Course Deatail
Master of Engineering Program in Biomedical Engineering (Interdisciplinary)

Course Title:	Master of Engineering Program in Biomedical Engineering (Interdisciplinary)
Master Degree:	Master of Engineering (Biomedical Engineering) (Type 2 (Plan A Type A2))
Academic Institution:	Biomedical Engineering Institute, Chiang Mai University
Duration:	2 Years (June 2024 - March 2026)

Background and Rationale:

Biomedical Engineering is an integrated knowledge between engineering, health science, physical science, mathematics, statistics, computer science, information technology and the future trend technologies. This integration can be implemented through analysis, research, communication, and innovation development in biomedical engineering area. This form of integration innovation can be applied or used in any real circumstances in the nation or international cases. This knowledge can be used to improve or enhance the quality of life of the present and the future humanities following the United Nations (Sustainable Development Goals; SDGs).

Hence, the Biomedical Engineering program (Master of Engineering: International program/Interdisciplinary) aims to produce new quality researcher/scientists in a field of Biomedical Engineering. This program is designed to have learning process in theoretical aspects of Engineering, Health Science, and Science in lecture rooms and laboratories. This program is emphasizing in using the engineering knowledge in medical science applications. The program emphasizes in Medical Imaging, Medical Image Processing, Medical Signal Processing, Bioinformatics, Biomechanics, Cell and Tissue Engineering, Cardiac Electrophysiology and Biomaterials. The Biomedical Engineering program will also help in the process of developing and maintaining biomedical engineering devices. These developed devices will be more suitable to physical body of Thai people and the environment in Thailand.

Objectives:

1. To produce university postgraduates who have knowledge in theoretical and practical aspects in the field of Biomedical Engineering emphasizing in Medical Imaging, Medical Image Processing, Medical Signal Processing, Bioinformatics, Biomechanics, Cell and Tissue Engineering, Cardiac Electrophysiology and Biomaterials by applying the engineering knowledge to health science applications. In addition, these university postgraduates should be able to do research leading to the any health science application.
2. To produce quality and moral university postgraduates who can serve the country by utilizing their knowledge in developing effective medical devices.
3. To produce university postgraduates who have abilities in doing research in the area of Biomedical Engineering that will be the basis of self-supported technology in the future.

Course Synopsis and Methodology:

Course Content

Type 2 (**Plan A Type A 2**)

Degree Requirements **a minimum of** **36 credits**

A. **Coursework**

1. Graduate Courses

1.1 Field of Specialization

1.1.1 Required courses

Required placement courses

For Engineering or Science graduated student

Human Anatomy and Physiology for Biomedical Engineering
Introduction to Biomedical Engineering Laboratory

For Health Science graduated student

Engineering Fundamentals for Biomedical Engineering
General required courses
Mathematics for Biomedical Engineering
Research Methodology in Biomedical Engineering
Cellular and Molecular Physiology for Biomedical Engineering
Seminar in Biomedical Engineering

1.1.2 Elective courses .

Digital Signal Processing for Biomedical Engineering
Genetic Algorithms
Evolutionary Computation
Computational Intelligence for Biomedical Engineering
Medical Imaging
Biomedical Image Processing and Analysis
Fluid Biomechanics
Solid Biomechanics
Biomedical Instrumentation
Introduction to Musculo-skeletal Biomechanics
Mechanics of Bone
Finite Element Modeling of Biological Engineering
Cardiopulmonary Biomechanics
Cardiac Mechanics
Introduction to Tissue Engineering
Cell Biology and Tissue Engineering
Biomaterial for Biomedical Engineering
Biosensor for Biomedical Engineering
Nanotechnology for Biomedical Engineering
Biomimetic Material
Controlled-Release Drug Delivery System
Selected Topics in Biomedical Engineering
Selected Topics in Medical Imaging
Selected Topics in Bioinformatics
Selected Topics in Biomechanics
Selected Topics in Cell and Tissue Engineering
Selected Topics in Biomaterial
Selected Topics in Biomedical Engineering 1
Selected Topics in Medical Imaging 1
Selected Topics in Bioinformatics 1
Selected Topics in Biomechanics 1
Selected Topics in Cell and Tissue Engineering 1
Selected Topics in Biomaterial 1

NOTE A student may enroll in some graduate courses outside the list above but these courses have to be in related areas to enhance his/her capability in conducting his/her research according to the advisor with the approval of the Graduate Program Administrative Committee. These courses can be counted as elective courses toward the degree. However, a student must enroll in elective courses of the Biomedical Engineering at least 9 credits.

1.2 Other courses

A student may enroll other graduate courses(s) according to the program administrative committee.

2. Advanced Undergraduate Courses (if any)

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

C. Non-credit Courses

1. Graduate School requirement: - a foreign language -
2. Program requirement - none

D. Academic Activities

The whole or part of a thesis must be published/ accepted for at least 1 international publication in ISI, Scopus, IEEE, PubMed, or Web of Science databases with the student's name as the first author. OR the whole or part of a thesis must be presented in an international conference with proceedings at least 1 full academic paper (peer-reviewed) with the student's name as the first author.

Graduation Conditions:

1. A student must pass the foreign language requirement as set by the Graduate School.
2. A student must have met all of the requirements set by the study program.
3. Earning accumulated grade point average (GPA) of at least 3.00 for all courses taken, and GPA of not less than 3.00 for the chosen of specialization.
4. A student must successfully defend a thesis. The Thesis's defend allows general public to attend.
5. The whole or part of a thesis must be published/accepted for at least 1 publication in ISI, Scopus, IEEE, PubMed, or Web of Science databases with the student's name as the first author. OR the whole or part of a thesis must be presented in an international conference with proceedings at least 1 full academic paper (peer-reviewed) with the student's name as the first author.
6. A student has met the qualifications as outlined in the Chiang Mai University regulation on Student Honors in order to receive the degree or diploma or higher diploma level, 2007.

Applicant Qualifications

1. To be in accordance with the Chiang Mai University Announcement on Admission in each academic year.
2. Earn a Bachelor of Engineering, Bachelor of Science bachelor degree in Health Science or Bachelor degree in Medical Science or equivalent degree.
3. Be able to study in the courses that are taught in English.
4. Other characteristics are to be considered by the Graduate Program Administrative committees.

Document Required

- TIPP application form (Download at: https://tica-thaigov.mfa.go.th/en/page/75500-tipp-application-form?menu=605b13dbb6f1b76ed31778b3)
- Medical Report (If candidates had submitted other health certificates without the TICA medical report form, their application will not be accepted for consideration)
- Transcript of Bachelor's degree (to show the courses that you have learnt throughout Bachelor's degree)
- Certificate of Bachelor's degree
- English test score (IELTS 6, TOEFL (IBT 6.5) , (PBT 400) , International program within 2 years)
- Recommendation Letter (At least 3 people)

Contact: Ms. Sawanya Amonpongraksa
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***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.