

Doctor of Philosophy (Tropical Medicine)

Course Duration: 3-4 years (6-8 semesters)

Academic institution: Khon Kaen University

Campus: Khon Kaen Campus

Background and Rational:

To serve Thailand 4.0 policy, Khon Kaen University (KKU) is committed to academic excellence and international collaboration in order to promote knowledge and technology exchanges. KKU is located in geographical proximity to the Indo-China countries and thus is the academic institute truly connecting the Indo-China region's knowledge base. It is a leader in excellence in teaching, learning, research, and development including innovations that are linked to academic services, technology transfer, problem-solving, and development projects in the area, especially in the Northeastern region and in the Greater Mekong Sub-region by using the research study as a learning-base. Therefore, KKU was appointed as the National University of Research in 2010 with one of the missions to build up research and applications for the benefit of society.

Faculty of Medicine KKU aims to be a global hub for tropical medicine research. It is dedicated to providing outstanding educational curricula and programs to encourage students' self-evaluation, independent thinking, and investigation. A rich variety of courses in medical and health sciences offer students every opportunity to hone professional skills to effectively and efficiently serve patients. Internationally respected, highly competent lecturers, clinicians and researchers instruct students; focusing on student-centered, evidence-based, creative, problem-solving, and research.

Researchers from the Faculty of Medicine, Khon Kaen University, rank among the top of tropical disease researchers in Asia,' said Yukun Harsono, Senior Vice President of Product Management, Elsevier Inc., at the 4th QS University Rankings and Evaluation Workshop, held in Singapore (November 2010). The Faculty of Medicine, KKU is one of Asia's best destinations for tropical disease research. Indeed, the Faculty of Medicine, KKU has the largest number of fractional publications in Tropical Medicine and Parasitology among Asian Pacific countries.

The Tropical Medicine Graduate program was established in 2012. It is an inter-department program; staffs come from both preclinical and clinical departments in the faculty of Medicine, KKU, and provides basic to applied research. All staff that supervises project work on this program at KKU have a Ph.D. and/or MD. The program offers multidisciplinary studies from the molecular study of the pathogenesis of tropical diseases to tropical disease control program development. The coursework covers basic knowledge and current advanced

topics in tropical medicine. Student can choose their thesis topic based on their interest, such as laboratory studies, and community-based studies under the supervision of professors from different departments.

Doctor of Philosophy in Tropical Medicine International Program (Curriculum revised in 2022) aiming to produce doctorates with social responsibility. Specializing in tropical diseases with a deep understanding of molecular biology, pathogenesis, epidemiology and related statistics, tropical disease control, and research processes in tropical medicine. Be able to analyze and evaluate research and academic works in tropical medicine, including the integration of knowledge in tropical medicine and modern technology to design, develop, and conduct research to create new knowledge or innovation in tropical medicine according to research ethics. To solve the problem of tropical diseases of the community and society.

Program learning outcomes: PLOs

ELO1 Demonstrate advanced knowledge of tropical medicine and related fields

ELO2 Apply the molecular biology, epidemiology, biostatistics, and one-health for research/innovation in tropical medicine.

ELO3 Apply research methodology and experimental study to conduct research in the field of Tropical Medicine.

ELO4 Assess scientific works of peers in tropical and related fields.

ELO5 Demonstrate verbal communication skills in classroom lectures, seminar, and scientific conference.

ELO6 Demonstrate written communication skills for scientific proposal and manuscript preparation.

Study Plan

Plan 1.1	48	Credits
Plan 2.1	48	Credits
Plan 2.2	72	Credits

Plan 1.1

Core course (non-credit)	3	Credits
Dissertation	48	Credits
Total	48	Credits

Plan 2.1

Core courses	12	Credits
Compulsory courses (non-credit)	7	Credits
Elective (non-credit)	3	Credits
Dissertation	36	Credits
Total	48	Credits

Plan 2.2

Core courses	19	Credits
Elective	5	Credits
Dissertation	48	Credits
Total	72	Credits

Plan 1.1

Year 1 Semester 1		Credit
MD 597 997	Dissertation	9
	Registered credits	9
	Accumulative credits	9

Year 1 Semester 2		Credit
MD 597 991	Seminar in Advanced Tropical Medicine I	1 (non-credit)
MD 97 997	Dissertation	9
	Registered credits	9
	Accumulative credits	18

Year 2 Semester 1		Credit
M D597 992	Seminar in Advanced Tropical Medicine II	1 (non-credit)
MD 597 997	Dissertation	9
	Registered credits	9
	Accumulative credits	27

Year 2 Semester 2		Credit
MD 597 993	Seminar in Advanced Tropical Medicine III	1 (non-credit)
MD 597 997	Dissertation	9

	Registered credits	9
	Accumulative credits	36

Year 3 Semester 1		Credit
MD 597 997	Dissertation	9
	Registered credits	9
	Accumulative credits	45

Year 3 Semester 2		Credit
MD 597 997	Dissertation	3
	Registered credits	3
	Accumulative credits	48

Plan 2.1, 2.2

Year 1 Semester 1		Credit	
		Plan 2.1	Plan 2.2
*MD 597 701	Tropical Infectious diseases	2	2
*MD 597 702	Epidemiology of Tropical Infectious Diseases	2	2
*MD 597 703	Biostatistics for Tropical Disease Research	2	2
*MD 597 704	Laboratory Technique for Tropical Infectious Diseases	2 (non-credit)	2
xxx xxx	Elective Courses	3 (non-credit)	3
	Registered credits	11	11
	Accumulative credits	11	11

Year 1 Semester 2		Credit	
		Plan 2.1	Plan 2.1
*MD 597 705	Bioinformatics	2 (non-credit)	2
*MD 597 706	Research Methodology for Tropical Diseases	2	2
*MD 597 707	Tropical Disease Control	2 (non-credit)	2
*MD 597 708	Tropical Medicine Journal Club	1 (non-credit)	1

*MD 597 709	Scientific Writing	1	1
MD 597 991	Seminar in Advanced Tropical Medicine I	1	1
xxx xxx	Elective Courses	-	2
	Registered credits	9	11
	Accumulative credits	20	22

Year 2 Semester 1		Credit	
		Plan 2.1	Plan 2.1
MD 597 992	Seminar in Advanced Tropical Medicine II	1	1
MD 597 998	Dissertation	-	9
MD 597 999	Dissertation	9	-
	Registered credits	10	10
	Accumulative credits	30	32

Year 2 Semester 2		Credit	
		Plan 2.1	Plan 2.1
MD597 993	Seminar in Advanced Tropical Medicine III	1	1
MD597 998	Dissertation	-	9
MD597 999	Dissertation	9	-
	Registered credits	10	10
	Accumulative credits	40	42

Year 3 Semester 1		Credit	
		Plan 2.1	Plan 2.1
MD597 998	Dissertation	-	9
MD597 999	Dissertation	9	-
	Registered credits	9	9
	Accumulative credits	49	51

Year 3 Semester 2		Credit	
		Plan 2.1	Plan 2.1
MD597 998	Dissertation	-	9
MD597 999	Dissertation	9	-
	Registered credits	9	9
	Accumulative credits	58 (48)	60

Year 4 Semester 1		Credit	
		Plan 2.1	Plan 2.1
MD597 998	Dissertation	-	9
	Registered credits	-	9
	Accumulative credits	-	69
Year 4 Semester 2		Credit	
		Plan 2.1	Plan 2.1
MD597 998	Dissertation	-	3
	Registered credits	-	3
	Accumulative credits	-	72

Course Content

1.1 Core courses

MD 597 991	Seminar in Advanced Tropical Medicine I	1(1-0-2)
MD 597 992	Seminar in Advanced Tropical Medicine II	1(1-0-2)
MD 597 993	Seminar in Advanced Tropical Medicine III	1(1-0-2)

Dissertation

MD 597 997	Dissertation	48 credits
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2.1 Core courses 12 credits

MD 597 701	Tropical Infectious Diseases	2(2-0-4)
MD 597 702	Epidemiology of Tropical Infectious Diseases	2(2-0-4)
MD 597 703	Biostatistics for Tropical Disease Research	2(2-0-4)
MD 597 706	Research Methodology for Tropical Diseases	2(2-0-4)
MD 597 709	Scientific writing	1(1-0-2)
MD 597 991	Seminar in Advanced Tropical Medicine I	1(1-0-2)
MD 597 992	Seminar in Advanced Tropical Medicine II	1(1-0-2)
MD 597 993	Seminar in Advanced Tropical Medicine III	1(1-0-2)

Compulsory courses 7 credits (non-credit)

MD 597 704	Laboratory Technique for Tropical Infectious Diseases	2(0-6-2)
MD 597 705	Bioinformatics	2(2-0-4)
MD 597 707	Tropical Disease Control	2(2-0-4)
MD 597 708	Tropical Medicine Journal Club	1(1-0-2)

Elective courses 3 credits (non-credit)

Dissertation

MD 597 999	Dissertation	36 credits
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2.2 Core courses 19 credits

MD 597 701	Tropical Infectious Diseases	2(2-0-4)
MD 597 702	Epidemiology of Tropical Infectious Diseases	2(2-0-4)
MD 597 703	Biostatistics for Tropical Disease Research	2(2-0-4)
MD 597 706	Research Methodology for Tropical Diseases	2(2-0-4)
MD 597 704	Laboratory Technique for Tropical Infectious Diseases	2(0-6-2)
MD 597 705	Bioinformatics	2(2-0-4)
MD 597 707	Tropical Disease Control	2(2-0-4)
MD 597 709	Scientific writing	1(1-0-2)
MD 597 708	Tropical Medicine Journal Club	1(1-0-2)
MD 597 991	Seminar in Advanced Tropical Medicine I	1(1-0-2)
MD 597 992	Seminar in Advanced Tropical Medicine II	1(1-0-2)
MD 597 993	Seminar in Advanced Tropical Medicine III	1(1-0-2)

Elective courses 5 credits (non-credit)

Dissertation

MD 597 998	Dissertation	48 credits
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Elective courses

MD 567 712	Cells and Molecular Biology	3(3-0-6)
MD 567 714	Medical Science Research Methodology	3(2-3-6)
MD 597 709	Scientific writing	1(1-0-2)
MD 597 710	Selected topic in tropical medicine	1(1-0-2)
MD 627 706	Diagnostic Microbiology	1(1-0-2)
MD 627 707	Essential Immunology	1(1-0-2)
MD 627 708	Essential Skills for Biomedical Research	1(0-2-4)
MD 627 710	Bioinformatics and Big Data Analysis	2 (1-2-4)
MD 637 715	Biochemistry and Molecular Biology of Cancer	2(2-0-4)
MD 637 718	Advanced Techniques in Medical Biochemistry and Molecular Biology	2(0-6-3)
MD 647 701	Medical Parasitology	4(3-3-8)
MD 647 702	Advanced Parasitology	3(3-0-6)
MD 647 704	Molecular Techniques in Parasitology	2(0-6-3)
MD 647 705	Special Topics in Parasitology	2(2-0-4)
MD 647 706	Immunology of Parasitic Infections	2(2-0-4)
MD 647 707	Medical Malacology	2(1-3-4)
MD 647 708	Medical Entomology	2(1-3-4)
MD 797 794	Clinical Tropical Infectious Diseases	2(1-3-4)
MD 817 703	Health Systems Management	3(3-0-6)

Course descriptions**MD 567 712 Cells and Molecular Biology 3(3-0-6)**

Biomolecules and molecular organization within cell, cellular energy and metabolisms, genome structure and gene regulation, molecular structures of the cell and their functions, cell cycle, growth and differentiation, cellular interactions and communication, the immune system, molecular and cellular basis of diseases, cancer biology, maintenance of life and control mechanisms.

MD 567 714 Medical Science Research Methodology 3(2-3-6)

Principles, research design and methodology in medical science, practical and appropriate biostatistical analysis in medical sciences, including various presentations of research outcome, moral of researcher, human ethics and animal ethics

***MD 597 701 Tropical Infectious Diseases 2(2-0-4)**

Causation, molecular biology, pathogenesis, clinical features, diagnosis and management of the major parasitic, bacterial and viral diseases of tropical and developing countries, particularly those endemic in Asia.

***MD 597 702 Epidemiology of Tropical Infectious Diseases 2(2-0-4)**

Concepts of epidemiology, epidemiologic triad, prevention, descriptive epidemiology, principles of disease control, epidemiological surveillance, epidemiological investigation, epidemiology of communicable disease.

***MD 597 703 Biostatistics for Tropical Disease Research 2(2-0-4)**

Concept of biostatistics, data analysis and study design, probability and sampling distributions, confidence intervals, hypothesis testing, regression analysis, confounding and interactions. Case study and examples of epidemiology and biostatistics to study and control of tropical diseases.

***MD 597 704 Laboratory Technique for Tropical Infectious Diseases 2(0-6-2)**

Basic and advanced laboratory practices for Tropical Infectious Diseases research. Focus on basic molecular biology techniques, parasitological techniques, and microbiology techniques. Advanced and cutting-edge technologies will also be trained.

***MD 597 705 Bioinformatics 2(2-0-4)**

Concept and methods in bioinformatics. Focus on common applications for genomics, transcriptomics, and proteomics analysis.

***MD 597 706 Research Methodology for Tropical Diseases 2(2-0-4)**

Research ethics, research design in medical science, literature review, problem, hypothesis and objective formation, research proposal preparation, data collection, data analysis, discussion, and manuscript preparation

***MD 597 707 Tropical disease control 2(2-0-4)**

Concepts of disease prevention and control with special reference to Southeast Asia and developing countries, health determinants, assessment of community needs, provision of basic preventive services, and environment and health. Application of holistic/integrative and multidisciplinary approaches combining molecular

biology, microbiology, parasitology, epidemiology and geographic information systems to study and control of tropical diseases. Realities and challenges, case scenarios and examples of the prevention and control of tropical diseases, and the promotion of health in developing, remote and resource poor countries.

***MD 597 708 Tropical Medicine Journal club 1(1-0-2)**

Discuss published articles with new knowledge to promoting the awareness of current research findings. Critique and appraise research by utilizing research in evidence based practice of the speciality

***MD 597 709 Scientific writing 1(1-0-2)**

The fundamentals of effective scientific writing, focus primarily on the process of writing and publishing in various media including scientific manuscript writing for national and international journals and grant writing.

***MD 597 710 Selected topic in tropical medicine 1(1-0-2)**

Selected topic of interests related to tropical medicine including recent knowledge and technologies

MD 597 891 Seminar in Tropical Medicine I 1(1-0-2)

Selecting topics, literature search and review, reading scientific reports with critical appraisal, presentation and participation in discussion on research progress in tropical medicine and medical science

MD 597 892 Seminar in Tropical Medicine II 1(1-0-2)

Presentation and participation in discussion on advanced research project in tropical medicine and biomedical science and report on the progress of research thesis

MD 597 899 Thesis 12(0-0-0)

Conducting research in tropical medicine, report writing and presentation of thesis and writing manuscript for publication in national or international journal under the supervision of advisory committee

***MD 627 704 Medical Microbiology 2(2-0-4)**

Taxonomy of bacteria fungi and virus, pathogenesis of microorganisms, common infectious diseases, antimicrobial agents and resistance, immune response to microorganism infection, immune evasion of microorganisms, concept of epidemiology, outbreak investigation and genotyping, biosafety, law and regulation for microbiologist, concept in human and animal ethics, and cases studies

***MD 627 706 Diagnostic Microbiology 1(1-0-2)**

Microbial storage and specimens collection, principle of laboratory diagnosis for bacterial infection and specimen collection, Gram's stain, special stain, direct examination, culture and identification, drug susceptibility testing, molecular testing for bacterial diseases, principle of laboratory diagnosis for viral infection and specimen collection, techniques for viral isolation, molecular testing for viral diseases, principle of laboratory diagnosis for fungal infection and specimen collection, culture and identification, drug susceptibility, molecular testing for fungal diseases

***MD 627 707 Essential Immunology 1(1-0-2)**

Principle, concept and introduction to immunity, innate immunity, adaptive immunity, abnormal immunity, hypersensitivity, autoimmune diseases, immunodeficiency, tumourgenesis and tumour immunology, immunization, immunotherapy

***MD 627 708 Essential Skills for Biomedical Research 1(0-2-4)**

Data retrieving from various academic database, citation and literature searching, writing proposal, title, objectives, scope and planning of dissertation, oral and poster presentation for scientific works, writing manuscript for publication, tools and programs for data analysis, figure and media presentation, and preparation for dissertation and research, writing of progress report and presentation of research

***MD 627 710 Bioinformatics and Big Data Analysis 2 (1-2-4)**

Data retrieval from public database, structural and functional analysis, primer design, big data analysis and management, result visualization, R-programming for data analysis, phylogenetic analysis, whole genome analysis, RNA sequencing analysis, Proteomic analysis

MD 637 715 Biochemistry and Molecular Biology of Cancer 2(2-0-4)

Integrative cellular circumstances, the six hallmarks of cancer, strategy for cancer risk assessment, carcinogenesis, multistep process theory including microenvironment, host-environment interaction, inflammation and cancer, chromosome aberration, cancer stem cell and advance cancer research including recent technology

MD 637 718 Advanced Techniques in Medical Biochemistry and Molecular

Biology 2(0-6-3)

Advanced laboratory skills in medical biochemistry and molecular biology, advanced techniques for analyzing biomolecules, experimental design of animal models, high-throughput gene expression analysis, functional analysis of genes by knockout and knockdown methods, gene overexpression, gene editing, DNA technology, DNA cloning, DNA sequencing genome scan, determination of types of biomolecules by NMR spectroscopy

MD 647 701 Medical Parasitology 4(3-3-8)

Geographical distribution, morphology, biology, life cycle, transmission, pathogenesis, pathology and symptom, diagnosis, treatment, prevention and control, immunology and epidemiology of parasitic infection, arthropod of medical importance

MD 647 702 Advanced Parasitology 3(3-0-6)

Ultrastructure of parasite, taxonomy, parasite ecology, molecular systematics, population genetics, parasite immunopathology, molecular biology, parasite-associated cancer, antiparasitic drug, emerging parasite, current research in parasitology

MD 647 704 Molecular Techniques in Parasitology 2(0-6-3)

Practice in molecular biological techniques common used in parasitology research including DNA, RNA and protein extraction, purification, analysis, amplification, DNA sequencing, phylogenetic analysis, gene and protein profiles and immunohistostaining

MD 647 705 Special Topics in Parasitology 2(2-0-4)

A systematic literature review, searching, reading, analysis and interpretation of research information in parasitology and related biological sciences with critical appraisal, discussion with the advisor(s), presentation of the selected topics by oral presentation and report submission

MD 647 706 Immunology of Parasitic Infections 2(2-0-4)

Roles of molecular and cellular immune responses against parasitic infection, basic mechanism, functions of the effector cells and molecules in

inflammation, repairing process, and apoptosis, mucosal and tissue immunology, immunopathology, and methods for determination and interpretation

MD 647 707 Medical Malacology 2(1-3-4)

Taxonomy, morphology, physiology, ecology, molecular biology, field survey, host-parasite relationship and methods for cultivation of medically important snails

MD 647 708 Medical Entomology 2(1-3-4)

Taxonomy, morphology, biology, ecology and control of arthropod vectors particularly mosquitoes and flies, laboratory practice for identification of various stages of medically important arthropods, collection and preservation of parasite specimens and examination for infectious agents in these arthropods

MD 797 794 Clinical Tropical Infectious Diseases 2(1-3-4)

Common and public health problems of infectious diseases in tropics such as tuberculosis, dengue, melioidosis, leptospirosis, scrub typhus, helminthes, endemic fungi, AIDS, nontuberculous mycobacterium infection, etc. The topics emphasize on epidemiology, causative pathogen, clinical presentation, diagnosis, treatment, prevention, and case demonstration

MD 817 703 Health Systems Management 3 (3-0-6)

Scope of health systems, health systems strategies, factors affecting health care systems, national health systems, health needs assessment, health care development planning, health resources management, national health policies, rules and regulation needed for management, health insurance systems, health care financing, primary care unit, secondary and tertiary care services, competitive organization, evaluation of efficiency and effectiveness in health systems, health management systems innovation, sustainable health systems management.

MD817 765 Community Epidemiology 3(3-0-6)

Information systems, various community data based including secondary data, registration and record, surveillance systems and data quality assessment, design for additional data, primary data analysis, community epidemiology analytical framework, merging data sources, area based approach, multisites approach, translating research to policies, and policies evaluation

Graduation Conditions:

- GPA \geq 3.00 of 4.00
- Pass Qualifying Examination
- Pass Thesis Defense
- Publication

Thesis work or part of thesis work has been published in international journals

Applicant Qualifications

Plan 1.1 Graduated Master's degree in Tropical Medicine from the Faculty of Medicine, Khon Kaen University with a GPA above 3.5 no longer than 5 years.

Plan 2.1 Graduated Master's degree in Medical Science, Biological Science, or other related fields with a GPA above 3.25

Plan 2.2 Graduated with a Bachelor's degree in Medical Science, Biological Science, or other related fields with a GPA above 3.25 or ranked at 10% of the class.

Document Required

1. Fill the application form at <https://interadmission.gs.kku.ac.th/app/#/auth>

2. Passport Photo

3. Transcript with the degree certificate:

- Submit both transcript and degree certification
- In case the original is not in English, submit both original and translated version
- Doctoral candidates are to submit both master's and bachelor's
- Additional degree certificate can be submitted

4. Letters of Recommendation:

- Two letters of recommendation with the referee's signature and contact

5. English Proficiency Test Result: If any for master's candidates /A must for doctoral candidates

- The accepted results are: TOEFL (Paper based), TOEFL (Computer based), TOEFL (Internet based), TOEFL (ITP), IELTS (Academic Module), TU-GET (1000 total), CU-TEP and KCU-AELT (Provided by KCU), Any equivalent test or other test results excluded from the list will not be accepted. The result is to be active during the admission process. (Within 2 years after the test date).

		Passed score
TOEFL	(Paper Based)	500
TOEFL	(Computer Based)	173
TOEFL	(Internet Based)	61
TOEFL	(Institutional Testing Program)	500
IELTS	(Academic Based)	5.5
TU-GET	(1000)	550
CU-TEP	(120)	70

6. Passport

7. Additional documents: e.g. a concept paper, training course, curriculum vitae (Resume)

8. Application Fee: 40 USD per subject area (Cash only)

Tuition fee and living cost at KKU

Items	THB/per year	Remarks
Tuition fee (30,000/semester)	60,000	Fix
International student fee (15,000/semester)	30,000	Fix
Health insurance (15,000/year)	15,000	Standard
Accommodation (5,000/mo)	60,000	Standard
Living expense (15,000/mo)	180,000	Standard
Total	295,000	

Contact:

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