Course Detail

Master of Science Program in Parasitology (International Program)

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

2. Master Degree: Master of Science (Parasitology)

3. Academic Institution: Faculty of Medicine, Chiang Mai University

4. Duration: 2 years (June 2025-March 2027)

5. Background and Rational:

5.1 Connection with National Human Resource Development Policies and Strategies

5.1.1 Responding to the Six National Policies and Strategies

- Enhancing Competitiveness

The curriculum is designed to foster graduates who can create innovations and apply new knowledge to solve medical or other significant problems. Graduates will have the skills to seek knowledge, keep up with advancements in knowledge and technology, and develop problem-solving abilities for increasingly complex future challenges.

- Human Resource Development and Capacity Building

The program aims to produce graduates who possess knowledge and research skills to develop new knowledge and apply it to solve comprehensive problems. The research outcomes of graduates are expected to contribute to the betterment of humanity. Additionally, the program focuses on producing graduates with integrity and ethics in academic conduct, who are responsible to society, and who can properly manage laboratory safety standards.

- Creating Opportunities and Social Equity

This curriculum emphasizes creating opportunities and social equity through education that is accessible to everyone, regardless of gender, religion, social status, or economic background. The program focuses on equipping students with essential skills for real-life application and employment, ensuring that graduates can access work opportunities and contribute to social equality.

5.1.2 Responding to Sustainable Development Goals (SDGs)

SDGs no. 3: Ensure healthy lives and promote well-being for all ages

The program's educational outcome in relation to key skills (Program Learning Outcome, PLO2) is that graduates are able to effectively disseminate new knowledge in parasitology to the public. This contributes to ensuring the well-being of people in society.

SDGs no. 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

The program is primarily focused on predetermined educational outcomes, applying the principle of Constructive Alignment in curriculum design. This ensures that all students can achieve the learning outcomes equally. Additionally, one of the learning outcomes is that graduates can independently or collaboratively seek knowledge, making them lifelong learners. The program also allows applicants from all countries to enroll.

SDGs no. 9: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation

The program's key knowledge outcome (PLO1) is that graduates must apply essential techniques in parasitology and other related fields to create new knowledge or research. Graduates will thus be capable of producing new knowledge, contributing to societal progress and benefit.

SDGs no. 10: Reduce inequality within and among countries

The program allows students of all nationalities to apply, fostering collaboration among students during their studies (PLO3). This encourages an appreciation of social diversity in terms of ethnicity, culture, and perspectives, leading to a greater understanding of societal differences.

5.1.3 Responding to the Mission and Strategy of the University

CMU Strategy, no. 2: Creating sustainable development in medical innovations, health, and elderly care

The learning outcomes of the program (PLO1): graduates must create new knowledge through research to apply in solving comprehensive problems. Furthermore, these graduates may produce additional work that leads to the development of medical innovations and other fields in the future.

CMU Strategy, no. 4: Creating sustainable development in education management

To ensure the quality of education, the curriculum has been effectively developed as an outcome-based curriculum. It has been improved in terms of learning activities, assessment methods, and student counseling to foster development. Additionally, a follow-up plan has been established to use the results of the curriculum's implementation for continuous improvement. This is aimed at achieving sustainable development in educational management, aligning with societal needs.

CMU Strategy, no. 5: Creating sustainable development in research and innovation The learning outcomes of the program (PLO1): graduates must create new knowledge through research, as well as be able to seek knowledge independently and work as part of a team. The aim is for graduates to be capable of developing research and innovations in the future.

5.2 The importance of the subject and the reasons for the necessity of having a curriculum

The Master of Science program in Parasitology was first introduced around 1979 with the objective of producing graduates with knowledge and expertise in medical parasitology. The program aimed to develop research skills for the creation of new knowledge, instill ethical values, social responsibility, and the ability to effectively communicate and transfer knowledge. The program particularly focused on producing graduates to serve as university lecturers, as there was a shortage of qualified professionals at the time. The first cohort of students was admitted in 1979, and since then, the program has continuously produced graduates while updating the curriculum to remain relevant to the changing contexts over time. To date, more than 50 graduates have completed this program, and they have gone on to work as university lecturers, researchers, and experts in various institutions in both the public and private sectors.

As time passed, Thailand began to produce more graduates, resulting in a decreased demand for graduate studies within the country. This created an opportunity to serve countries still in need of qualified individuals in this field. Moreover, this presented a chance to foster collaboration for future research development. As a result, a new Master of Science (International Program) in Parasitology was launched, welcoming students from all over the world and using English as the primary language of instruction. This international program was first offered in 2015 and has been continuously revised, with the most recent update being the 2020 curriculum.

5.3 The benefits that will arise from the knowledge and experience gained from Master of Science Program in Parasitology (International Program)

The Master of Science Program in Parasitology (International Program) aims to produce graduates with comprehensive and up-to-date knowledge in medical parasitology that meets the current demands of the market. Graduates will be equipped with the potential to become researchers capable of integrating knowledge from various fields to conduct research and systematically generate new knowledge. They will also possess the skills to apply their expertise in diagnosing diseases, preventing and controlling diseases, thus

contributing to the continuous and sustainable improvement of people's quality of life and the national and international economy. Graduates will be able to communicate and present effectively at an international level, demonstrate leadership in academia, uphold moral and ethical standards, and adhere to academic ethics and laboratory standards fully.

5.4 The potential and capabilities of the organization, including expertise, excellence, and readiness in terms of knowledge, personnel, and facilities

The Master's degree program in Parasitology at Chiang Mai University offers a more diverse range of elective courses compared to similar programs at other institutions, especially in the field of medical entomology. Diseases transmitted through vector-borne infections, such as dengue fever and malaria, remain significant public health issues. Since 2018, the department established the Center of Insect Vector Study, which was later renamed in 2024 to the Parasitology and Entomology Research Cluster (PERC) to encompass broader areas of study. The faculty and research team, comprising both domestic and international researchers as well as graduate students, conduct studies in parasitology and entomology, which can be categorized into five key areas:

Protozoa and Helminths: Focusing on parasitic diseases found in hospital patients, with collaborations in clinical diagnosis to ensure timely and accurate treatments.

Mosquitoes: Researching mosquito taxonomy, molecular genetics, vector competence, susceptibility to insecticides, and mechanisms of insecticide resistance.

Flies: Studying flies with medical importance and forensic entomology.

Black Flies: Investigating taxonomy, biology, ecology, molecular genetics, vector potential, and salivary gland proteins that cause allergic reactions in people bitten by black flies.

Herbal Products for Parasite and Vector Control: Researching plants and plant extracts that are effective in killing parasites and mosquitoes at different stages, and in preventing mosquito bites, without harmful side effects to users or the environment. These studies aim to develop high-efficiency formulations for practical use in communities and commercial industries.

Preparation for the management and teaching of the curriculum involves the committee responsible for the program taking into account various suggestions from student satisfaction surveys regarding the teaching and management of the program. These suggestions serve as a guideline for preparing in areas such as facilities, instructional media, the learning environment, safety, and research tools. The department provides lecture rooms, laboratories, computer rooms, libraries, and student lounges.

In terms of safety, the program requires all students to participate in laboratory biosafety training, organized by the university, as a prerequisite before working on their thesis. To support students in achieving learning outcomes such as integrating parasitology knowledge with other relevant fields and employing modern techniques essential for research, the curriculum has updated some courses to align with current needs and expectations of stakeholders. Students can enroll in these updated elective courses under the guidance of their academic advisors.

To encourage teamwork, leadership, and responsibility, the department promotes student participation in various activities such as Children's Day events and community service. Each student is assigned different roles in organizing these activities. For self-directed learning, students have access to resources through the faculty library's information system, which purchases materials each year.

Additionally, the department's website offers e-books, and students can borrow related textbooks from both the departmental and faculty libraries. Regarding scientific research tools, the department surveys faculty needs to plan annual budget requests for equipment purchases, focusing on the current research mission.

6. Objectives:

6.1 Students possess knowledge, skills, and expertise in the field of medical parasitology, both theoretically and practically, enabling them to perform their professional duties efficiently. They are capable of diagnosing and accurately providing medical parasitology information to society in an appropriate manner.

6.2 Students can integrate knowledge from various disciplines to create research outcomes and develop new knowledge or innovations aimed at solving problems caused by medically significant parasites or insects.

6.3 Students demonstrate critical judgment through systematic thinking. They are adept at researching, collecting, and applying software programs for data analysis, synthesizing and summarizing knowledge points to develop research projects and appropriately address problems.

6.4 Students are proficient in using English for communication and can effectively present their work at an international level.

6.5 Students exhibit academic leadership qualities, responsibility, research ethics, academic integrity, and uphold the importance of safety standards in laboratory settings.

7. Course Synopsis and Methodology:

7.1 Study plan

Plan 1 (Academic Type)

Degree Requirements **36 Credits**

A. Thesis

317797	Master' s Thesis	36 Credits

B. Academic Activities

1. A student has to organize a seminar and present in English on the topic related to his/her thesis once every semester for at least 4 semesters and students have to attend seminar every semester that the course is offered until graduation.
2. A student has to participate in training on research ethics on human subjects and ethics on animal research provided by the Faculty or University under suggestion of supervisor.
3. Thesis work or part of a thesis must be published, or at least accepted to be published, in an international journal with peer review **and** the student's name must be listed as the first author of at least 1 thesis publication **or** have a patent under Chiang Mai University's criteria. The affiliations of works must be specified as "Department of Parasitology, Faculty of Medicine, Chiang Mai University".
4. A student must present a thesis work or part of a thesis work, at an international academic conference in the field of study at least once.
5. A student must present a thesis progress to the graduate committee board of the Department of Parasitology every semester.
6. A student must report their academic results according to the report format of Chiang Mai University every semester, with the approval of the Graduate Education Committee of the Faculty, then collect and submit the reports to the Chiang Mai University every semester.

C. Non-credit Courses

1. Chiang Mai University requirement English language

2. Program requirement graduate — The student may enroll other courses(s) as visitor (V) under the agreement of the advisor.

D. Comprehensive Examination

1. The student must pass the comprehensive examination. To take the examination, the student must submit the request form, approved either by a general advisor or thesis advisor.
2. Students who do not pass the examination are entitled to a second opportunity for a re-examination by submitting a request for re-examination. The re-examination must be completed within the next academic semester following the first examination.

Plan 2 (Academic Type)

Degree Requirements		a minimum of	**36 credits**
A. Course work		a minimum of	**24 credits**
1. Graduate Courses		a minimum of	24 credits
1.1 Field of Specialization		a minimum of	16 credits
1.1.1 Required courses			16 credits
317701	Medical Protozoology		2 credits
317702	Medical Helminthology		2 credits
317703	Medical Entomology		2 credits
317704	Laboratory Techniques in Medical Parasitology		2 credits
317791	Seminar in Parasitology 1		1 credit
317792	Seminar in Parasitology 2		1 credit
317816	Basic Molecular Genetic Techniques for Parasitology Research		3 credits
317817	Research Design and Methodology in Parasitology		3 credits
1.1.2 Elective courses		a minimum of	8 credits

317794	Special Problems in Parasitology 1	3 credits
317795	Special Problems in Parasitology 2	3 credits
317813	Research Techniques in Medical Entomology	3 credits
317814	Taxonomy of Anopheline Mosquitoes	3 credits
317818	Taxonomy of *Culex* Mosquitoes	2 credits
317819	Taxonomy of Aedini Mosquitoes	2 credits
317839	Current Topics in Parasitology	3 credits

Student can enroll the followings courses or the others which the graduate education executive committee approves

1.2 Other courses a minimum of 6 credits

1.2.1 Required courses None

1.2.2 Elective courses a minimum of 6 credits

The student may enroll other graduate courses(s) under the agreement of the advisor

2. Advanced Undergraduate Courses (if any) credits

In case the student lacks some basic knowledge, which is necessary for education, the student must enroll some advanced undergraduate courses(s) under the recommendation of program administrative committee

B. Thesis

317799	Master' s Thesis	12 credits

C. Non-credit Courses

1. Chiang Mai University requirement English language
2. Program requirement None

D. Academic Activities

1. A student has to organize a seminar and present in English on the topic related to his/her thesis once every semester for at least 2 semesters and students have to attend seminar every semester that the course is offered until graduation.

2. A student has to participate in training on research ethics on human subjects and ethics on animal research provided by the Faculty or University under suggestion of supervisor.
3. Thesis work or part of a thesis must be published, or at least accepted to be published, in an international journal **or** in national journals listed in the TCI Tier 1 database **or** in full paper in the proceedings of international conferences accepted in the field of study **and** the student's name must be listed as the first author of at least 1 thesis publication **or** have a patent under Chiang Mai University's criteria. The affiliations of works must be specified as "Department of Parasitology, Faculty of Medicine, Chiang Mai University".
4. A student must present a thesis progress to the graduate committee board of the Department of Parasitology every semester.
5. A student must report their academic results according to the report format of Chiang Mai University every semester, with the approval of advisory committee.

E. Comprehensive Examination

1. The student must pass the comprehensive examination. To take the examination, the student must submit the request form, approved either by a general advisor or thesis advisor.
2. Students who do not pass the examination are entitled to a second opportunity for a re-examination by submitting a request for re-examination. The re-examination must be completed within the next academic semester following the first examination.

7.2 Course Content

317701 Medical Protozoology 2(1-2-3)

Protozoa causing human diseases, classification, morphology, life cycle, geographical distribution, modes of transmission, pathogenesis and pathology, laboratory diagnosis, prevention and control

317702 Medical Helminthology 2(1-2-3)

Helminths causing human diseases, classification, morphology, life cycle, geographical distribution, modes of transmission, pathogenesis and pathology, laboratory diagnosis, prevention and control

317703 Medical Entomology 2(1-2-3)

Classification and identification, morphology, physiology, life cycle, medical importance, prevention and control of arthropods

317704 Laboratory Techniques in Medical Parasitology 2(1-2-3)

Various basic laboratory methods and technical details for diagnosis of parasitic diseases and for research

317791 Seminar in Parasitology 1 1(1-0-2)

Presentations of updated research articles on protozoology, helminthology and entomology from international journals and approved by advisor, comment the article and answer the questions, following by discussion and presented in English.

317792 Seminar in Parasitology 2 1(1-0-2)

Presentations of updated research articles on protozoology, helminthology and entomology from international journals and approved by advisor, comment the article and answer the questions, following by discussion and presented in English.

317794 Special Problems in Parasitology 1 3(0-9-0)

A self-study course in areas of special interest under the supervision and guidance of individual staff members, literature review, analysis and searching of problems leading to the creation of questions and assumptions of new research, designing of research processes and methodology, data collection, experimentation, data analysis and Interpretation, and developing proposals to solve problems, the topics chosen not to be used as part of the student's thesis or independent research

317795 Special Problems in Parasitology 2 3(0-9-0)

A self-study course in areas of special interest under the supervision and guidance of individual staff members, literature review, analysis and searching of problems leading to the creation of questions and assumptions of new research, designing of research processes and methodology, data collection, experimentation, data analysis and Interpretation, and developing proposals to solve problems, the topics chosen not to be used as part of the student's thesis or independent research

317813 Research Techniques in Medical Entomology 3(1-6-5)

Techniques for research in medical entomology, collection and preservation of insects, insect rearing, insecticide susceptibility test, and other techniques

317814 Taxonomy of Anopheline Mosquitoes 3(1-6-5)

Use of mosquito keys for identification of larvae and adults of Anopheline mosquitoes in Thailand

317816 Basic Molecular Genetic Techniques for Parasitology Research 3(1-4-4)

Basic knowledge about molecular genetics, Theory and skill practicing of basic techniques in molecular genetic research, Selection and design the appropriate molecular genetic techniques for the parasitology research

317817 Research Design and Methodology in Parasitology 3(3-0-6)

Basic knowledge and concepts of research, research plan, searching for references, formulating research questions and objectives, designing experiments, experimental plans, data collection, statistical analysis, manuscript preparation and submission, and research ethics

317818 Taxonomy of *Culex* Mosquitoes 2(1-2-3)

Use of mosquito keys for identification of larvae and adults of *Culex* mosquitoes in Thailand

317819 Taxonomy of Aedini Mosquitoes 2(1-2-3)

Use of mosquito keys for identification of larvae and adults of Aedini mosquitoes in Thailand

317839 Current Topics in Parasitology 3(1-4-4)

This course aims to provide students with knowledge and understanding of current research trends in parasitology. Students learn the theories and principles of modern technology that can be applied in parasitology research

317797 Master's Thesis 36 Credits

The Master's thesis course for plan 1 prepare student to gain knowledge of research ethics, biosafety, theories and principles of research tools and methodology by providing training and encouraging self-learning to promote students to create the dissertation proposal topics. Students conduct research to create a new knowledge by emphasizing responsibility for one's own role and society. Students present academic work using information tools or computer programs for research interpretation, integration of research results and presenting research results with a critical assessment of the acquired knowledge.

317799 Master's Thesis 12 Credits

The Master's thesis course for plan 2 prepare student to gain knowledge of research ethics, biosafety, theories and principles of research tools and methodology by providing training and encouraging self-learning to promote students to create the dissertation proposal topics. Students conduct research to create a new knowledge by emphasizing responsibility for one's own role and society. Students present academic work using information tools or computer programs for research interpretation, integration of research results and presenting research results with a critical assessment of the acquired knowledge.

8. Graduation Conditions:

Plan 1 (Academic Type)

1. A student has to organize a seminar and present in English on the topic related to his/her thesis once every semester for at least 4 semesters and students have to attend seminar every semester that the course is offered until graduation.
2. A student has to participate in training on research ethics on human subjects and ethics on animal research provided by the Faculty or University under suggestion of supervisor.
3. Thesis work or part of a thesis must be published, or at least accepted to be published, in an international journal with peer review **and** the student's name must be listed as the first author of at least 1 thesis publication **or** have a patent under Chiang Mai University's criteria. The affiliations of works must be specified as "Department of Parasitology, Faculty of Medicine, Chiang Mai University".
4. A student must present a thesis work or part of a thesis work, at an international academic conference in the field of study at least once.
5. A student must present a thesis progress to the graduate committee board of the Department of Parasitology every semester.
6. A student must report their academic results according to the report format of Chiang Mai University every semester, with the approval of the Graduate Education Committee of the Faculty, then collect and submit the reports to the Chiang Mai University every semester.

Plan 2 (Academic Type)

1. A student has to organize a seminar and present in English on the topic related to his/her thesis once every semester for at least 2 semesters and students

have to attend seminar every semester that the course is offered until graduation.

2. A student has to participate in training on research ethics on human subjects and ethics on animal research provided by the Faculty or University under suggestion of supervisor.
3. Thesis work or part of a thesis must be published, or at least accepted to be published, in an international journal **or** in national journals listed in the TCI Tier 1 database **or** in full paper in the proceedings of international conferences accepted in the field of study **and** the student's name must be listed as the first author of at least 1 thesis publication **or** have a patent under Chiang Mai University's criteria. The affiliations of works must be specified as "Department of Parasitology, Faculty of Medicine, Chiang Mai University".
4. A student must present a thesis progress to the graduate committee board of the Department of Parasitology every semester.
5. A student must report their academic results according to the report format of Chiang Mai University every semester, with the approval of advisory committee.

9. Applicant Qualifications

Plan 1 and 2 (Academic Type)

9.1 In accordance with Chiang Mai University's announcement regarding student admissions for each academic year.

9.2 Must have completed a bachelor's degree or equivalent (with a cumulative GPA of no less than 2.50 or equivalent) in the field of health sciences, biological sciences, or other scientific disciplines from an internationally institution.

9.3 Must meet the foreign language requirements as per the announcement.

English language scores for thesis proposal submission/graduation: such as CMU-eTEGS (65); IELTS (5.5); TOEFL (ITP 523; CBT 193; IBT 69; DynEd 3.0 (CEFR = C1)

9.4 Must pass either a written exam on fundamental knowledge in Parasitology or an interview conducted by a committee appointed by the graduate committee board of the Department of Parasitology

9.5 Other qualifications are subject to the discretion of graduate committee board of the Department of Parasitology.

10. Document Required

- Application forms for scholarships and medical reports can be found in detail on the website: https://tica-thaigov.mfa.go.th/en/page/75500-tipp-application-form?menu=605b13dbb6f1b76ed31778b3
- Transcript
- Recommendation Letter
- English Test

11. Contact:

11.1 Associate Professor Dr. Atiporn Saeung, Department of Parasitology, Faculty of Medicine, Chiang Mai University (atiporn.s@cmu.ac.th)

11.2 Associate Professor Dr. Anuluck Junkum, Department of Parasitology, Faculty of Medicine, Chiang Mai University (anuluck.j@cmu.ac.th)