

## **Course Detail**

### **Master of Science in Program Parasitology**

**Course Title:** Master of Science Program in Parasitology (International Program)

**Master Degree:** Master of Science (Parasitology)

**Academic Institution:** Faculty of Medicine, Khon Kaen University

**Duration:** 2 years (4 semesters) (July 2022 – July 2024)

#### **Background and Rational:**

The MSc in Parasitology is an international program in Medical Parasitology. The program offers students the chance to expand their professional opportunities. The program provides core training in the theoretical and practical aspects of medical parasitology, and research opportunities in both basic and advanced in Parasitology and in related field such as in tropical diseases, public health, medical science and translational medicine, covering the protozoan and metazoan parasites of humans and the vectors which transmit them. Entry requires a Bachelor Degree in Science (B.Sc.) or related degree.

The program generally takes 2 years, one year for course work and another for the research project. Students will gain specialized skills to enable them to pursue a career in research, control or teaching related to medical parasitology, product managers and product specialists in private companies and the government sector.

#### **Co-operating Faculty:**

1. Faculty of Medicine, Mahasarakrm university
2. Faculty of Allied Health Sciences, Thammasat University
3. Faculty of Tropical Medicine, Mahidol University
4. Faculty of Science, Silpakorn University
5. Genome Institute 113, Thailand Science Park
6. Faculty of Veterinary Medicine, Mahasarakrm university
7. Faculty of Science, Mahidol University
8. Faculty of Science, Udon Thani Rajabhat University
9. Faculty of Natural Resources, Rajamangala University of Technology Isan, Sakon Nakhon Campus

#### **Co-operating Institutes:**

1. George Washington University, USA
2. Gifu University, Japan
3. Karlsruhe Institute of Technology, Germany
4. MIE University, Japan

5. National Institute of Infectious Diseases
6. Chungbuk National University, Republic of Korea

**Objectives:**

The program is intended to produce master degree graduates of international standard in Parasitology. Graduates will gain knowledge in the field and are proficient in researches. The mission of study programs is to improve health by focusing on the major parasitic diseases in the Greater Mekong Subregion and Southeast Asia countries.

**Course Synopsis and Methodology:**

**1. Study plan (Study in Thai only)**

Students are required to either choose plan A1 (research plan) or A2 (research and coursework plan).

- **Plan A1** is research only option. Student who enrolls in this program have to complete a thesis which is equivalent to 36 credits. Enrolment in Plan A1 requires a Bachelor Degree in Science (B.Sc.) or equivalent or have research experience at least 3 years. Applicants must also have a record of publication in international journals as first author or corresponding author of at least one paper.
  - Course requirement
 

▪ Coursework	2 credits (non-credit)
▪ Thesis	36 credits
▪ Total	36 credits
- **Plan A2** is a coursework and thesis option. Student must take subjects worth at least 19 credits. The thesis component is worth 17 credits. Enrolment in plan A2 requires a Bachelor Degree in Science (B.Sc.) or related subjects with a GPA of at least 2.5 or 65% or have research experience at least 2 years.
  - Course requirement
 

▪ Coursework (compulsory)	11 credits
▪ Coursework (elective)	8 credits
▪ Thesis	17 credits
▪ Total	36 credits

**2. Course Content/Study Topic**

**Course (2 non-credits)**

MD648 891 Seminar Parasitology I	1 (1-0-2) non-credit
MD648 892 Seminar Parasitology II	1 (1-0-2) non-credit

**Thesis 36 credits**

MD648 898 Thesis	36 credits
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## COURSEWORK FOR TYPE A2

### Course (compulsory) 11 credits

MD567 713	Laboratory Techniques in Medical Sciences	2(0-6-3)
MD567 714	Medical Science Research Methodology	3(2-3-6)
MD647 701	Medical Parasitology	4(3-3-8)
MD648 891	Seminar in Parasitology I	1(1-0-2)
MD648 892	Seminar in Parasitology II	1(1-0-2)

### Course (elective), a minimum of 8 credits

MD567 712	Cells and Molecular Biology	3(3-0-6)
MD647 703	Experimental Parasitology	3(1-6-5)
MD647 702	Advanced Parasitology	3(3-0-6)
MD647 708	Medical Entomology	2(1-3-4)
MD647 707	Medical Malacology	2(1-3-4)
MD647 706	Immunology of Parasitic Infections	2(2-0-4)
MD647 705	Special Topics in Parasitology	2(2-0-4)
MD647 704	Molecular Technique in Parasitology	2(0-6-3)

### Thesis 17 credits

MD648 899	Thesis	17 credits
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## STUDY PLAN

### PLAN A1

YEAR 1 SEMESTER 1		credits
MD648 898	Thesis	9
	<b>Total credits enrolled</b>	9
	<b>Total cumulative credits</b>	9

YEAR 1 SEMESTER 2		credits
MD648 891	Seminar Parasitology 1	1 non-credit
MD648 898	Thesis	9
	<b>Total credits enrolled</b>	9
	<b>Total cumulative credits</b>	18

YEAR 2 SEMESTER 1		credits
MD648 892	Seminar Parasitology 2	1 non-credit
MD648 898	Thesis	9
	<b>Total credits enrolled</b>	9
	<b>Total cumulative credits</b>	27

<b>YEAR 2 SEMESTER 2</b>		<b>Credits</b>
MD648 898	Thesis	9
<b>Total credits enrolled</b>		9
<b>Total cumulative credits</b>		36

**PLAN A2**

<b>YEAR 1 SEMESTER 1</b>		<b>credits</b>
MD567 713	Laboratory Techniques in Medical Sciences	2(0-6-3)
MD647 701	Medical Parasitology	4(3-3-8)
MDxxx xxx	Elective course	3
<b>Total credits enrolled</b>		9
<b>Total cumulative credits</b>		9

<b>YEAR 1 SEMESTER 2</b>		<b>credits</b>
MD648 891	Seminar in Parasitology I	1(1-0-2)
MD567 714	Medical Science Research Methodology	3(2-3-6)
MDxxx xxx	Elective course	5
MD648 899	Thesis	3
<b>Total credits enrolled</b>		12
<b>Total cumulative credits</b>		21

<b>YEAR 2 SEMESTER 1</b>		<b>credits</b>
MD648 892	Seminar in Parasitology II	1(1-0-2)
MD648 899	Thesis	9
<b>Total credits enrolled</b>		10
<b>Total cumulative credits</b>		31

<b>YEAR 2 SEMESTER 2</b>		<b>Credits</b>
MD648 899	Thesis	9
<b>Total credits enrolled</b>		5
<b>Total cumulative credits</b>		36

**DESCRIPTION OF COURSES**

**MD567 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

- MD567 713 Laboratory Techniques in Medical Sciences 2(0-6-3)**  
Principles and laboratory techniques in medical sciences, basic techniques in biochemistry, molecular biology, microbiology, immunology, parasitology, pathology, anatomy, physiology, neurosciences and pharmacology including laboratory animal handling
- MD567 714 Medical Science Research Methodology 3(2-3-6)**  
Principles, research design and methodology in medical sciences, practical and appropriate biostatistical analysis in medical sciences, including various presentations of research outcome, moral of researcher, human ethics and animal ethics
- MD647 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
- MD647 702 Advanced Parasitology 3(3-0-6)**  
Ultrastructure of parasite, taxonomy, parasite ecology, molecular systematics, population genetics, immunopathology, molecular biology, parasite-associated cancer, antiparasitic drug, emerging parasite, current research in parasitology
- MD647 703 Experimental Parasitology 3(1-6-5)**  
Good laboratory practice, photography of parasite, *In vitro* and *in vivo* cultivation of parasites, special techniques for parasitological specimens for identification, serodiagnosis, electron microscopy, genetic markers, drawing of parasite, conducting experimental research project
- MD647 708 Medical Entomology 2(1-3-4)**  
Taxonomy, morphology, biology, ecology and control of arthropod vectors, 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
- MD647 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
- MD647 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
- MD647 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
- MD647 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

**MD648 891 Seminar in Parasitology I****1(1-0-2)**

Searching, topic selection of the scientific articles, systematic review, reading, presentation and discussions on research works in parasitology and related subjects; skills in self-directed learning, presentation, leadership training, using information technology and moral of researcher

**MD648 892 Seminar in Parasitology II****1(1-0-2)**

Searching, topic selection of the scientific articles, systematic review, reading, presentation and discussions on research works in parasitology and related subjects; skills in self-directed learning, presentation, leadership training, using information technology and moral of researcher

**MD648 898 Thesis****36 credit**

Conducting research on a special topic for development of new knowledge in parasitology and related subjects, training for skills in scientific thinking, reasoning, planning of advanced research study, problem solving and using information technology to be capable in conducting research, skills in self-directed learning, leadership training, human ethics and animal ethics and writing manuscript for publication in national or international journal under the supervision of thesis advisory committee

**MD648 899 Thesis****17 credit**

Conducting research in parasitology, training for skills in scientific thinking, reasoning, planning of advanced research study, problem solving and using information technology to be capable in conducting research, skills in self-directed learning, leadership training, human ethics and animal ethics and report writing and presentation of thesis for publication in national or international journal under the supervision of thesis advisory committee

**Applicants Qualifications:****Entry Pre-requisites**

Qualification (Bachelor's Degree): Bachelor degree of Medicine Medical Science, Biological Science or other related fields Grade/GPA score: Plan A1, GPA above 3.0 or have research experience at least 3 years with at least 1 publication in peer-reviewed international journal. Plan A2, GPA above 2.5 or have research experience at least 2 years.

**Document Required:****Required documents are:**

1. Copy of academic transcript
2. Copy of degree certificate in English
3. Recent photo
4. Supporting documents
  - Letter of Recommendation
  - English Test Result (Applicants from a country where English is not the first language must enclose a TOEFL or IELTS test result. In all cases, the result must not be more than two years.

		<b>Passed score</b>
<b>TOEFL</b>	(Paper Based)	470
<b>TOEFL</b>	(Computer Based)	150
<b>TOEFL</b>	(Internet Based)	52
<b>TOEFL</b>	(Institutional Testing Program)	470
<b>IELTS</b>	(Academic Based)	5.0
<b>TU-GET</b>	(1000)	500
<b>CU-TEP</b>	(120)	60

- Research proposal
- 5. Copy of passport (if available)

**Contacts:**

Department of Parasitology, Faculty of Medicine, Khon Kaen University, 123  
Mittaparb Rd., Amphur Muang, Khon Kaen 40002 THAILAND.

Tel : +66 43 348387

E-mail : [porlau@kku.ac.th](mailto:porlau@kku.ac.th)

[mdpre04@kku.ac.th](mailto:mdpre04@kku.ac.th)

Website : <http://www.parasite.md.kku.ac.th/>

Facebook : department of parasitology, kku

**For more information:**

Human Resources Development Cooperation Division  
Thailand International Cooperation Agency (TICA)  
Government Complex, Building B (South Zone), 8th Floor,  
Chaengwattana Rd. Laksi District, Bangkok 10210 THAILAND  
Tel. +66 (2) 203 5000 ext. 43305, 43306 Fax: +66 (2) 143 8451  
E-mail: [tipp@mfa.mail.go.th](mailto:tipp@mfa.mail.go.th)

\*\*\*The application procedure will complete when TICA has received the hard copy of the application form and other related documents through the Royal Thai Embassy/Permanent Mission of Thailand to the United Nations/Royal Thai Consulate – General accredited to eligible countries/territories.