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

DOCTOR OF PHILOSOPHY PROGRAM
IN
PHYSIOLOGY
(INTERNATIONAL PROGRAM/REVISED PROGRAM A.D. 2023)

FACULTY OF SCIENCE
AND
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY

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Doctor of Philosophy 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** หลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาสรีรวิทยา (หลักสูตรนานาชาติ)
   - **English** Doctor of Philosophy Program in Physiology (International Program)

2. **Name of Degree and Major**
   - Full Title Thai: ปรัชญาดุษฎีบัณฑิต (สรีรวิทยา)
   - Abbreviation Thai: ปร.ด. (สรีรวิทยา)
   - Full Title English: Doctor of Philosophy (Physiology)
   - Abbreviation English: Ph.D. (Physiology)

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

4. **Required Credits:**
   Plan 2 : Coursework and Research
   Plan 2.1 For students with Master's Degree: not less than 48 credits
   Plan 2.2 For Students with Bachelor's Degree: not less than 72 credits

5. **Curriculum Characteristics**
   - 5.1 **Curriculum type/model:** Doctoral 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 in semester 1, academic year 2023 onwards
   - 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 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 the criteria set by Thai Qualification Framework for Higher Education in academic year 2026 (3 years after implementation).

8. Career Opportunities for the Graduates

8.1 Specialist in Physiology and related discipline

8.2 Further training as Postdoctoral fellows in Physiology and related discipline

8.3 Researcher in physiology and related fields in academic/ drug/ food industrial institutes

8.4 Project leader in research institutes

8.5 Research specialist or consultant in drug, food, or 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, Faculty of Science, Mahidol University
2	x-xxxx-xxxxx-xx-x Assocate 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) Khon Kaen University: 1993	Department of Physiology, Faculty of Science, Mahidol University
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, Faculty of Science, Mahidol University

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

According to the Sustainable Development Goals (SDGs) that consists of inter-related areas (total 17 SDGs) to provide a framework for achieving the global impact. SDG3 is the main area related to the impact on ensure healthy lives and promote well-being for all ages. Physiology, the science of function, 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 this knowledge towards research and/or innovation to promote health and well-being and thereby support economic and social development.

11.2 Social and Cultural Situation/Development

The current situation of Thailand and ASEAN countries is one of changes from rural to urban society which has affected lifestyle and led to an increased prevalence of non-communicable diseases, i.e., diabetes, hypertension, obesity, etc. Moreover, Thai society is becoming an aging population and there is a high probability that Thailand will have to bear an increasing cost of healthcare. Understanding human physiology is necessary for the development of prevention strategies and treatments for such diseases. Therefore, the program is designed to produce graduates that have knowledge in physiology, the fundamental functioning of living systems, and who can further distribute such knowledge to the society and be an important part of the 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 are mentioned in 11.1 and 11.2. were taken into consideration during the formulation of the expected learning outcomes (ELOs) of the Ph.D. 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 Ph.D. 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:

		Credits (lecture – laboratory – self-study)
SCID 500	Cell and Molecular Biology	3 (3-0-6)
SCID 502	Cell Science	2 (2-0-4)
SCID 506	Concepts of Molecular Biosciences	2 (2-0-4)
SCID 508	Biomolecular and Spectroscopy Techniques	1 (0-2-1)
SCID 510	Immunological Methods	1 (0-2-1)
SCID 511	Gene Technology	1 (0-2-1)
SCID 512	Receptor Binding and Enzyme Kinetic Assays	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. The course syllabus is provided to students before class. The progression of the students is monitored throughout the course by the 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 educating graduate students to attain academic achievement through learning-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 country.

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 the professional ethics and moral

1.2.2 Have in-depth knowledge of physiology and related fields

1.2.3 Establish novel research in physiology and related fields with international standards

1.2.4 Have responsibility, leadership, and the ability to work with the others

1.2.5 Have the ability of mathematical analysis and information technology for effective communications

1.3 **Program Learning Outcomes (PLOs)**

1.3.1 Demonstrate moral and professional ethics

1.3.2 Integrate knowledge in physiology and related fields for knowledge transfer/innovation and problem solving;

1.3.3 Create research in physiology and related fields to produce international publications, patents or innovations;

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

1.3.5 Deliver specific and generalizable knowledge effectively by using various means of communication,

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 including alumni, employers and from the faculty members 1.2 Evaluation of courses and curriculum from current students 1.3 Monthly program committees meeting	1.1 Annually satisfactory evaluation report (once a year) 1.2 Annually stakeholder survey report (once a year) 1.3 Monthly program committees meeting report
2. To ensure the quality of teaching and learning activities	2.1 Monitor and evaluate the teaching techniques of new instructors by	2.1 Documents of training needs survey (once a year)

Plan for Development/Revision	Strategies	Evidences/Indexes
	representative experienced instructor appointed by the program 2.2 Survey needs of training to promote interactive teaching and learning 2.3 Provide constructive feedback and training for instructors to promote interactive teaching and learning	2.2 Training certificates and/or a summary of new teaching/evaluation techniques development 2.3 Satisfaction average scores of teachings and learning evaluation > 3.5 out of 5

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 regular management, the offered courses are scheduled during normal working hours (08:30 a.m. – 04:30 p.m.) on weekdays (Monday – Friday). However,

Semester 1 August – December

Semester 2 January – May

2.2 Qualifications of Prospective Students

Plan 2 Coursework and research

Plan 2.1 For students with Master's Degreee

2.1.1 Holding a Master's degree in Biomedical Science, Pharmacy, Physical Therapy, Veterinary Medicine or the equivalent degree provided by the institutions accredited by the Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation; with research experience

2.1.2 Having a cumulative GPA of not less than 3.50

2.1.3 Attain minimum requirement for English Proficiency Examination score as the requirement of the Faculty of Graduate Studies

2.1.4 Applicants who do not meet the requirements indicated in 2.1.2 – 2.1.3 may be considered by the Program committee and the Dean of the Faculty of Graduate Studies.

Plan 2.2 For student with Bachelor's Degree

2.2.1 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 provided by the institutions which are accredited by the Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation;

2.2.2 Having a cumulative GPA of not less than 3.50;

2.2.3 Attain minimum requirement for English Proficiency Examination score as the requirement of the Faculty of Graduate Studies

2.2.4 Applicants who do not meet the requirements indicated in 2.2.2 – 2.2.3 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 backgrounds

2.3.2 inadequate English proficiency

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

Problems of New Students	Strategies for Problem Solving
1. Students enrolled in the program have bachelor's degrees with different backgrounds. 2. Students have English language issues for writing and communication.	1. Curriculum provides fundamental courses for adjustment of the basic knowledge required for the program before (SCID500) and during (SCID518) the first semester of study. 2. Advisory systems are designed to support each student. The advisor advises students to take additional English training courses as necessary.

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

Plan 2 Coursework and research

Plan 2.1 For students with Master's Degree

Academic Year	2023	2024	2025	2026	2027
1st	5	5	5	5	5
2nd	-	5	5	5	5
3rd	-	-	5	5	5
Cumulative numbers	5	10	15	15	15
Expected number of students graduated	-	-	5	5	5

Plan 2.2 For students with Bachelor's Degree

Academic Year	2023	2024	2025	2026	2027
1st	5	5	5	5	5
2nd	-	5	5	5	5
3rd	-	-	5	5	5
4th	-	-	-	5	5
Cumulative numbers	5	10	15	20	20
Expected number of students graduated	-	-	-	5	5

2.6 Budget based on the plan

Budget: The budget is from Ph.D. Program in Physiology, Faculty of Science, Mahidol University.

Plan 2.1 For students with Master's Degree

Estimated income per student	**Baht**
Registration fee	
Tuition (12 Credits)	xxx,xxx
Dissertation (36 Credits)	xx,xxx
Research supplies fee	xxx,xxx
Qualifying Examination	x,xxx
Total income per student	**xxx,xxx**
Estimated expenses	
Variable expenses per student	
College/university allocation	xx,xxx
Position allowance for Qualifying Examination	x,xxx
Position allowance for dissertation 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	**2 persons**
Cost of students at break-even point	**xxx,xxx**
Expenses per student per academic year (3 year)	**109,933**

Plan 2.2 For students with Bachelor's Degree

Estimated income per student	**Baht**
Registration fee	
Tuition (24 Credits)	xxx,xxx
Dissertation (48 Credits)	xx,xxx
Qualifying Examination	x,xxx
Research supplies fee	xxx,xxx
Total income per student	**xxx,xxx**
Estimated expenses	
Variable expenses per student	
College/university allocation	xx,xxx
Position allowance for Qualifying Examination	x,xxx
Position allowance for dissertation advisor and committee	xx,xxx
Total variable expenses per student	**xxx,xxx**
Fixed expenses	
Program director payment	-
Program secretary payment	-
Staff salary	xxx,xxx
Teaching payment	xxx,xxx
Utility fee	-
Material fee	xxx,xxx
Equipment fee	xxx,xxx
Management fee	xxx,xxx
Total fixed expenses	**x,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 (4 year)	**125,683**

2.7 Educational System: Hybrid Educational Systems

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

Credits transferred must comply with Mahidol University's regulations on Graduate Studies.

3. Curriculum and Instructors

3.1 Curriculum

3.1.1 Number of credits

Plan 2 Coursework and research

Plan 2.1: For students with Master's Degree: Not less than 48 credits

Plan 2.2: For students with Bachelors Degree Not less than 72 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, Doctor of Philosophy Program which has Plan 2.1 and Plan 2.2

Plan 2 Coursework and research

Plan 2.1: For students with Master's Degree

Required Courses	6 credits
Elective Courses (not less than)	6 credits
Dissertation	36 credits
Total credits (not less than)	48 credits

Plan 2.2: For students with Bachelor's Degree

Required Courses	18 credits
Elective courses (not less than)	6 credits
Dissertation	48 credits
Total credits (not less than)	72 credits

3.1.3 Courses in the curriculum

Plan 2 Course work and research

Plan 2.1 : For students with Master's Degree

1. Required Courses 6 credits

		Credits (lecture – practice – self-study)
SCPS 608	Physiology Seminar III	1(1-0-2)
วทสร ๖๐๘	สัมมนาสรีรวิทยา ๓	
SCPS 679	Advanced Topics in Physiology	3(3-0-6)
วทสร ๖๗๙	หัวข้อทางสรีรวิทยาขั้นสูง	
*SCPS 695	Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
วทสร ๖๙๕	วิทยาระเบียบวิธีวิจัย การจัดการ การสื่อสารและการหาทุนวิจัย	

* New courses

2. Elective Courses (not less than 6 credits)

		Credits (lecture – practice – self-study)
SCID 502	Cell Science	2(2-0-4)
วทคร ๕๐๒	วิทยาศาสตร์เรื่องเซลล์	
SCID 506	Concepts of Molecular Bioscience	2(2-0-4)
วทคร ๕๐๖	หลักการทางวิทยาศาสตร์ชีวภาพระดับโมเลกุล	
SCID 508	Biomolecular and Spectroscopy Techniques	1(0-2-1)
วทคร ๕๐๘	เทคนิคด้านชีวโมเลกุลและด้านสเปกโทรสโกปี	
SCID 511	Gene Technology	1(0-2-1)
วทคร ๕๑๑	เทคโนโลยีด้านยีน	
*SCPS 668	Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
วทสร ๖๖๘	การตอบสนองทางเมแทบอลิซึมต่อการออกกำลังกายและความเครียดจากสภาวะแวดล้อม	
*SCPS 676	Physiology of Aging	1(1-0-2)
วทสร ๖๗๖	สรีรวิทยาการชราภาพ	
*SCPS 687	Health Risk Appraisal in Fitness Facility	2(2-0-4)
วทสร ๖๘๗	การประเมินความเสี่ยงด้านสุขภาพในสถานที่ออกกำลังกาย	
*SCPS 801	Health Risks and Exercise Management in the Elderly	2(2-0-4)
วทสร ๘๐๑	ความเสี่ยงด้านสุขภาพและการจัดการการออกกำลังกายในผู้สูงอายุ	

* New courses

In addition to the elective courses mentioned above, 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 student' s interest with the approval of the advisor and the curriculum committee or the recommendation from curriculum committee

Plan 2.2 : For students with Bachelor's Degree

1. Required Courses 18 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 608	Physiology Seminar III	1(1-0-2)
วทสร ๖๐๘	สัมมนาสรีรวิทยา ๓	
SCPS 609	Scientific Paper Analysis and Writing	1(1-0-2)
วทสร ๖๐๙	การวิเคราะห์และการเขียนบทความทางวิทยาศาสตร์	
SCPS 679	Advanced Topics in Physiology	3(3-0-6)
วทสร ๖๗๙	หัวข้อทางสรีรวิทยาขั้นสูง	
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 691	Biostatistics for Physiology and Biomedical Research	2(2-0-4)
วทสร ๖๙๑	ชีวสถิติสำหรับสรีรวิทยาและการวิจัยวิทยาศาสตร์การแพทย์	
*SCPS 695	Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
วทสร ๖๙๕	วิทยาระเบียบวิธีวิจัย การจัดการ การสื่อสารและการหาทุนวิจัย	

2. Elective Courses (not less than 6 credits)

SCID 500	Cell and Molecular Biology	3(3-0-6)
วทคร ๕๐๐	ชีววิทยาระดับเซลล์และโมเลกุล	
SCID 502	Cell Science	2(2-0-4)
วทคร ๕๐๒	วิทยาศาสตร์เรื่องเซลล์	
SCID 506	Concepts of Molecular Bioscience	2(2-0-4)
วทคร ๕๐๖	หลักการทางวิทยาศาสตร์ชีวภาพระดับโมเลกุล	
SCID 508	Biomolecular and Spectroscopy Techniques	1(0-2-1)
วทคร ๕๐๘	เทคนิคด้านชีวโมเลกุลและด้านสเปกโทรสโกปี	
SCID 510	Immunological Methods	1(0-2-1)
วทคร ๕๑๐	ระเบียบวิธีวิทยาภูมิคุ้มกัน	

		Credits (lecture – practice – self-study)
SCID 511	Gene Technology	1(0-2-1)
วทคร ๕๑๑	เทคโนโลยีด้านยีน	
SCID 512	Receptor Binding and Enzyme Kinetic Assays	1(0-2-1)
วทคร ๕๑๒	การสอบปริมาณการจับตัวรับและเอนไซม์เชิงจลน์	
SCID 514	Animal Experimentation in Biomedical Research	1(0-2-1)
วทคร ๕๑๔	การใช้สัตว์ทดลองในงานวิจัยทางชีวการแพทย์	
*SCPS 668	Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
วทสร ๖๖๘	การตอบสนองทางเมแทบอลิซึมต่อการออกกำลังกายและความเครียดจากสภาวะแวดล้อม	
*SCPS 676	Physiology of Aging	1(1-0-2)
วทสร ๖๗๖	สรีรวิทยาการชราภาพ	
*SCPS 687	Health Risk Appraisal in Fitness Facility	2(2-0-4)
วทสร ๖๘๗	การประเมินความเสี่ยงด้านสุขภาพในสถานที่ออกกำลังกาย	
*SCPS 692	Fundamentals 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	
*SCPS 801	Health Risks and Exercise Management in the Elderly	2(2-0-4)
วทสร ๘๐๑	ความเสี่ยงด้านสุขภาพและการจัดการการออกกำลังกายในผู้สูงอายุ	

* New courses

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

Dissertation

Plan 2 Coursework and research

Plan 2.1: For students with Master's Degree

	Credits (lecture – practice – self-study)
SCPS 699 Dissertation	36(0-108-0)
วทสร ๖๙๙ วิทยานิพนธ์	

Plan 2.2: For students with Bachelor's Degree

SCPS 799 Dissertation	48(0-144-0)
วทสร ๗๙๙ วิทยานิพนธ์	

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

3.1.3 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 multidisciplinary departments

PS: สร indicates that the course is organized by the department of physiology

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

3.1.4 Study Plan

Plan 2 Coursework and research

Plan 2.1: For students with Master's Degree

Year	Semester 1			Semester 2		
1	SCPS 608	Physiology Seminar III	1(1-0-2)	SCPS 679	Advanced Topics in Physiology	3(3-0-6)
				SCPS 695	Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
		Qualification examination				
				SCPS 799	Dissertation	4(0-12-0)
		Elective courses	3 credits		Elective courses	3 credits
		Total 4 credits			**Total 12 credits**	
2	SCPS 699	Dissertation	8(0-24-0)	SCPS 699	Dissertation	8(0-24-0)
		Total 8 credits			**Total 8 credits**	
3	SCPS 699	Dissertation	8(0-24-0)	SCPS 699	Dissertation	8(0-24-0)
					Dissertation examination	
		Total 8 credits			**Total 8 credits**	

Plan 2.2: For students with Bachelor's Degree

Year	Semester 1			Semester 2		
1	SCPS 680	Systems Physiology I	3(3-0-6)	SCPS 606	Physiology Seminar I	1(1-0-2)
	SCPS 681	Systems Physiology II	3(3-0-6)	SCPS 609	Scientific Paper Analysis and Writing	1(1-0-2)
	SCPS 691	Biostatistics for Physiology and Biomedical Research	2(2-0-4)	SCPS 679	Advanced Topics in Physiology	3(3-0-6)
	SCID 518	Generic Skills in Science Research	1(1-0-2)	SCPS 695	Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
	Elective courses		3 credits	Elective courses		3 credit
	Total 12 credits			**Total 10 credits**		
2	SCPS 607	Physiology Seminar II	1(1-0-2)	SCPS 608	Physiology Seminar III	1(1-0-2)
				SCPS 799	Dissertation	8 (0-24-0)
	Qualifying examination			Proposal examination		
	Total 1 credit			**Total 9 credits**		

Year	Semester 1		Semester 2	
3	SCPS 799 Dissertation	10 (0-30-0)	SCPS 799 Dissertation	10 (0-30-0)
	Total 10 credits		**Total 10 credits**	
4	SCPS 799 Dissertation	10 (0-30-0)	SCPS 799 Dissertation	10 (0-30-0)
			Dissertation examination	
	Total 10 credits		**Total 10 credits**	

3.1.5 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	Department of Physiology

No.	Identification Card Number Academic position - Name – Surname	Degree (Field of Study) University: Year of graduate	Department
		B.N.S. (Nursing Science) Mahidol University: 1995	
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
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 Professpr 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

No.	Identification Card Number Academic position - Name – Surname	Degree (Field of Study) University: Year of graduate	Department
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) Aristotle University, Greece: 2009 B.Sc. (Physical Education and Sports Science) Aristotle University, Greece: 2002	Department of Physiology
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

3.2.3 Part time instructors

Guest lecturers will be invited to teach for the specific course contents.

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

5. Dissertation 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 dissertation; publishing research works in international standard journal or presenting at an international conference.

Dissertation must be relevant to and reflec a knowledge of physiology. It must be submitted in accordance with the format and duration specified by the curriculum plan.

5.2 Standard Learning Outcomes

Students can integrate the knowledge in physiology with related fields to create research questions and disseminate research results ethically along with academic principles to the public. Following are expected learning outcomes for the dissertation project.

5.2.1 Demonstrate ethics, responsibility with teamwork and leadership skills

5.2.2 Integrate knowledge in physiology and related fields for knowledge transfer/innovation and problem-solving;

5.2.3 Create research in physiology and related fields to produce international peer-reviewd publications, patents, and/or innovations;

5.2.4 Deliver specific and generalizable knowledge effectively by using various means of communication.

5.3 Time Frame

Plan 2 Course work and Research

Plan 2.1: For students with Master's Degree
Start from the 1st semester of the 2nd academic year

Plan 2.2: For students with Bachelor's Degree
Start from the 2nd Semester of the 2nd Academic Year

5.4 Number of credits

Plan 2 Course work and Research

Plan 2.1:	For students with Master's Degree	36 Credits
Plan 2.2:	For students with Bachelor's Degree	48 Credits

5.5 Preparation

Students must register for the dissertation course following the curriculum plan. Students, in consultation with the dissertation advisor, ask for approval for the establishment of a proposal advisor via the Online Dissertation System of the Faculty of Graduate Studies. Students who develop a research project based on animals or human subjects need to submit the research protocol for approval before starting the dissertation project.

5.6 Evaluation Process

For dissertation progress evaluation, students will report the progress of their theses by presenting their research progress in the department's seminar series. For graduation processes, the final oral examination is systematically evaluated by the individual program committees appointed by the Faculty of Graduate Studies, Mahidol University. In addition, the research work or part(s) of the student's dissertation must be published in an international peer-review journal.

Section 4 Learning Outcome, Teaching Strategies and Evaluation

1. Development of Students' Specific Qualifications

Special Characteristics	Teaching Strategies or Student Activities
- Teamwork skills - Communication skills	- The students are required to attend extracurricular activities organized by the department including special seminars, research forums and student competency development seminars, or activities organized by Mahidol University such as Prince Mahidol day at least once a year. Students are required to participate in these activities at least once a year.

2. Development of Learning Outcome in Each Objective

Expected Outcome	Teaching Strategies	Evaluation Strategies
1. Ethics 1) Perform duties with professional ethics 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) Dissertation project	1) Quality of assignment 2) Report evaluation and plagiarism assessment 3) Certificates of attendance 4) Dissertation committee evaluation 5) Evaluation by external peer review of publication
2. Knowledge 1) Understand knowledge in physiology 2) Able to acquire and update additional knowledge of the related fields	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 instructors and course co-ordinator
3. Intellectual Development 1) Able to analyze and synthesize knowledge in physiology 2) Create and develop knowledge and innovation on physiology	1) Group discussion 2) Analysis of case studies 3) Seminar 4) Project assignment 5) Dissertation 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

Expected Outcome	Teaching Strategies	Evaluation Strategies
		3) Dissertation committee evaluation
4. Interpersonal Relationship and Responsibility 1) Work with responsibility 2) Ability to work as a team with peers 3) Ability to lead the team	1) Group participation 2) Group discussion with both leader and team member roles 3) Group Assignment 4) Extracurricular activities 5) Dissertation	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) Dissertation committee evaluation
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) Dissertation project 3) Small group discussion and presentation 4) Interactive lecture	1) Behavior observation in classrooms and laboratories 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 proceeding or international publication 6) Dissertation committee evaluation

3. Curriculum Mapping

Please see Appendix C**.**

Section 5 Criteria for Student Evaluation

1. Grading System

The grading system and graduation shall comply with the criteria stated in the regulations of the 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 follows

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

(2) The symbols without scores

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

Symbol	Meaning
AU	Audit
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 Department of Physiology annual strategic planning

3. Graduation Requirement

Plan 2 Coursework and research

3.1 Plan 2.1: For students with Master's Degree

3.1.1 Total time of study should not exceed the study plan

3.1.2 Students must complete all courses (not less than 12 credits) and dissertation (36 credits) as stated in the curriculum with a minimum CUM-GPA of 3.00

3.1.3 Pass the qualifying examination

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

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

3.1.6 Students must submit the dissertation and pass the open dissertation oral examination following the Regulations of Mahidol University on Graduate Studies.

3.1.7 Dissertation or part(s) of student's dissertation are required to publish at least 1 paper in a international peer-reviewed academic journals of a quality that has been approved by Office of the Higher Education Commission on Academic Journal Consideration Criteria for Disseminating Academic Output. The student must be the first author of the publication.

3.2 Plan 2.2: For students with Bachelor's Degree

3.2.1 Total time of study should not exceed the study plan

3.2.2 Students must complete all courses (not less than 24 credits) and dissertation (48 credits) as stated in the curriculum with a minimum CUM-GPA of 3.00.

3.2.3 Pass the qualifying examination

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

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

3.2.6 Students must submit the dissertation and pass the open dissertation oral examination following the Regulations of Mahidol University on Graduate Studies.

3.2.7 Dissertation or part(s) of student's dissertation are required to publish at least 1 paper in a international peer-reviewed academic journals of a quality that has

been approved by Office of the Higher Education Commission on Academic Journal Consideration Criteria for Disseminating Academic Output. The student must be the first author of the publication.

Section 6 Faculty Development

1. The Orientation for New Faculty Members

1.1 New full-time and part-time faculty members are trained to acknowledge and understand the curriculum.

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

1.3 New faculty members are informed about the dissertation advisory processes according to 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 Support on attending the activities organized by MU's class on teaching performance development.

2.1.2 Encourage participation in teaching and learning development activities organized by both internal and external agencies.

2.2 Other Academic and Professional Skill Development

2.2.1 Support for developmental needs, i.e., attending conferences both at national and international levels

2.2.2 Provide partial funding support for research work and presentation at academic conferences

2.2.3 Encourage on attending training 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. Course syllabus and lesson plans are provided for all courses along with evaluation after the end of the course to improve the teaching and learning experiences of the students. In addition, there is a regular meeting to plan teaching and learning strategies for all courses prior to the start of the semester.

2. Graduates

The graduate students of the physiology program are trained in a curriculum that assure to meeting a high quality of education and international standards. The development of curriculum and courses rely on both the Thai Qualification Framework for Higher Education and feedbacks from 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

The qualifications of instructors are required 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 contribute to and fulfill the curriculum planning and development. For course organization, the assigned instructor is responsible for the course content including course schedule, syllabus, and evaluation methods. Course progress is reported as a regular agenda item in the department's meeting. Instructors who participate in the course organization providing their opinions on with the teaching and learning issues and receive feedback to assure that the course meets the quality of higher education.

5. Program, Study and Student Assessment

The qualifications of the curriculum meet the criteria of the Thai Qualification Framework for Higher Education B.E. 2558. Student assessment during the study in the program is aligned with Program Learning Outcomes (PLOs). The rubric assessment system is applied to the course contents related to discussion and presentation. Course and instructor evaluations by students are monitored by the course coordinator and program director to be used for the improvement of courses and teaching quality. The program

director on reports the ongoing activities and student progress in the curriculum on a monthly basis. Additionally, student satisfaction of the curriculum is evaluated annually during the Department of Physiology Strategic Planning and this information will be used for the further curriculum development.

6. Learning Support

The curriculum provides the laboratory instruments to support the learning outcomes of students related to physiology knowledge and research. The Faculty also provides a unit that meets international standards for training such as Central Animal Facility (CAF), which was accredited by Laboratory Animal Care International (AAALAC). To facilitate research activities, all students are eligible to use the instruments and services from the Central Instrument Facility (CIF) and Central Nanoimaging (CNI) unit of the Faculty of Science.

Additionally, the central library of Faculty of Science, Mahidol University (Stang Mongkolsuk Library) has the necessary textbook and research publications available, for students to access in support of their study and research.

7. Key Performance Indicators

The Physiology program, Department of Physiology divides key performance based on the curriculum that meets the standards of Thai Qualifications Framework as follows: (1) the compulsory performance indicators (numbers 1-5) must pass beyond expectations and (2) the total number of performance indicators must reach their goal by no less than 80 percent each year. The Key Performance Indicators are as follows:

Key Performance Indicators	Academic Year				
	2023	2024	2025	2026	2027
1. At least 80% of all full-time instructors in each program have to participate in meetings that set up plans to evaluate and revise the curriculum.	✓	✓	✓	✓	✓
2. The program must have the details of the curriculum according to TQF2 which is associated with the Thai Qualifications Framework or the standards of the program (if any)	✓	✓	✓	✓	✓
3. The program must have course specifications and field experience specifications (if any) according to TQF3 before the beginning of each semester	✓	✓	✓	✓	✓
4. Instructors must produce course reports and file experience reports (if any) according to TQF5 within 30 days after the end of the semester.	✓	✓	✓	✓	✓

Key Performance Indicators	Academic Year				
	2023	2024	2025	2026	2027
5. Instructors must produce program reports according to TQF7 within 60 days after the end of the academic year	✓	✓	✓	✓	✓
6. Instructors must revise the grading of students according to learning standards indicated in TQF3 for at least 25 percent of courses that are offered each academic year.	✓	✓	✓	✓	✓
7. Instructors must assess the development and/or improvement of teaching methods, teaching techniques, or the grading system from the evaluation results in TQF 7 of the previous year.		✓	✓	✓	✓
8. Every new instructor (if any) has to participate in the orientation and receive adequate information on the college's teaching requirements.	✓	✓	✓	✓	✓
9. Full-time instructors must demonstrate academic and/or professional improvement at least once a year.	✓	✓	✓	✓	✓
10. The number of supporting staff (if any) who demonstrate academic and/ or professional improvement by at least 50 percent each year.	✓	✓	✓	✓	✓
11. The level of satisfaction from the previous year's students and new graduates toward curriculum quality, with an average score of at least 3.5 out of 5	-	-	✓	✓	✓
12. The level of satisfaction from employers of new graduates with an average score of at least 3.5 out of 5	-	-	-	✓	✓
13. Instructors have been evaluated by students after teaching at 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 towards 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 towards courses and instructors

1.2.2 Evaluation from senior instructors

2. Overall Evaluation of the Curriculum

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

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

2.3 Curriculum evaluation from external experts

3. valuation 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 member 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 new 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 for the program to the Faculty of Graduate Study

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

Analyzing and critiquing basic research in physiology; presenting the research rationale, experimental approach, and presenting key findings; techniques in handling discussion and questions.

การวิเคราะห์และวิจารณ์งานวิจัยพื้นฐานด้านสรีรวิทยา นำเสนอสาระสำคัญ ที่มาของประเด็นปัญหา วิธีการวิจัย ผลการวิจัย เทคนิคการอภิปรายให้ข้อคิดเห็นและตอบข้อซักถาม

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

Analyzing and critiquing advanced research in physiology; presenting the research rationale, experimental approach, and presenting key findings; techniques in handling discussion and questions.

วิเคราะห์และวิจารณ์งานวิจัยด้านสรีรวิทยาขั้นสูง นำเสนอสาระสำคัญ ที่มาของประเด็นปัญหา วิธีการวิจัย ผลการวิจัย จากบทความวิจัยทางสรีรวิทยา เทคนิคการอภิปรายให้ข้อคิดเห็นและตอบข้อซักถาม

Credits (lecture – practice – self-study)

SCPS 608 Physiology Seminar III 1(1-0-2)

วทสร ๖๐๘ สัมมนาสรีรวิทยา ๓

Analyzing, criticizing, presenting key findings, research rationale experimental approach, results from frontier/cutting edge articles in physiology; intergrate knowledge in physiology with related discipline; techniques in discussion and question handling.

วิเคราะห์ วิจารณ์และนำเสนอสาระสำคัญ ที่มาของประเด็นปัญหา วิธีการวิจัย ผลการวิจัยจากบทความวิจัยแนวหน้าทางสรีรวิทยาที่มีความลึกซึ้งและซับซ้อนเทคนิค เชื่อมโยงความรู้ด้านสรีรวิทยากับสาขาที่เกี่ยวข้อง การอภิปรายให้ข้อคิดเห็น และตอบข้อซักถาม

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 ข้อปฏิบัติด้านจริยธรรมการเขียนทางวิทยาศาสตร์

SCPS 679 Advanced Topics in Physiology 3(3-0-6)

วทสร ๖๗๙ หัวข้อทางสรีรวิทยาขั้นสูง

Advanced and current topics in physiology; application and integration of physiology knowledge with other disciplines, new technologies in physiology and related field; omics technology to address research in physiology; bioinformatics analysis.

ความรู้ปัจจุบันและขั้นสูงเกี่ยวกับสรีรวิทยาระบบต่าง ๆ การประยุกต์และความเชื่อมโยงความรู้ทางสรีรวิทยากับศาสตร์อื่นๆ หัวข้อปัจจุบันทางสรีรวิทยา เทคโนโลยีใหม่ทางสรีรวิทยาหรือศาสตร์ที่เกี่ยวข้อง เทคโนโลยีโอมิคเพื่องานวิจัยด้านวิจัยด้านสรีรวิทยา การวิเคราะห์โดยใช้ความรู้ด้านชีวสารสนเทศ

Credits (lecture – practice – self-study)

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; regulation system; coordination of these systems to maintain the homeostasis of internal environment in response to fluctuations in the external environment.

กลไกการทำงานของเซลล์ ระบบประสาท กล้ามเนื้อและระบบไหลเวียนโลหิต ระบบการควบคุม 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; regulation system; coordination of these systems to maintain the homeostasis of internal environment in response to fluctuations in the external environment.

กลไกการทำงานของระบบหายใจ ระบบไต ระบบย่อยอาหาร ระบบต่อมไร้ท่อ และระบบสืบพันธุ์ ระบบการควบคุม การทำงานที่สอดประสานกันของระบบต่าง ๆ เพื่อการทรงสภาพปกติของสภาวะแวดล้อมภายในกายต่อการถูกรบกวนจากสภาวะแวดล้อมภายนอก

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

วทสร ๖๙๑ 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 หลักการและการประยุกต์วิธีการทางสถิติเพื่อการตั้งสมมุติฐาน การออกแบบงานทดลอง และการประเมินผลในงานวิจัย การใช้วิธีการวิเคราะห์ทางชีวสถิติสำหรับงานวิจัยระดับชีวโมเลกุลและเซลล์ที่เกี่ยวข้องกับการวิเคราะห์ภาพ การวัดทางชีวเคมี และงานทางชีวสารสนเทศ การคำนวณหาจำนวนสัตว์ที่เหมาะสมในงานวิจัย การวิเคราะห์ข้อมูลเชิงชีวสถิติที่ใช้บ่อยในงานวิจัยที่ใช้สัตว์ทดลอง สถิติสำหรับงานวิจัยในมนุษย์

Credits (lecture – practice – self-study)

SCPS 695 Research Methodology, Management, Communication and Grantsmanship 2(2-0-4)

วทสร ๖๙๕ วิทยาระเบียบวิธีวิจัย การจัดการ การสื่อสารและการหาทุนวิจัย

Research methodology, management skills in research, scientific communication skills, guidelines and techniques for scientific presentations, key factors for successful in scientific communication, guidelines and techniques for grant proposals writing and pitching.

วิทยาระเบียบวิธีวิจัย ทักษะการบริหารงานวิจัย ทักษะการสื่อสารทางวิทยาศาสตร์ แนวทางและเทคนิคการนำเสนอผลงานวิจัย ปัจจัยสำคัญต่อการประสบความสำเร็จในการนำเสนอผลงานวิจัย แนวทางและเทคนิคการเขียนข้อเสนอโครงการวิจัยเพื่อขอทุนวิจัย แนวทางและเทคนิคการนำเสนอโครงการวิจัยเพื่อให้ได้รับการสนับสนุน

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

SCID 502 Cell Science 2(2-0-4)

วทคร ๕๐๒ วิทยาศาสตร์เรื่องเซลล์

Mechanism of cellular trafficking and processing among organelles, cellular communication, recognition, adhesion and interaction, cell cycle and controls of cellular differentiation and cancer, cellular signal transduction, cellular response to stress, cell injury, senescence, and cell death, cell-microbe interaction, cellular immune responses, molecular pathogenesis of some diseases.

กลไกของเซลล์ในการขนส่งและแปรรูปชีวโมเลกุลไปยังอวัยวะเซลล์ การติดต่อสื่อสาร การรับรู้ การเกาะเกี่ยวกัน และการปฏิสัมพันธ์ระหว่างเซลล์ วัฏจักรของเซลล์และการควบคุมการเปลี่ยนสภาพของเซลล์และมะเร็ง การส่งสัญญาณภายในเซลล์ การตอบสนองของเซลล์ต่อภาวะเครียด การบาดเจ็บ การชราและการตายของเซลล์ การปฏิสัมพันธ์ระหว่างเซลล์กับจุลชีพ การตอบสนองของระบบภูมิคุ้มกันของเซลล์ พยาธิกำเนิดในระดับโมเลกุลของโรคบางชนิด

Credits (lecture – practice – self-study)

SCID 506 Concepts of Molecular Bioscience 2(2-0-4)

วทคร ๕๐๖ หลักการทางวิทยาศาสตร์ชีวภาพระดับโมเลกุล

Biochemical and biophysical knowledge underlying various processes of living systems, structures and functions of biological molecules, manipulation of energy and metabolites are in biological systems, regulation and expression process of genetic materials.

ความรู้ทางชีวเคมีและชีวฟิสิกส์ของกระบวนการต่าง ๆ ในสิ่งมีชีวิต โครงสร้างและหน้าที่ของ ชีวโมเลกุล การสร้างและการใช้พลังงานในกระบวนการต่าง ๆ ของสิ่งมีชีวิต กระบวนการควบคุมและการแสดงออกของสารพันธุกรรม

SCID 508 Biomolecular and Spectroscopy Techniques 1(0-2-1)

วทคร ๕๐๘ เทคนิคด้านชีวโมเลกุลและด้านสเปกโทรสโกปี

Absorbance and fluorescence spectroscopy, mass spectroscopy, nuclear magnetic resonance (NMR) spectroscopy and biomolecular spectroscopy, laboratory rules and regulations.

สเปกโทรสโกปีชนิดดูดกลืนแสงและฟลูออเรสเซนท์ แมสสเปคโทรโสกปี สเปกโทรสโกปีชนิดนิวเคลียร์แมกเนติกเรโซแนนซ์ และสเปกโทรสโกปีทางชีวโมเลกุลคู่ กฎและระเบียบการใช้ห้องปฏิบัติการ

SCID 510 Immunological Methods 1(0-2-1)

วทคร ๕๑๐ ระเบียบวิธีวิทยาภูมิคุ้มกัน

Basic principles and applications of immunological methods enzyme-linked immunosorbent assay, SDS- PAGE and immunoblotting, direct and indirect immunofluorescence assays, immunoelectron microscopy, immunoprecipitation, peripheral blood mononuclear cell preparation, flow cytometry and cell sorting, laboratory rules and regulations.

หลักการพื้นฐานและการประยุกต์ระเบียบวิธีทางวิทยาภูมิคุ้มกัน เอนไซม์ลิงค์อิมมูนโนสอร์เบนท์ เอสดีเอส-เพจ และ การทำอิมมูนโนบลอท การทำอิมมูนโนฟลูโอเรสเซน ตรง และ อ้อม การทำอิมมูนโนอิเล็กตรอนไมโครสโคปี การทำอิมมูนโนพรีซิพพิเทชั่น ปฏิบัติการเตรียมเซลล์นิวเคลียสเดี่ยวจากเลือดปฏิบัติการโฟลไซโตเมททรี และ การแยกเซลล์ กฎและระเบียบการใช้ห้องปฏิบัติการ

Credits (lecture – practice – self-study)

SCID 511 Gene Technology 1(0-2-1)
วทคร ๕๑๑ เทคโนโลยีด้านยีน

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

เทคนิคการจัดการยีนและการตัดต่อยีน หลักการเทคโนโลยีด้านยีน โครงการทดลองย่อยที่เกี่ยวข้องกับกรดนิวคลิอิกและโปรตีน การประเมินคุณภาพของข้อมูลจากผลการทดลอง กฎและระเบียบการใช้ห้องปฏิบัติการ

SCID 512 Receptor Binding and Enzyme Kinetic Assays 1(0-2-1)
วทคร ๕๑๒ การสอบปริมาณการจับตัวรับและเอนไซม์เชิงจลน์

Receptor- drug interaction, receptor preparation, saturation binding experiment, characterization of drugs and receptors by competitive binding experiments, analysis of binding data using computerized program, techniques in enzyme kinetic analysis, analytical enzymology, laboratory rules and regulations.

ปฏิกิริยาระหว่างตัวรับและยา การเตรียมตัวรับ การทดลองการจับยึดชนิดอิ่มตัว การตรวจสอบลักษณะเฉพาะของยา และตัวรับโดยการทดลองแย่งจับยึดการวิเคราะห์ข้อมูลการจับ โดยใช้โปรแกรมคอมพิวเตอร์ เทคนิคการวิเคราะห์เชิงจลน์ของเอนไซม์ เอนไซม์วิทยาเชิงวิเคราะห์ กฎและระเบียบการใช้ห้องปฏิบัติการ

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 668 Metabolic Responses to Exercise and Environmental Stress 1(1-0-2)
วทสร ๖๖๘ การตอบสนองทางเมแทบอลิซึมต่อการออกกำลังกายและความเครียดจากสภาวะแวดล้อม

Mechanisms underlying the metabolic and biochemical responses to acute exercise and adaptations with chronic exercise and environmental stress; regulation of body temperature and body fluid during exercise and environmental stress; body response to high altitude

กลไกการตอบสนองทางเมแทบอลิซึมและชีวเคมีต่อการออกกำลังกายแบบเฉียบพลันและการปรับตัวต่อการออกกำลังกายแบบต่อเนื่องและความเครียดจากสภาวะแวดล้อม การควบคุมอุณหภูมิและของเหลวในร่างกายขณะออกกำลังกายและขณะเผชิญความเครียดจากสภาวะแวดล้อม การตอบสนองของร่างกายต่อการเปลี่ยนระดับความสูงของสภาพแวดล้อม

Credits (lecture – practice – self-study)

SCPS 676 Physiology of Aging 1(1-0-2)

วทสร ๖๗๖ สรีรวิทยาการชราภาพ

Biological principles and theories that underlie the phenomena of human aging; normal aging processes; aged-related health conditions; exercise training and prescription for elderly; exercise instrument and physical fitness testing in elderly

หลักการและทฤษฎีทางชีววิทยาที่เป็นพื้นฐานของการชราภาพในมนุษย์ กระบวนการการชราภาพทั่วไป การชราภาพกับสภาวะสุขภาพ ผลของการออกกำลังกายและแบบฝึกการออกกำลังกายในผู้สูงอายุ อุปกรณ์การออกกำลังกายและการวัดสมรรถภาพทางกายในผู้สูงอายุ

SCPS 687 Health Risk Appraisal in Fitness Facility 2(2-0-4)

วทสร ๖๘๗ การประเมินความเสี่ยงด้านสุขภาพในสถานที่ออกกำลังกาย

Risk management guidelines for a fitness facility; emergency procedures in a fitness setting; initial management and first-aid procedures for exercise-related injuries; basic life support; cardiopulmonary resuscitation; automated external defibrillator techniques

แนวทางการบริหารความเสี่ยงสำหรับสถานที่ออกกำลังกาย แผนรองรับเหตุฉุกเฉิน การจัดการและปฐมพยาบาลเบื้องต้นเมื่อเกิดการบาดเจ็บจากการออกกำลังกาย การช่วยชีวิตขั้นพื้นฐาน การปั๊มหัวใจ วิธีการใช้เครื่องกระตุ้นไฟฟ้าหัวใจแบบอัตโนมัติ

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

SCPS 801 Health Risks and Exercise Management in the Elderly 2(2-0-4)
วทสร ๘๐๑ ความเสี่ยงด้านสุขภาพและการจัดการการออกกำลังกายในผู้สูงอายุ

Health risk in the elderly during exercise, risk assessment due to exercise in the elderly, exercise prescription for the elderly

ความเสี่ยงจากการออกกำลังกายในผู้สูงอายุ การจัดการความเสี่ยงจากการออกกำลังกายในผู้สูงอายุ รูปแบบการออกกำลังกายที่เหมาะสมสำหรับผู้สูงอายุ

Credits (lecture – practice – self-study)

3) Dissertation

SCPS 699 Dissertation 36(0-108-0)
วทสร ๖๙๙ วิทยานิพนธ์

การออกแบบและกำหนดโครงการวิจัย การเสนอเค้าโครงวิจัย การศึกษาวิจัยอย่างมีจริยธรรม การคัดกรองข้อมูล การวิเคราะห์ข้อมูล การสังเคราะห์และวิพากษ์ผลการวิจัย การนำผลการวิจัยมาเรียบเรียงเป็นวิทยานิพนธ์ การนำเสนอวิทยานิพนธ์ การเรียบเรียงผลงานวิจัยเพื่อเผยแพร่ การเผยแพร่ผลงานวิจัยในวารสารวิชาการระดับนานาชาติ จริยธรรมในการเผยแพร่ผลงานวิจัย

Identifying research proposal. Conducting research with concern of research ethics. Data Collection, analysis, interpretation of the result and report the result in terms of thesis. Presenting and Publishing research in international peer-reviewed journal, ethics in dissemination of the research results.

Credits (lecture – practice – self-study)

SCPS 799 Dissertation 48(0-144-0)

วทสร ๗๙๙ วิทยานิพนธ์

การออกแบบและกำหนดโครงการวิจัย การเสนอเค้าโครงวิจัย การศึกษาวิจัยอย่างมีจริยธรรม การคัดกรองข้อมูล การวิเคราะห์ข้อมูล การสังเคราะห์และวิพากษ์ผลการวิจัย การนำผลการวิจัยมาเรียบเรียงเป็นวิทยานิพนธ์ การนำเสนอวิทยานิพนธ์ การเรียบเรียงผลงานวิจัยเพื่อเผยแพร่ การเผยแพร่ผลงานวิจัยในวารสารวิชาการระดับนานาชาติ จริยธรรมในการเผยแพร่ผลงานวิจัย

Identifying research proposal. Conducting research with concern of research ethics. Data Collection, analysis, interpretation of the result and report the result in terms of thesis. Presenting and Publishing research in international peer-reviewed journal, ethics in dissemination of the research results.

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 and Biophysics	University of Illinois at Chicago, USA.	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 683 Professional Communication Skills	2(1-2-3)
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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

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 young growing rats is associated with widespread osteopenia and impaired bone mineralization. Sci Rep. 2020;10(1):15079	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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 proteoglycans in the epiphyseal cartilage of bromocriptine-treated pregnant and lactating rats. Anat Sci Int. 2020;95(2):277-85.	12/1	2020
	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,	12/1	2019

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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.		
	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 inhibiting intestinal calcium absorption: hormones and luminal factors that prevent excessive calcium uptake. J Physiol Sci. 2019;69(5):683-96.	12/1	2019
	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.	12/1	2019

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Effects of probiotics, prebiotics or synbiotics on jawbone in obese-insulin resistant rats. Eur J Nutr. 2019;58(7):2801–2810.		
	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
	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 Physiology II	3(3-0-6)
27	SCPS 683 Professional Communication Skills	2(1-2-3)
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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

3. Name: Associate Professor Dr. Arthit Chairoungdua

Education

Degree	Degree Name	Institute	Year of Graduation
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

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
	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*.	12/1	2021

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Boesenmaxane diterpenoids from Boesenbergia maxwellii. J Nat Prod 2021 Feb;84(2):518-26.		
	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
	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

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	Kitdumrongthum S, Reabroi S, Suksen K, Tuchinda P, Munyoo B, Mahalapbutr P, Rungrotmongkol T, Ounjai P, **Chairoungdua A***. Inhibition of topoisomerase IIα 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 scaffold derived from intact planarian body. Zool Sci 2020 Aug;37(4):307-13.	12/1	2020
	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 683 Professional Communication Skills	2(1-2-3)
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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

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 Marrow-Derived Mesenchymal Stem Cells by a Phytoestrogen Diarylheptanoid from *Curcuma comosa*. J Agric Food Chem 2020 Sep 16;68(37):9993-10002.	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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 cholangiocytes. Hepatology 2019 Feb;69(2):817-30.	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 683 Professional Communication Skills	2(1-2-3)
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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)

15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

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. (Hons.)	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
	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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)

6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

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 organic cation drugs in hepatocellular carcinoma cells. Fundam Clin Pharmacol 2020 Jun;34(3):365-79.	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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 683 Professional Communication Skills	2(1-2-3)
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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

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.	-	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 Physiol Regul Integr Comp Physiol 2020 May;318(5):R829-R42.	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)

15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

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 patients with stroke characterized by subtraction operation difficulties. Front Neurol 2020 Apr;11:262.	12/1	2020

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

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 683 Professional Communication Skills	2(1-2-3)
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 608 Physiology Seminar III	1(1-0-2)

4	SCPS 609 Scientific Paper Analysis and Writing	1(0-2-1)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

10. 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 683 Professional Communication Skills	2(1-2-3)

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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(0-2-1)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

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-13R expands human umbilical cord blood hematopoietic stem and progenitor cells in vitro. Molecules 2021 Apr;26(7):1995.	12/1	2021

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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 683 Professional communication skills	2(1-2-3)
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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)

7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
	SCPS 680 Systems Physiology I	3(3-0-6)
8	SCPS 681 Systems Physiology II	3(3-0-6)
9	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
10	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
11	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
12	SCPS 693 Technology entrepreneurship	1(0-2-1)
13	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
14	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
15	SCPS 699 Dissertation	36(0-108-0)
16	SCPS 799 Dissertation	48(0-144-0)

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
	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	12/1	2019

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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.		
	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 608 Physiology Seminar III	1(1-0-2)

4	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
	SCPS 680 Systems Physiology I	3(3-0-6)
8	SCPS 681 Systems Physiology II	3(3-0-6)
9	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
10	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
11	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
12	SCPS 693 Technology entrepreneurship	1(0-2-1)
13	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
14	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
	SCPS 699 Dissertation	36(0-108-0)
	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

13. Name: 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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)

5	SCPS 676 Physiology of Aging	1(1-0-2)
6	SCPS 609 Scientific Paper Analysis and Writing	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)
8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

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 Biophys Res Commun 2020 Mar;523(3):816-821.	12/1	2020
	Charoenphandhu N, **Aeimlapa R**, Sooksawanwit S, Thongbunchoo J, Teerapornpuntakit J, Svasti S, Wongdee K.	12/1	2019

Types of Academic Work	Title	Standard Criteria and Weights	Year of Publication
	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.		

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 608 Physiology Seminar III	1(1-0-2)
4	SCPS 609 Scientific Paper Analysis and Writing	1(0-2-1)
5	SCPS 668 Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)
6	SCPS 676 Physiology of Aging	1(1-0-2)
7	SCPS 679 Advanced Topics in Physiology	3(3-0-6)

8	SCPS 680 Systems Physiology I	3(3-0-6)
9	SCPS 681 Systems Physiology II	3(3-0-6)
10	SCPS 687 Health Risk Appraisal in Fitness Facility	2(2-0-4)
11	SCPS 691 Biostatistics for Physiology and Biomedical Research	2(2-0-4)
12	SCPS 692 Fundamentals Biomedical Innovation	1(1-0-2)
13	SCPS 693 Technology entrepreneurship	1(0-2-1)
14	SCPS 694 Development of Drugs and Nutraceutical Products	2(2-0-4)
15	SCPS 695 Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)
16	SCPS 699 Dissertation	36(0-108-0)
17	SCPS 799 Dissertation	48(0-144-0)
18	SCPS 801 Health Risks and Exercise Management in the Elderly	2(2-0-4)

APPENDIX C

Curriculum Mapping

Appendix C
Curriculum Mapping

● 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 **Plan 2 Coursework and Research** **Plan 2.1: For students with Master's Degree**												
SCPS 608 Physiology Seminar III	●	●	●	●	●	●	●	o	●	●	●	●
SCPS 679 Advanced Topics in Physiology	o	●	●	●	●	●	●	●	●	●	●	●
SCPS 695 Research Methodology, Management, Communication and Grantsmanship	●	●	o	o	●	o	●	o	●	●	●	●
2) Required courses **Plan 2.2: For students with Bachelors Degree**												
SCID 518 Generic Skills in Science Research	●	●	●	●	o	o	●	●	●	●	●	●
SCPS 606 Physiology Seminar I	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 607 Physiology Seminar II	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 608 Physiology Seminar III	●	●	●	●	●	●	●	o	●	●	●	●
SCPS 609 Scientific Paper Analysis and Writing	●	●	●	o	●	●	●	●	●	●	●	●
SCPS 679 Advanced Topics in Physiology	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 680 Systems Physiology I	●	●	●	●	●	●	●	●	●	○	●	●
SCPS 681 Systems Physiology II	●	●	●	●	●	●	●	●	●	○	●	●
SCPS 691 Biostatistics for Physiology and Biomedical Research	●	●	●	○	●	●	●	●	○	●	●	●
SCPS 695 Research Methodology, Management, Communication and Grantsmanship	●	●	○	○	●	○	●	●	●	●	●	●
3) Elective courses												
SCID 500 Cell and Molecular Biology	●	●	●	●	●	●	●	○	○	●	●	●
SCID 502 Cell Science	●	●	●	●	●	●	●	○	●	●	●	●
SCID 506 Concepts of Molecular Bioscience	●	●	●	●	●	●	●	○	○	●	●	●
SCID 508 Biomolecular and Spectroscopy Techniques	●	●	●	●	●	●	●	●	●	●	●	●
SCID 510 Immunological Methods	●	●	●	●	●	●	●	●	●	●	●	●
SCID 511 Gene Technology	●	●	●	●	●	●	●	●	●	●	●	●
SCID 512 Receptor Binding and Enzyme Kinetic Assays	●	●	●	●	●	●	●	●	●	●	●	●
SCID 514 Animal Experimentation in Biomedical Research	●	●	●	●	●	●	●	●	●	●	●	●

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 668 Metabolic Responses to Exercise and Environmental Stress	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 676 Physiology of Aging	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 687 Health Risk Appraisal in Fitness Facility	●	●	●	●	●	o	●	●	●	●	●	●
SCPS 692 Fundamental Biomedical Innovation	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 693 Technology Entrepreneurship	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 694 Development of Drugs and Nutraceutical Products	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 801 Health Risks and Exercise Management in the Elderly	●	●	●	●	●	o	●	●	●	●	●	●
1) **Dissertation**												
SCPS 699 Dissertation	●	●	●	●	●	●	●	●	●	●	●	●
SCPS 799 Dissertation	●	●	●	●	●	●	●	●	●	●	●	●

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 update additional knowledge of the related fields	Mastery
3. Intellectual Skills	
3. 1 Able to analyze and synthesize knowledge in physiology	Mastery
3. 2 Create and develop knowledge and innovation on physiology	Mastery, Originality
4. International Relationship and responsibility	
4.1 Work with responsibility	Mastery, Determination
4.2 Ability to work as a team with peers 4.3 Ability to lead the team	Harmony Leadership.
5. Mathematical Analytical Thinking, Communication Skills, and Information	
5.1 Effective Mathematical analytical thinking	Mastery
5.2 Ability in communication, and presentation 5.3 Ability to transfer the knowledge effectively using information technology (IT) skills	Mastery 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 the professional ethics and morals
Have knowledge of physiology principles in both theory and practice	Have in-depth knowledge of physiology and related fields
Analyze, criticize and perform research in physiology for publication	Establish novel research in physiology and related fields with international standards
Have team work skills, leadership skills and be responsible for the assigned tasks	Have responsibility, leadership, and the ability to work with the others
Use information technology to search, collect, communicate, transfer knowledge effectively	Have the ability of mathematical analysis and information technology for effective communications

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 the professional ethics and morals	✓				
2. Have in-depth knowledge of physiology and related fields		✓			
3. Establish novel research in physiology and related fields with international standards			✓		
4. Have responsibility, leadership, and the ability to work with the others				✓	
5. Have the ability of mathematical analysis and information technology for effective communications					✓

*PLO1 Demonstrate moral and professional ethics
PLO2 Integrate knowledge in physiology and related fields for knowledge transfer/innovation and problem solving

PLO3 Create research in physiology and related fields to produce international publications, patents or innovations

PLO4 Demonstrate responsibility, leadership, and the ability to work with the others

PLO5 Deliver specific and generalizable knowledge effectively by using various means of communication

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	✓				
	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 update additional knowledge of the related fields		✓			
Intellectual Development	3.1 Able to analyze and synthesize knowledge in physiology			✓		
	3.2 Create and develop knowledge and innovation on physiology			✓		
Interpersonal Relationship and Responsibility	4.1 Work with reliable habits and responsibility				✓	
	4.2 Ability to work as a team with peers				✓	
	4.3 Ability to lead the team				✓	
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 moral and professional ethics	1) Interactive lecture 2) Group/individual assignment 3) Assignment/Laboratory report 4) Project assignment 5) Disseration project	1) Quality of assignment 2) Report evaluation and plagiarism assessment 3) Certificates of attendance 4) dissertation committee evaluation 5) Evaluation by peer review
PLO2 Integrate knowledge in physiology and related fields for knowledge transfer/innovation and problem solving	1) Interactive lecture 2) Case Studies/Discussion 3) Seminar 4) Disseration project	1) Written examination 2) Quality of assignment 2) Report evaluation 4) Dissertation committee evaluation 5) Evaluation by peer review
PLO3 Create research in physiology and related fields to produce international publications, patents or innovations	1) Interactive lecture 2) Laboratory training 3) Case Studies/Discussion 4) Seminar 5) Dissertation project	1) Written examination 2) Quality of assignment 3) Report evaluation 4) Hands-on demonstration 5) Dissertation committee evaluation 6) Evaluation by peer review
PLO4 Demonstrate responsibility, leadership, and the ability to work with the others,	1) Seminar 2) Dissertation project 3) Small group discussion and presentation	1) Behavior observation in classrooms and laboratories 2) Evaluation of group discussion and presentation by rubrics 3) Evaluation of seminar participation and presentation by rubrics
PLO5 Deliver specific and generalizable knowledge effectively by using various means of communication	1) Seminar 2) Dissertation project 3) Small group discussion and presentation 4) Interactive lecture	1) Behavior observation in classrooms and laboratories 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 proceeding or international publication 6) Disseration committee evaluation

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

Code	Name	Credits	PLOs				
			1	2	3	4	5
1) Required Courses **Plan 2 Coursework and Research** **Plan 2.1: For students with Master's Degree**							
SCPS 608	Physiology Seminar III	1(1-0-2)	P	P	P	P	P
SCPS 679	Advanced Topics in Physiology	3(3-0-6)	P	P	P	P	P
SCPS 695	Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)	P			P	P
Plan 2.2: For students with Bachelor's Degree							
SCID 518	Generic Skills in Science Research	1(1-0-2)	I	I	I	I	I
SCPS 680	Systems Physiology I	3(3-0-6)	R	R		R	R
SCPS 681	Systems Physiology II	3(3-0-6)	R	R		R	R
SCPS 691	Biostatistics for Physiology and Biomedical Research	2(2-0-4)	R		R	R	R
SCPS 606	Physiology Seminar I	1(1-0-2)	R	R	R	R	R
SCPS 609	Scientific Paper Analysis and Writing	1(1-0-2)	R		R	R	R
SCPS 679	Advanced Topics in Physiology	3(3-0-6)	R	R	R	R	R
SCPS 695	Research Methodology, Management, Communication and Grantsmanship	2(2-0-4)	R			R	
SCPS 607	Physiology Seminar II	1(1-0-2)	R	R	R	R	R
SCPS 608	Physiology Seminar III	1(1-0-2)	P	P	P	P	P
2) Elective Courses							
SCID 500	Cell and Molecular Biology	3(3-0-6)	I	I	I	I	I
SCID 502	Cell Science	2(2-0-4)	R	R	I	R	R
SCID 506	Concepts of Molecular Bioscience	2(2-0-4)	I	I	I	I	R
SCID 508	Biomolecular and Spectroscopy Techniques	1(0-2-1)	R	R	I	I	R
SCID 510	Immunological Methods	1(0-2-1)	R	R	I	I	R
SCID 511	Gene Technology	1(0-2-1)	R	R	I	I	R
SCID 512	Receptor Binding and Enzyme Kinetic Assays	1(0-2-1)	R	R	I	I	R
SCID 514	Animal Experimentation in Biomedical Research	1(0-2-1)	R	R	I	I	R

Code	Name	Credits	PLOs				
			1	2	3	4	5
SCPS 668	Metabolic Responses to Exercise and Environmental Stress	1(1-0-2)	R	R	R	I	R
SCPS 676	Physiology of Aging	1(1-0-2)	R	R	R	I	R
SCPS 687	Health Risk Appraisal in Fitness Facility	2(2-0-4)	R	R	I	I	R
SCPS 692	Fundamental Biomedical Innovation	1(1-0-2)	R	R	I	I	R
SCPS 693	Technology Entrepreneurship	1(0-2-1)	R	R	I	I	R
SCPS 694	Development of Drugs and Nutraceutical Products	2(2-0-4)	R	R	I	I	R
SCPS 801	Health Risks and Exercise Management in the Elderly	2(2-0-4)	R	R	I	I	R
3) Dissertation							
SCPS 699	Dissertation	36(0-108-0)	M	M	M	M	M
SCPS 799	Dissertation	48(0-144-0)	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 2 Course work and research

Plan 2.1 For students with Master's Degree

Year of study	Knowledge, skills, and any other expected learning outcomes
1st	1. Demonstrate ethics, responsibility with teamwork, leadership and mentoring skills 2. Integrate knowledge in physiology and related fields for knowledge transfer/innovation and problem solving
2nd	1. Integrate knowledge in physiology and related fields for knowledge transfer/innovation and problem solving 2. Create research in physiology and related fields to produce international publications, patents and/or innovations
3rd	1 Create research in physiology and related fields to produce international publications, patents or innovations 2 Deliver specific and generalizable knowledge by using various means of communications

Plan 2.2 For students with Bachelor's Degree

Year of study	Knowledge, skills, and any other expected learning outcomes
1st	1. Demonstrate ethics, responsibility with teamwork and leadership skills 2. Integrate knowledge in physiology and related fields for knowledge transfer/innovation and problem solving
2nd	1. Integrate knowledge in physiology and related fields for knowledge transfer/innovation and problem solving 2. Create research in physiology and related fields to produce international publications, patents or innovations
3rd	1. Create research in physiology and related fields to produce international publications, patents or innovations
4th	1. Deliver specific and generalizable knowledge by using various means of communications

APPENDIX E

The revised of Program

Appendix E
(For only Revised Curriculum)
The Revision of Ph.D.'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 .....xx.....**

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).

5. **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

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. Sunhapas Soodvilai	Associate Professor Dr. Sunhapas Soodvilai
Associate Professor Dr. Tepmanas Bupha-Intr	Associate Professor Dr. Tepmanas Bupha-Intr
Associate Professor Dr. Vitoon Saengsirisuwan	Associate Professor Dr. Vitoon Saengsirisuwan
Associate Professor Dr. Ratchakrit Srikuea	Associate Professor Dr. Ratchakrit Srikuea
Assistant Professor Dr. Witchuda Saengsawang	Assistant Professor Dr. Witchuda Saengsawang
Assistant Professor Dr. Nattapon Panupinthu, MD	Assistant Professor Dr. Nattapon Panupinthu, MD.

Current Program	Revised Program
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 2 Coursework and research

Plan 2.1 For students with Master's Degree

Courses of the Current Program	Courses of the Revised Program	Remark
Required Courses (6 credits)	**Required Courses (6 credits)**	
SCPS 608 Physiology Seminar III 1(1-0-2) วทสร ๖๐๘ สัมมนาสรีรวิทยา ๓	SCPS 608 Physiology Seminar III 1(1-0-2) วทสร ๖๐๘ สัมมนาสรีรวิทยา ๓	Changed Description
SCPS 677 Physiology Seminar IV 1(1-0-2) วทสร ๖๗๗ สัมมนาสรีรวิทยา ๔	-	Cancelled
SCPS 678 Scientific Writing and Communication 1(0-3-0) วทสร ๖๗๘ การเขียนและการสื่อสารทางวิทยาศาสตร์	-	Cancelled
SCPS 679 Advanced Topics in Physiology 3(1-4-4) วทสร ๖๗๙ หัวข้อทางสรีรวิทยาขั้นสูง	SCPS 679 Advanced Topics in Physiology 3(3-0-6) วทสร ๖๗๙ หัวข้อทางสรีรวิทยาขั้นสูง	Update credit, Changed Description
	SCPS 695 Research Methodology, Management, Communication and Grantsmanship 2(2-0-4) วทสร ๖๙๕ วิทยาระเบียบวิธีวิจัย การจัดการ การสื่อสาร และการหาทุนวิจัย	New course
Elective Courses (4 credits)	**Elective Courses (6 credits)**	
SCID 502 Cell Science 2(2-0-4) วทคร ๕๐๒ วิทยาศาสตร์เรื่องเซลล์	SCID 502 Cell Science 2(2-0-4) วทคร ๕๐๒ วิทยาศาสตร์เรื่องเซลล์	Unchanged
SCID 506 Concepts of Molecular Bioscience 2(2-0-4) วทคร ๕๐๖ หลักการทางวิทยาศาสตร์ชีวภาพ ระดับโมเลกุล	SCID 506 Concepts of Molecular Bioscience 2(2-0-4) วทคร ๕๐๖ หลักการทางวิทยาศาสตร์ชีวภาพ ระดับโมเลกุล	Unchanged
SCID 507 Microscopic Technique 1(0-2-1) วทคร ๕๐๗ เทคนิคการใช้กล้องจุลทรรศน์	-	Cancelled
SCID 508 Biomolecular and 1(0-2-1)	SCID 508 Biomolecular and 1(0-2-1)	Unchanged

Courses of the Current Program	Courses of the Revised Program	Remark
Spectroscopy Techniques วทคร ๕๐๘ เทคนิคด้านชีวโมเลกุลด้านสเปกโทรสโกปี	Spectroscopy Techniques วทคร ๕๐๘ เทคนิคด้านชีวโมเลกุลด้านสเปกโทรสโกปี	
SCID 509 Separation Techniques 1(0-2-1) วทคร ๕๐๙ เทคนิคการแยกสาร	-	Cancelled
SCID 510 Immunological Methods 1(0-2-1) วทคร ๕๑๐ ระเบียบวิธีวิทยาภูมิคุ้มกัน	-	Cancelled
SCID 511 Gene Technology 1(0-2-1) วทคร ๕๑๑ เทคโนโลยีด้านยีน	SCID 511 Gene Technology 1(0-2-1) วทคร ๕๑๑ เทคโนโลยีด้านยีน	Unchanged
SCID 512 Receptor Binding and Enzyme Kinetic Assays 1(0-2-1) วทคร ๕๑๒ การสอบปริมาณการจับตัวรับและเอนไซม์เชิงจลน์	-	Cancelled
SCID 513 Animal Cell Culture Techniques 1(0-2-1) วทคร ๕๑๓ เทคนิคการเพาะเลี้ยงเซลล์สัตว์	-	Cancelled
SCID 514 Animal Experimentation in Biomedical Research 1(0-2-1) วทคร ๕๑๔ การใช้สัตว์ทดลองในงานวิจัยทางชีวการแพทย์	-	Cancelled
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	-	Cancelled
SCPS 606 Physiology Seminar 1 1(1-0-2) วทสร ๖๐๖ สัมมนาสรีรวิทยา ๑	-	Cancelled
SCPS 607 Physiology Seminar II 1(1-0-2) วทสร ๖๐๗ สัมมนาสรีรวิทยา ๒	-	Cancelled
SCPS 623 Neurophysiology 2(2-0-4) วทสร ๖๒๓ ประสาทสรีรวิทยา	-	Cancelled
SCPS 630 Scientific Paper Analysis 1(0-2-1) วทสร ๖๓๐ การวิเคราะห์บทความทางวิทยาศาสตร์	-	Cancelled
SCPS 639 Laboratory Methods in Physiology 1(0-3-1) วทสร ๖๓๙ วิธีปฏิบัติการทางสรีรวิทยา	-	Cancelled
SCPM 611 Advanced Pharmacology 3(3-0-6) วทภส ๖๑๑ เภสัชวิทยาขั้นสูง	-	Cancelled

Courses of the Current Program	Courses of the Revised Program	Remark
-	SCPS 668 Metabolic Responses to Exercise and Environmental Stress 1(1-0-2) วทสร ๖๖๘ การตอบสนองทางเมแทบอลิซึมต่อการออกกำลังกายและความเครียดจากสภาวะแวดล้อม	New course
-	SCPS 676 Physiology of Aging 1(1-0-2) วทสร ๖๗๖ สรีรวิทยาการชราภาพ	New course
-	SCPS 687 Health Risk Appraisal in Fitness Facility 2(2-0-4) วทสร ๖๘๗ การประเมินความเสี่ยงด้านสุขภาพในสถานที่ออกกำลังกาย	New course
-	SCPS 801 Health Risks and Exercise Management in the Elderly 2(2-0-4) วทสร ๘๐๑ ความเสี่ยงด้านสุขภาพและการจัดการการออกกำลังกายในผู้สูงอายุ	New course
Dissertation Plan 2.1 For students with Master's Degree SCPS 699 Dissertation 36(0-108-0) วทสร ๗๙๙ วิทยานิพนธ์	**Dissertation** Plan 2.1 For students with Master's Degree SCPS 699 Dissertation 36(0-108-0) วทสร ๗๙๙ วิทยานิพนธ์	Changed Description

Plan 2.2 For students with Bachelor's Degree

Courses of the Current Program	Courses of the Revised Program	Remark
Required Courses (20 credits) SCID 516 Biostatistics 3(3-0-6) วทคร ๕๑๖ ชีวสถิติ	**Core Courses (18 credits)** -	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 608 Physiology Seminar III 1(1-0-2) วทสร ๖๐๘ สัมมนาสรีรวิทยา ๓	SCPS 608 Physiology Seminar III 1(1-0-2) วทสร ๖๐๘ สัมมนาสรีรวิทยา ๓	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	Update credit, Changed code, Name, title and Description

Courses of the Current Program	Courses of the Revised Program	Remark
SCPS 639 Laboratory Methods in Physiology 1(0-3-1) วทสร ๖๓๙ วิธีปฏิบัติการทางสรีรวิทยา	-	Cancelled
SCPS 677 Physiology Seminar IV 1(1-0-2) วทสร ๖๗๗ สัมมนาสรีรวิทยา ๔	-	Cancelled
SCPS 678 Scientific Writing and Communication 1(0-3-0) วทสร ๖๗๘ การเขียนและการสื่อสารทางวิทยาศาสตร์	-	Cancelled
SCPS 679 Advanced Topics in Physiology 3(1-4-4) วทสร ๖๗๙ หัวข้อทางสรีรวิทยาขั้นสูง	SCPS 679 Advanced Topics in Physiology 3(3-0-6) วทสร ๖๗๙ หัวข้อทางสรีรวิทยาขั้นสูง	Update credit, Changed Description
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 691 Biostatistics for Physiology and Biomedical Research 2(2-0-4) วทสร ๖๙๑ ชีวสถิติสำหรับสรีรวิทยาและการวิจัยวิทยาศาสตร์การแพทย์	New couse
-	SCPS 695 Research Methodology, Management, communication and Grantsmanship 2(2-0-4) วทสร ๖๙๕ วิทยาระเบียบวิธีวิจัย การจัดการการสื่อสารและการหาทุนวิจัย	New course
Elective Courses (4 credits)	**Elective Courses (6 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	SCID 502 Cell Science 2(2-0-4) วทคร ๕๐๒ วิทยาศาสตร์เรื่องเซลล์	Unchanged
SCID 506 Concepts of Molecular Bioscience 2(2-0-4) วทคร ๕๐๖ หลักการทางวิทยาศาสตร์ชีวภาพระดับโมเลกุล	SCID 506 Concepts of Molecular Bioscience 2(2-0-4) วทคร ๕๐๖ หลักการทางวิทยาศาสตร์ชีวภาพระดับโมเลกุล	Unchanged
SCID 507 Microscopic Technique 1(0-2-1) วทคร ๕๐๗ เทคนิคการใช้กล้องจุลทรรศน์	-	Cancelled
SCID 508 Biomolecular and 1(0-2-1)	SCID 508 Biomolecular and 1(0-2-1)	Unchanged

Courses of the Current Program	Courses of the Revised Program	Remark
Spectroscopy Techniques วทคร ๕๐๘ เทคนิคด้านชีวโมเลกุลด้านสเปกโทรสโกปี	Spectroscopy Techniques วทคร ๕๐๘ เทคนิคด้านชีวโมเลกุลด้านสเปกโทรสโกปี	
SCID 509 Separation Techniques 1(0-2-1) วทคร ๕๐๙ เทคนิคการแยกสาร	-	Cancelled
SCID 510 Immunological Methods 1(0-2-1) วทคร ๕๑๐ ระเบียบวิธีวิทยาภูมิคุ้มกัน	SCID 510 Immunological Methods 1(0-2-1) วทคร ๕๑๐ ระเบียบวิธีวิทยาภูมิคุ้มกัน	Unchanged
SCID 511 Gene Technology 1(0-2-1) วทคร ๕๑๑ เทคโนโลยีด้านยีน	SCID 511 Gene Technology 1(0-2-1) วทคร ๕๑๑ เทคโนโลยีด้านยีน	Unchanged
SCID 512 Receptor Binding and 1(0-2-1) Enzyme Kinetic Assays วทคร ๕๑๒ การสอบปริมาณการจับตัวรับและเอนไซม์เชิงจลน์	SCID 512 Receptor Binding and 1(0-2-1) Enzyme Kinetic Assays วทคร ๕๑๒ การสอบปริมาณการจับตัวรับและเอนไซม์เชิงจลน์	Unchanged
SCID 513 Animal Cell Culture 1(0-2-1) Techniques วทคร ๕๑๓ เทคนิคการเพาะเลี้ยงเซลล์สัตว์	-	Cancelled
SCID 514 Animal Experimentation 1(0-2-1) in Biomedical Research วทคร ๕๑๔ การใช้สัตว์ทดลองในงานวิจัยทางชีวการแพทย์	SCID 514 Animal Experimentation 1(0-2-1) in Biomedical Research วทคร ๕๑๔ การใช้สัตว์ทดลองในงานวิจัยทางชีวการแพทย์	Unchanged
SCPM 611 Advanced Pharmacology 3(3-0-6) วทภส ๖๑๑ เภสัชวิทยาขั้นสูง	-	Cancelled
SCPS 623 Neurophysiology 2(2-0-4) วทสร ๖๒๓ ประสาทสรีรวิทยา	-	Cancelled
-	SCPS 668 Metabolic Responses to Exercise and Environmental Stress 1(1-0-2) วทสร ๖๖๘ การตอบสนองทางเมแทบอลิซึมต่อการออกกำลังกายและความเครียดจากสภาวะแวดล้อม	New course
-	SCPS 676 Physiology of Aging 1(1-0-2) วทสร ๖๗๖ สรีรวิทยาการชราภาพ	New course
-	SCPS 687 Health Risk Appraisal in Fitness Facility 2(2-0-4) วทสร ๖๘๗ การประเมินความเสี่ยงด้านสุขภาพในสถานที่ออกกำลังกาย	New course
-	SCPS 692 Fundamentals Biomedical Innovation 1(1-0-2)	New course

Courses of the Current Program	Courses of the Revised Program	Remark
	วทสร ๖๙๒ นวัตกรรมชีวการแพทย์พื้นฐาน	
-	SCPS 693 Technology Entrepreneurship 1(0-2-1) วทสร ๖๙๓ ผู้ประกอบการธุรกิจเทคโนโลยี	New course
-	SCPS 694 Development of Drugs and Nutraceutical Products 2(2-0-4) วทสร ๖๙๔ การพัฒนายาและโภชนเภสัชภัณฑ์	New course
-	SCPS 801 Health Risks and Exercise Management in the Elderly 2(2-0-4) วทสร ๘๐๑ ความเสี่ยงด้านสุขภาพและการจัดการการออกกำลังกายในผู้สูงอายุ	New course
Dissertation Plan 2.2 For students with Bachelor's Degree SCPS 799 Dissertation 48(0-144-0) วทสร ๗๙๙ วิทยานิพนธ์	**Dissertation** Plan 2.2 For students with Bachelor's Degree SCPS 799 Dissertation 48(0-144-0) วทสร ๗๙๙ 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)

Course Category	Credits		
	Criteria on Graduate Studies A.D. 2015	Curriculum Structure of the Current Program	Curriculum Structure of the Revised Program
Plan 2 Coursework and Research **Plan 2.1 For students with Master's Degree**			
1. Required courses 2. Elective courses 3. Dissertation	12 Credits 36 Credits	6 6 36	6 6 36
Total credits (not less than)	48	48	48
Plan 2.2 For students with Bachelors Degree			
1. Required courses 2. Elective courses 3. Dissertation	24 Credits 48 Credits	20 4 48	18 6 48
Total credits (not less than)	72	72	72

คำสั่ง คณะวิทยาศาสตร์ มหาวิทยาลัยมหิดล

ที่ ๑๔๘ / ๒๕๖๔

เรื่อง แต่งตั้งคณะกรรมการปรับปรุงหลักสูตรปรัชญาดุษฎีบัณฑิต
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 เป็นคณะกรรมการปรับปรุงหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาสรีรวิทยา (หลักสูตรนานาชาติ)

๑. รศ.ดร.อาทิตย์ ไชยร้องเดื่อ	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. ผศ.ดร.นพ.ณัฐพล ภาณุพินธุ	กรรมการ
๙. ผศ.ดร.รัชกฤต ศรีเกื้อ	กรรมการ
๑๐.ผศ.ดร.วิชชุดา แสงสว่าง	กรรมการ
๑๑.อ.ดร.ชลลวัลย์ แสงเจริญธรรม	กรรมการ
๑๒.อ.ดร.คณิต ภูไข่	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. ศึกษาข้อมูลพื้นฐานเกี่ยวกับการเปิดสอนหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาสรีรวิทยา (หลักสูตรนานาชาติ) หรือใกล้เคียงจากต่างสถาบันทั้งในประเทศและ/หรือต่างประเทศ

๔. ศึกษาทำความเข้าใจมาตรฐานผลการเรียนรู้ แต่ละด้านของระดับคุณวุฒิ ลักษณะของหลักสูตร และคุณลักษณะของบัณฑิตที่พึงประสงค์ของหลักสูตรปรัชญาดุษฎีบัณฑิต 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

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