

Degree  Bachelor  Master  Doctoral

Department of Biomedical Engineering, Faculty of Engineering

TQF 2 Bachelor of Engineering Program in Biomedical Engineering (International Program, Multidisciplinary Program)

## Mahidol University Degree Profile

Bachelor's Degree Program	
1. Name of the program (Thai) หลักสูตรวิศวกรรมศาสตรบัณฑิต สาขาวิชาวิศวกรรมชีวการแพทย์ (หลักสูตรนานาชาติ, หลักสูตรพหุวิทยาการ) (English) Bachelor of Engineering Program in Biomedical Engineering (International Program, Multidisciplinary Program)	
2. Degree Name (Thai) วิศวกรรมศาสตรบัณฑิต (วิศวกรรมชีวการแพทย์) (English) Bachelor of Engineering (Biomedical Engineering)	
General information of the program	
Type of the program	Academic Program
Required number of credits	The number of credits required for the program is at least 138 Credits.
Studying duration / program round	four-years program
The program's status and opening schedule	1. เป็นหลักสูตรปรับปรุง พ.ศ. 2563 2. เริ่มใช้ในภาคการศึกษาที่ 1 ปีการศึกษา 2563 เป็นต้นไป
Degree granting	Bachelor's degree
Degree-granting Institutions (MOU with other institutions)	Mahidol University
Organizations certifying the standard	
Specific information of the program	
Purpose / Goals / Objectives	To produce students with the engineering knowledge necessary for solving biomedical problems and conducting experiments. Research activities include applied neural control/rehabilitation engineering, biomaterials, drug delivery, biomedical sensors and biomedical image processing, biomechanics, robotics.  To provide the knowledge, competences and skills of Biomedical Engineering and can deal



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	<p>with problems in engineering or medicine and recognize the needs of society and the international community.</p> <p>To provide a student with the knowledgeable of the regulations regarding medical engineering and are recognized in order to compete internationally.</p> <p>To provide a student with a research-based knowledge about the application of various disciplines to connect and serve the needs of medical engineering industry.</p> <p>To provide a student with a leadership, visionary, and skilled in the use of various technologies appropriately and effectively.</p> <p>To encourage ASEAN students to enroll in the course and provide technical cooperation and research internationally.</p> <p>To provide the engineering knowledge necessary for solving biomedical problems and conducting experiments.</p>
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Specific information of the program	
Distinctive Features	<p>This program has been developed as a multi-disciplinary, project- and research-based program established on strong collaboration with schools of medicine and success and long history of graduate programs.</p> <p>This program has three plans. Students in Plan B will be able to register graduate courses during their fourth year. Students in plan C will have dual degree from Mahidol University and University of Strathclyde.</p>
Educational system	Class room mode
Graduates' advancement	
Obtainable jobs	<p>The biomedical engineering graduates may have careers in</p> <ol style="list-style-type: none"> <li>1) Medical Device Company: Product specialist, R&amp;D engineer, etc.</li> <li>2) Researcher in Biomedical Engineering or a related fields</li> <li>3) Entrepreneurs in Medical Industry and Technology</li> <li>4) Officials in government agency in the field of Biomedical Engineering or related fields</li> </ol> <p>Biomedical Engineer</p>
Further fields of study	<ul style="list-style-type: none"> <li>- Department of Biomedical Engineering and related engineering fields in leading university around the world.</li> <li>- Different fields according to department research tracks including Neuroengineering and Medical Imaging, Tissue Engineering and Drug Delivery System, Advanced Computing in Medicine, Rehabilitation Engineering and Artificial Organs, Robotics and Computer-Integrated Surgery, biosensors and Medical Instrumentation.</li> </ul>



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Philosophy in program administration	
Educational philosophy	Our primary focus is on educating the learners, as for them to attain academic achievement through learning-centered education, outcome-based education and constructivism. To become a wisdom graduate, learners combine what they have learned so far with the new knowledge, and with experiential learning activities.
Philosophy in program administration	
Strategy / teaching guidelines	The course aims to promote research-based education, creative problem solving, leadership, morality and ethics and multidisciplinary research to the international level. The program will provide resources such as faculty and workplace that serve research-based and outcome-based education. Teaching strategies includes Lecture, Group discussion, Self-study, case study, problem-based learning, Lab practice, internship, site visitation, Project-based learning, and Senior project.
Strategy / student's evaluation guidelines	Written examination (MCQ, SA, MEQ, Eassy), Rubrics (product, project, group, team, research-based assessment; work assignment; continuous internal assessment), Oral presentation, Report.



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Competences provided to the students	
Generic Competences	<ul style="list-style-type: none"> <li>- Communication proficiency: Apply knowledge in the fields of profession in order to communicate to social in appropriate issues and present research works in publicity.</li> <li>- Critical thinking: Identify and formulate problems, make use of other data supporting decision making and make appropriate judgment.</li> <li>- Morality and ethics: Demonstrate awareness of morality and ethnics; especially in research involved with human or animal experiments</li> <li>- Creative problem solving: Ability to discuss different issues through divergent and convergent thinking then suggest inventive solutions in the class or to the lecturer.</li> </ul>
Subject-specific Competences	<ul style="list-style-type: none"> <li>- Design &amp; Innovation: Apply principles of science and engineering in the engineering design process and have innovation in the developing and existing knowledge creatively.</li> <li>- Research proficiency: Ability to do use proper research methodology including literature search, evaluate and utilize information with ethic and systemic thinking, analyze and interpret data and draw conclusions.</li> <li>- Teamwork: Ability to participate in academic activity as a team which can establish goals, plan tasks, meet deadline, and analyze risk and uncertainly.</li> <li>- Independence: Ability to function independently and self-directed to explore knowledge and technology.</li> </ul>



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Graduates' learning outcomes	
PLOs	<p><b>Plan A: Regular program and Plan C: Dual degree</b></p> <p>On successful completion of this program, graduate will be able to:</p> <p>PLO1 Solve engineering problems specialty for biomedical engineering by applying principles of engineering, science, and mathematics.</p> <p>PLO2 Apply both analysis and synthesis in the engineering design process, resulting in designs for biomedical engineering.</p> <p>PLO3 Conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.</p> <p>PLO4 Communicate effectively with related audiences</p> <p>PLO5 Recognize ethical and professional responsibilities in biomedical engineering situations and make informed judgments, which must consider the impact of biomedical engineering globally.</p> <p>PLO6 Recognize the ongoing need for additional knowledge in biomedical engineering and locate, evaluate, integrate, and apply this knowledge appropriately</p> <p>PLO7 Function effectively on teams that establish goals, plan tasks, meet deadline, and analyze risk and uncertainly.</p> <p><b>Plan B: Advanced academic program (หลักสูตรปริญญาตรีแบบก้าวหน้าทางวิชาการ)</b></p> <p>On successful completion of this program, graduate will be able to:</p> <p>PLO1 Solve engineering problems specialty for biomedical engineering by applying principles of engineering, science, and mathematics.</p> <p>PLO2 Apply both analysis and synthesis in the</p>



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	<p>engineering design process, resulting in designs for biomedical engineering.</p> <p>PLO3 Conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.</p> <p>PLO4 Communicate effectively with related audiences</p> <p>PLO5 Recognize ethical and professional responsibilities in biomedical engineering situations and make informed judgments, which must consider the impact of biomedical engineering globally.</p> <p>PLO6 Recognize the ongoing need for additional knowledge in biomedical engineering and locate, evaluate, integrate, and apply this knowledge appropriately</p> <p>PLO7 Function effectively on teams that establish goals, plan tasks, meet deadline, and analyze risk and uncertainty.</p> <p>PLO8 Function independently and self-directed to explore knowledge and technology for advanced research.</p>
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