



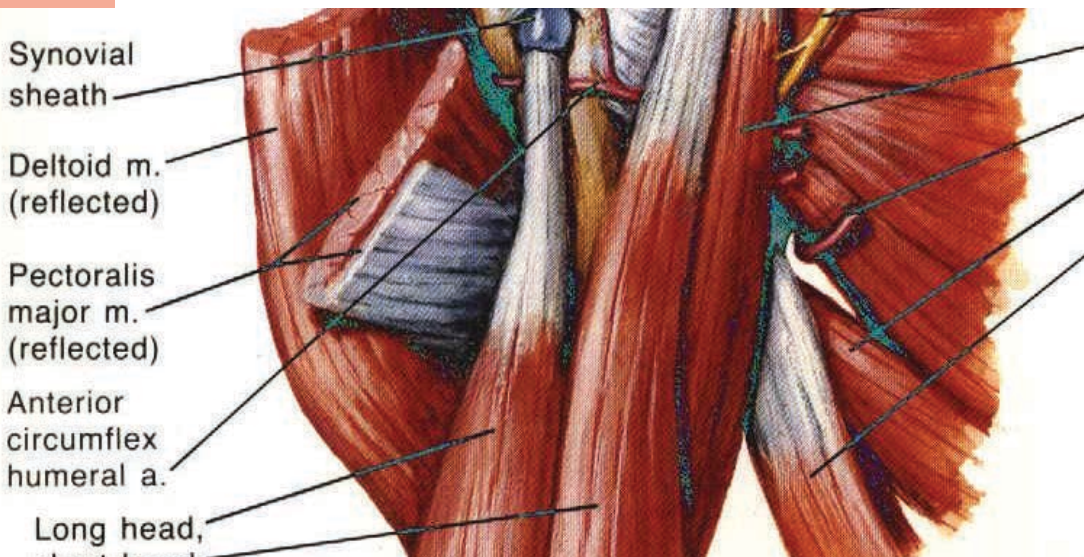
DOCTOR OF PHILOSOPHY PROGRAM IN PHYSIOLOGY

■ FACULTY OF MEDICAL SCIENCE

DOCTOR OF PHILOSOPHY PROGRAM IN PHYSIOLOGY

The Doctor of Philosophy Program in Physiology is dedicated to preparing graduates, capable in knowledge and research in applied physiology. In particular, our special focus is the application of physiology in Thai herbal research.

Our faculty members are outstanding and sought after to carry out commissioned research from related parties both in Thailand and abroad. Some scholarships are available to students.



Objectives

The program is rigorous research-oriented doctorate that prepares scholars to attain the following.

- In-depth knowledge and research skills, adequate to create new discoveries and innovations, especially in extending the Thai Local wisdom and/or the alternative medicine.
- Competencies in analysis and application of physiology.
- Skills in quantitative analysis, communication and ICT as indispensable tools of systematic scientific process.
- Professional ethics.

Admission

In accordance with the Graduate School Rules and Regulations. The program committee reserves the rights to require more qualifications as deemed appropriate.

Medium of Instruction

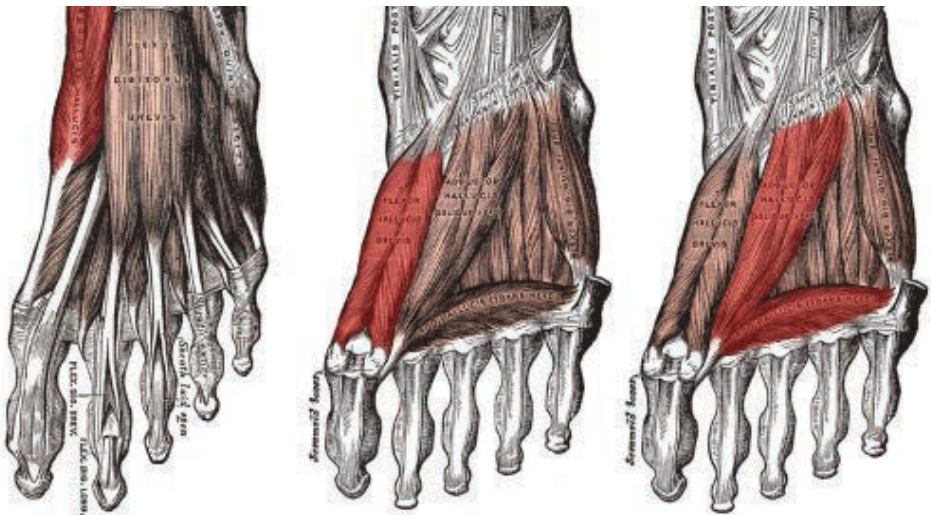
Thai and English

Research Focus

- Neurophysiology
- Electrophysiology
- Behavioral Neuroscience
- Cardiovascular Physiology
- Molecular Physiology
- Membrane Biology
- Membrane Biology of Ion Transport
- Exercise Physiology

Requirement for Graduation

In accordance with the Graduate School Rules and Regulations.



Doctor of Philosophy Program in Physiology

■ FACULTY OF MEDICAL SCIENCE

Structure of the Program

1. Credit Requirements. *

Requirements	Option 1.1	Option 1.2	Option 2.1	Option 2.2
Coursework	-	-	12	24
Core Courses	-	-	3	12
Electives	-	-	9	12
Required Non-credit Courses	4	7	4	7
Dissertation	48	72	36	48
Total	48	72	48	72

* Minimum credits required.

2. Core Courses

Requirements	Option 1.1		Option 1.2		Option 2.1		Option 2.2	
	Course No.	Cr.	Course No.	Cr.	Course No.	Cr.	Course No.	Cr.
System Physiology	-	-	-	-	-	-	421511	3
Physiology Research Techniques	-	-	-	-	-	-	421513	2
Cellular Physiology	-	-	-	-	-	-	421528	2
Use of Laboratory Animal and Animal Ethic	-	-	-	-	-	-	421533	2
Advanced Integrative Physiology	-	-	-	-	421611	2	421611	2
Scientific Paper Analysis	-	-	-	-	421612	1	421612	1
Total	0	0	0	0	2	3	6	12

3. Electives

Requirements	Option 1.1		Option 1.2		Option 2.1		Option 2.2	
	Course No.	Cr.	Course No.	Cr.	Course No.	Cr.	Course No.	Cr.
Advanced Respiratory Physiology	-	-	-	-	421621	3	421621	3
Advanced Renal Physiology	-	-	-	-	421622	3	421622	3
Advanced Gastrointestinal Physiology	-	-	-	-	421623	3	421623	3
Advanced Endocrine Physiology	-	-	-	-	421624	3	421624	3
Neuroscience	-	-	-	-	421625	3	421625	3
Advanced Cardiovascular Physiology	-	-	-	-	421626	3	421626	3
Physiology and Complementary and Alternative Medicine	-	-	-	-	421627	3	421627	3
Total	0	0	0	0	7	≥9	7	≥12

4. Required Non-credit Courses.

Requirements	Option 1.1		Option 1.2		Option 2.1		Option 2.2	
	Course No.	Cr.	Course No.	Cr.	Course No.	Cr.	Course No.	Cr.
Seminar 1	421696	1	421696	1	421696	1	421696	1
Seminar 2	421697	1	421697	1	421697	1	421697	1
Seminar 3	421698	1	421698	1	421698	1	421698	1
Seminar 4	421699	1	421699	1	421699	1	421699	1
Research Methodology in Health Science	-	-	422510	3	-	-	422510	3
Total	4	4	5	7	4	4	5	7

5. Dissertation Credit Requirements.

Requirements	Option 1.1		Option 1.2		Option 2.1		Option 2.2	
	Course No.	Cr.	Course No.	Cr.	Course No.	Cr.	Course No.	Cr.
Dissertation 1 Option 1.1	421651	8	-	-	-	-	-	-
Dissertation 2 Option 1.1	421652	8	-	-	-	-	-	-
Dissertation 3 Option 1.1	421653	8	-	-	-	-	-	-
Dissertation 4 Option 1.1	421654	8	-	-	-	-	-	-
Dissertation 5 Option 1.1	421655	8	-	-	-	-	-	-
Dissertation 6 Option 1.1	421656	8	-	-	-	-	-	-
Dissertation 1 Option 1.2	-	-	421661	9	-	-	-	-
Dissertation 2 Option 1.2	-	-	421662	9	-	-	-	-
Dissertation 3 Option 1.2	-	-	421663	9	-	-	-	-
Dissertation 4 Option 1.2	-	-	421664	9	-	-	-	-
Dissertation 5 Option 1.2	-	-	421665	9	-	-	-	-
Dissertation 6 Option 1.2	-	-	421666	9	-	-	-	-
Dissertation 7 Option 1.2	-	-	421667	9	-	-	-	-
Dissertation 8 Option 1.2	-	-	421668	9	-	-	-	-
Dissertation 1 Option 2.1	-	-	-	-	421671	9	-	-
Dissertation 2 Option 2.1	-	-	-	-	421672	9	-	-
Dissertation 3 Option 2.1	-	-	-	-	421673	9	-	-
Dissertation 4 Option 2.1	-	-	-	-	421674	9	-	-
Dissertation 1 Option 2.2	-	-	-	-	-	-	421681	8
Dissertation 2 Option 2.2	-	-	-	-	-	-	421682	8
Dissertation 3 Option 2.2	-	-	-	-	-	-	421683	8
Dissertation 4 Option 2.2	-	-	-	-	-	-	421684	8
Dissertation 5 Option 2.2	-	-	-	-	-	-	421685	8
Dissertation 6 Option 2.2	-	-	-	-	-	-	421686	8
Total	6	48	8	72	4	36	6	48

Course Descriptions

421511 System Physiology

3(3-0-6)

Concepts and principles of the roles of tissues and organs in the human body and its functions, sequential study of various systems including cellular, neural, muscular, cardiovascular, respiratory, gastrointestinal, renal, endocrine, and reproductive physiology as well as the investigation of the adaptation of these systems under various conditions.

421513 Physiology Research Techniques

2(0-6-3)

Comprehensive study of physiology research techniques and practices.

421528 Cellular Physiology

2(2-0-4)

An extensive inquiry of physicochemical properties of cells, cell membrane, ion channels, mechanisms of membrane transport, regulations of cellular functions, and techniques and methods for studying cell properties and functions.

421533 Use of Laboratory Animal and Animal Ethics

2(1-3-3)

Fundamental knowledge related to types, species, and biological information of laboratory animals; contribution and selection of laboratory animals in medical science research; standard care and basic essential techniques used with laboratory animals, such as sexing, handling and restraint, anesthesia, oral administration, injection, blood collection, and euthanasia; and ethics on laboratory animal care and use.

421611 Advanced Integrative Physiology

2(1-3-4)

Integrated knowledge of the human body's holistic functions in both normality and pathology, how to analyze and describe health problems related to physiology, identification of relevant research problems, and designing a study to solve the problems.

421612 Scientific Paper Analysis**1(0-3-4)**

Inquiry on how to examine and critically read scientific papers in order to identify the importance of research and research problems, analysis and criticism of research methodologies, methods on data presentation, interpretation, discussion, conclusion, and recommendations for future research including how to evaluate the quality and credibility of a scientific paper.

421621 Advanced Respiratory Physiology**3(2-3-4)**

Advanced knowledge on how the respiratory system works, responses of respiratory system in various conditions, pathophysiology of the respiratory system, research techniques used in the study of respiratory physiology, and how to identify research problems related to respiratory physiology.

421622 Advanced Renal Physiology**3(2-3-4)**

Advanced concepts and principles of the function mechanisms of the endocrine system, responses of the endocrine system in various conditions, pathophysiology of the endocrine system, research techniques in the study of endocrine physiology, and how to identify research problems related to endocrine physiology.

421623 Advanced Gastrointestinal Physiology**3(2-3-4)**

Advanced cognition of gastrointestinal functions and its regulations relevant to motility, secretion, digestion, and absorption of nutrients, water, and electrolytes; pathophysiology of gastrointestinal system including research techniques used in the study of gastrointestinal physiology and how to identify research problems related to gastrointestinal physiology.

421624 Advanced Endocrine Physiology**3(2-3-4)**

Overview of the function mechanisms of the endocrine system, responses of the endocrine system in various conditions, pathophysiology of the endocrine system, research techniques used in the study of endocrine physiology, and how to identify research problems related to endocrine physiology.

421625 Neuroscience**3(2-3-4)**

Comprehensive knowledge of the nervous system regarding neurophysiology and neurology, development of brains and spinal cords, molecular biology of nerve cells, connection between nerve cells and various functions of the nervous system including mechanisms of neurological diseases, standard techniques used in neuroscience, bioelectric potentials measurement, neurochemistry, neuropharmacology, and neurobehavior as well as how to identify research problems related to neuroscience.

421626 Advanced Cardiovascular Physiology**3(2-3-4)**

Extensive knowledge of the cardiovascular system, blood flow and its distribution, regulations of the cardiovascular system, techniques in cardiovascular research, and how to identify research problems related to cardiovascular physiology.

421627 Physiology and Complementary Alternative Medicine 3(2-3-4)

Definitions, classifications of complementary and alternative medicine (CAM), and application of physiology in CAM.

421651 Dissertation I, Option 1.1**8 Credits**

Identifying a research problem, writing a research proposal describing the significance and purposes of the study and research methodologies in brief including an extensive review of the literature.

421652 Dissertation II, Option 1.1**8 Credits**

Nomination of the dissertation supervisory committee to the Graduate School and submission of the dissertation title to advisors.

421653 Dissertation III, Option 1.1**8 Credits**

Conducting an extensive research, reporting progress of the research to the dissertation advisors, and completing the qualifying examination.

421654 Dissertation IV, Option 1.1**8 Credits**

Conducting an extensive research, reporting progress of the research to the dissertation advisors, and completing a dissertation proposal examination.

421655 Dissertation V, Option 1.1**8 Credits**

Conducting an extensive research, reporting progress of the research to the thesis advisors, and preparing a scientific manuscript for publication under a standard peer-review process.

421656 Dissertation VI, Option 1.1**8 Credits**

Summarizing all research data, passing the dissertation defense, compliance with dissertation corrections if any, and submission of the completed dissertation to the Graduate School.

421661 Dissertation I, Option 1.2**9 Credits**

Identifying a research problem writing a research proposal describing the significance and purposes of the study and research methodologies in brief including an extensive review of the literature.

421662 Dissertation II, Option 1.2**9 Credits**

Nomination of the dissertation supervisory committee to the Graduate School and submission of the dissertation title to advisors.

421663 Dissertation III, Option 1.2**9 Credits**

Conducting an extensive research and completing the qualifying examination.

421664 Dissertation IV, Option 1.2**9 Credits**

Conducting an extensive research, reporting progress of the research to the dissertation advisors, and completing a dissertation proposal defense.

421665 Dissertation V, Option 1.2**9 Credits**

Conducting an extensive research and reporting progress of the research to the dissertation advisors.

421666 Dissertation VI, Option 1.2**9 Credits**

Conducting an extensive research and reporting progress of the research to the dissertation advisors.

421667 Dissertation VII, Option 1.2**9 Credits**

Conducting an extensive research and preparing a scientific manuscript for publication under a standard peer-review process.

421668 Dissertation VIII, Option 1.2**9 Credits**

Summarizing all research data, completing the dissertation defense, compliance with dissertation corrections if any, and submission of the complete dissertation to the Graduate School.

421671 Dissertation I, Option 2.1**9 Credits**

Nomination of the dissertation supervisory committee to the Graduate School and submission of the dissertation title to the advisors.

421672 Dissertation II, Option 2.1**9 Credits**

Conducting an extensive research, reporting progress of the research to dissertation advisors, and completing the qualifying examination.

421673 Dissertation III, Option 2.1**9 Credits**

Conducting an extensive research, reporting progress of the research to dissertation advisors, completing a dissertation proposal examination, and preparing a scientific manuscript for publication under a standard peer-review process.

421674 Dissertation IV, Option 2.1**9 Credits**

Summarizing all research data, completing the dissertation defense, compliance with dissertation corrections if any, and submission of the completed dissertation to the Graduate School.

421681 Dissertation I, Option 2.2**8 Credits**

Identifying a research problem, writing a research proposal describing the significance and purposes of the study and research methodologies in brief including an extensive review of literature.

421682 Dissertation II, Option 2.2**8 Credits**

Nomination of the dissertation supervisory committee to the Graduate School and submission of the dissertation title to the advisors.

421683 Dissertation III, Option 2.2**8 Credits**

Conducting an extensive research and completing the qualifying examination.

421684 Dissertation IV, Option 2.2**8 Credits**

Conducting an extensive research, reporting progress of the research to dissertation advisors, and completing the thesis proposal examination.

421685 Dissertation V, Option 2.2**8 Credits**

Conducting an extensive research and preparing a scientific manuscript for publication under a standard peer-review process.

421686 Dissertation VI, Option 2.2**8 Credits**

Summarizing all research data, completing the dissertation defense, compliance with dissertation corrections if any, and submission of the completed dissertation to the Graduate School.

421696 Seminar I**1(0-2-1)**

Comprehensive seminar on how to search, read, and analyze research articles, oral presentation practice, and seminar among teaching staff and students on selected topics in physiology.

421697 Seminar II**1(0-2-1)**

Seminar on current trends and issues in physiology.

421698 Seminar III**1(0-2-1)**

Seminar on selected applied knowledge in physiology which is related to other medical sciences.

421699 Seminar IV**1(0-2-1)**

Seminar on selected topics in physiology which are related to writing the doctoral dissertation.

422510 Research Methodology in Health Sciences**3(3-0-6)**

Definitions, characteristics and goals of research, research methodologies, types of research, determination of research questions, variables and hypothesis, data collection, data analysis, research proposal and research report writing, research evaluation, research applications, ethics in research, and advanced research techniques in health sciences.

422513 Cell Biology**3(3-0-6)**

Introduction to cells, cell organization and functions, bio membranes, cellular amygdala, genetic information and mechanisms, protein synthesis, degradation, transportation, cytoskeleton, cell signaling, cell cycles and programmed cell death, cell communications, stem cells, and selected topics in cell biology.