๗๕ สรีรวิทยาการออกกำลังกายระดับโมเลกุล	Add course
-	SCPS 684 Functional Anatomy and Kinesiology 2(2-0-4) วทสร ๖๘๔ กายวิภาคศาสตร์และวิทยาศาสตร์การเคลื่อนไหว	New course
-	SCPS 685 Nutrition for Health and Sport 2(2-0-4) วทสร ๖๘๕ โภชนาการสำหรับสุขภาพและการกีฬา	New course
-	SCPS 688 Current Topics in Exercise Science 2(2-0-4) วทสร ๖๘๘ หัวข้อปัจจุบันทางวิทยาศาสตร์การออกกำลังกาย	New course
SCPS 682 Professional Communication Skills 2(2-0-4) วทสร ๖๘๒ ทักษะการสื่อสารอย่างมืออาชีพ	-	Changed to Required Courses
	SCPS 692 Fundamental Biomedical Innovation 1(1-0-2) วทสร ๖๙๒ นวัตกรรมชีวการแพทย์พื้นฐาน	New course
	SCPS 693 Technology Entrepreneurship1(0-2-1) วทสร ๖๙๓ ผู้ประกอบการธุรกิจเทคโนโลยี	New course
	SCPS 694 Development of Drugs 2(2-0-4)	New course

Courses of the Current Program	Courses of the Revised Program	Remark
	and Nutraceutical Products วทสร ๖๙๔ การพัฒนายาและโภชนเภสัชภัณฑ์	
Thesis (12 credits) SCPS 698 Thesis 12(0-36-0) วทสร ๖๙๘ วิทยานิพนธ์	**Thesis (12 credits)** SCPS 698 Thesis 12(0-36-0) วทสร ๖๙๘ วิทยานิพนธ์	Changed Description

6. The Comparison Table of the Curriculum Structure between the Current Program and Revised Program Based on Criteria on Graduate Studies A.D. 2015 (set by Ministry of Education)

6.1 Plan A1 (Research only)

Course Category	Credits		
	Criteria on Graduate Studies A.D. 2015	Curriculum Structure of the Current Program	Curriculum Structure of the Revised Program
Thesis	36	-	36
Total credits (not less than)	36	36	36

6.2 Plan A2 (Coursework and research)

Course Category	Credits		
	Criteria on Graduate Studies A.D. 2015	Curriculum Structure of the Current Program	Curriculum Structure of the Revised Program
1. Required courses 2. Elective courses 3. Thesis	24 Credits 12 Credits	14 10 12	13 11 12
Total credits (not less than)	36	36	36

คำสั่ง คณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล

ที่ ๑๕๗/๒๕๖๔

เรื่อง แต่งตั้งคณะกรรมการปรับปรุงหลักสูตรวิทยาศาสตรมหาบัณฑิต

สาขาวิชาสรีรวิทยา (หลักสูตรนานาชาติ)

เพื่อให้การบริหารจัดการงานด้านหลักสูตรระดับบัณฑิตศึกษา คณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล เป็นไปด้วยความเรียบร้อยต่อเนื่อง มีประสิทธิภาพและประสิทธิผล เป็นไปในแนวเดียวทางกัน และสอดคล้องตามประกาศบัณฑิตวิทยาลัย เรื่อง หลักเกณฑ์และแนวทางการพัฒนาหลักสูตรระดับบัณฑิตศึกษา พ.ศ. ๒๕๕๗

อาศัยอำนาจตามความในข้อ ๕.๒.๑ ของประกาศบัณฑิตวิทยาลัย เรื่อง หลักเกณฑ์และแนวทางการพัฒนาหลักสูตรระดับบัณฑิตศึกษา พ.ศ. ๒๕๕๗ คณบดีคณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล จึงพิจารณาแต่งตั้งผู้มีรายนามดังต่อไปนี้ เป็นคณะกรรมการปรับปรุงหลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาวิชาสรีรวิทยา (หลักสูตรนานาชาติ)

๑. ผศ.ดร.วิชชุดา แสงสว่าง	ประธานกรรมการ
๒. ศ.ดร.จงกลณี วัฒนาเพิ่มพูล	กรรมการ
๓. ศ.ดร.นพ.นรัตถพล เจริญพันธุ์	กรรมการ
๔. รศ.ดร.จิตติมา วีระชยาภรณ์	กรรมการ
๕. รศ.ดร.เทพมนัส บุปผาอินทร์	กรรมการ
๖. รศ.ดร.สัณหภาส สุดวิลัย	กรรมการ
๗. รศ.ดร.วิฑูร แสงศิริสุวรรณ	กรรมการ
๘. รศ.ดร.อาทิตย์ ไชยร้องเดื่อ	กรรมการ
๙. ผศ.ดร.นพ.ณัฐพล ภาณุพินธุ	กรรมการ
๑๐. ผศ.ดร.รัชกฤต ศรีเกื้อ	กรรมการ
๑๑. อ.ดร.ชลลวัลย์ แสงเจริญธรรม	กรรมการ
๑๒. อ.ดร.คณิต ภู่ไข่	กรรมการ
๑๓. อ.ดร.นิตยา บุญหมื่น	กรรมการ
๑๔. อ.ดร.รัชนีวรรณ เอี่ยมลาภะ	กรรมการ
๑๕. อ.ดร.สุวิมล ตั้งตรงทรัพย์	กรรมการ

๑๖. Dr.Ioannis Papadimitriou	กรรมการ
๑๗. ศ.ดร.พิมพ์ใจ ใจเย็น	ผู้ทรงคุณวุฒิภายนอก
๑๘. Prof.Dr. Mrinalini C. Rao	ผู้ทรงคุณวุฒิภายนอก

หน้าที่คณะกรรมการปรับปรุงหลักสูตรมีดังนี้

๑. พิจารณาความพร้อมและศักยภาพของหน่วยงานที่ประสงค์จะปรับปรุงหลักสูตร

๒. สำรวจความต้องการของผู้เรียน ผู้ใช้บัณฑิต สังคม รวมทั้งข้อมูลความต้องการ และแนวโน้มของตลาดแรงงานในอนาคต

๓. ศึกษาข้อมูลพื้นฐานเกี่ยวกับการเปิดสอนหลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาวิชาสรีรวิทยา (หลักสูตรนานาชาติ) หรือใกล้เคียงจากต่างสถาบันทั้งในประเทศและ/หรือต่างประเทศ

๔. ศึกษาทำความเข้าใจมาตรฐานผลการเรียนรู้ แต่ละด้านของระดับคุณวุฒิ ลักษณะของหลักสูตร และคุณลักษณะของบัณฑิตที่พึงประสงค์ของหลักสูตรวิทยาศาสตรมหาบัณฑิต สาขาวิชาสรีรวิทยา (หลักสูตรนานาชาติ)

๕. ดำเนินการปรับปรุงหลักสูตร โดยจัดทำรายละเอียดของหลักสูตร รายละเอียดของรายวิชา และรายละเอียดของประสบการณ์ภาคสนาม (ถ้ามี) ให้ชัดเจน และสอดคล้องกับกรอบมาตรฐานคุณวุฒิระดับอุดมศึกษาแห่งชาติ เกณฑ์มาตรฐานหลักสูตรระดับบัณฑิตศึกษา และข้อบังคับมหาวิทยาลัยมหิดลว่าด้วยการศึกษาระดับบัณฑิตศึกษา ตามแบบ มคอ.๒, มคอ.๓ และ มคอ.๔ เสนอต่อที่ประชุมคณะกรรมการประจำคณะวิทยาศาสตร์

๖. กำหนดแนวทางการทวนสอบมาตรฐานผลการเรียนรู้ของนักศึกษา

๗. กำหนดการประกันคุณภาพของหลักสูตร

๘. ประสานงานกับบัณฑิตวิทยาลัย และ/หรือหน่วยงานที่เกี่ยวข้อง ตามขั้นตอนการพิจารณาปรับปรุงหลักสูตร

ทั้งนี้ ตั้งแต่วันที่ ๒๓ มีนาคม พ.ศ. ๒๕๖๔ เป็นต้นไป โดยสิ้นสุดภาระหน้าที่เมื่อสภามหาวิทยาลัยมหิดลอนุมัติการขอปรับปรุงหลักสูตร

สั่ง ณ วันที่ ๒๖ มีนาคม พ.ศ. ๒๕๖๔

(รองศาสตราจารย์ ดร.พลังพล คงเสรี)
คณบดีคณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล