แบบรายงานข้อมูลหลักสูตร

MU Degree Profile

Undergraduate Program	
1. Curriculum Name (Thai) วิทยาศาสตรบัณฑิต สาขาวิชาเคมี (หลักสูตรนานาชาติ) (English) Bachelor of Science Program in Chemistry (International Program)	
2. Degree Title (Thai) วิทยาศาสตรบัณฑิต (เคมี) (English) Bachelor of Science (Chemistry)	
Program Overview	
Curriculum Type/model	Bachelor's Degree (International program), Academic Program
Number of Credits	No less than 172 trimester credits
Duration	Four-year program
Program Status and Schedule of Program Start Dates	Revised program 2020 Program start: Trimester I Academic Year 2020
Degree Offered	One degree of one major with possiblility of dual-degree program or further study into master degree (See Distinctice Features section.)
Institution Offering Degree (collaboration with other institutions)	• Mahidol University • Flinders University, Australia (for the 2+2 option)
Organization Certifying the Standards of the Program	Not applicable/Not required
Specific Data of the Program	

Purpose / Goals / Objectives	**Goals:** To produce graduates with Chemistry skills and work ethics suitable up to and beyond as specified in Thai Qualification Framework (TQF) 1 and chemical societies of the Australia, Canada, UK and US. Graduates are expected to possess four characteristics desired for MU graudates and personnel as follows: 1) T-shaped (having knowledge in breadth and depth) 2) globally talented 3) soically contributing 4) entrepreneurially minded and possess soft skills required by MU such as MU-HIDEF. **Objectives:** To produce graduates who are able to: 1) Work for local and global employment in the chemical industry or related areas, or pursue higher degree in Chemistry or in allied fields, such as medicine, dentistry, pharmacy, chemical and petrochemical engineering, environmental areas. 2) Think critically and solve problem that relate to chemical and other scientific applications, and understand the underlying theoretical principles governing the chemical behavior at the atomic, molecular and macroscopic levels. 3) Conduct experiments and select laboratory tools under safety protocols including preparative techniques, methods for handling/disposing chemicals and wastes, modern instrumentations and the interpretative handling of data. 4) Design and conduct research in chemistry scientifically and ethically to solve problem in real-life situations. 5) Communicate and collaborate with technical/non-technical people effectively for chemistry-related work.

	6) Make use of technology to increase productivity and automation of chemistry-related work.
Distinctive Features	The new chemistry curriculum places greater emphasis on flexible education and compliance to accreditation standards. Students have a greater number of choices to mix and match to their needs and employer's expectation. The requirements are tailor made so that it is in compliance with published guidelines from all major chemical societies. As a chemistry international program, emphasizing research, analytical-thinking and problem solving, the following three pathways are offered: a) One degree of chemistry: The courses may be completed in approximately three years for high achievers. b) Two degrees with Flinders University, Australia in 2+2 dual degree arrangement c) Two degrees in 4+1 arrangement with Faculty of Graduate studies, Mahidol University (Master of Science in Pharmacology at Siriraj Hospital)
Academic System	Trimester system
Advancement Path of the Graduates	
Career Opportunities	Graduates of the international bachelor chemistry program can find employment in two areas **Academic and research career** 1) Research scientists or research assitants in private sector and governmental services department 2) Science teachers in primary and secondary education

	Industry and business carreer 3) Quality control/assurance or product development positions in local and multinational chemical, petrochemical, environmental, pharmaceutical and cosmetic science manufacturing and related industries such as public health and medicine. 4) Customer relations and as technical-support, sales and marketing for local and international chemical, petrochemical, pharmaceutical and cosmetic science related companies 5) Entrepreneurship in applied chemical and cosmetic industries.
Further Study after graduation	Graduates of the international bachelor chemistry program can study M.Sc., M.A. or Ph.D. abroad or in Thailand in chemistry, chemical engineering, petroleum, material, pharmaceutical, environment and cosmetic science fields and related fields including innovation management and MBA abroad or in Thailand.
Educational Management System	
Program Philosophy	Graduates will be world citizens who apply knowledge and skills in chemistry for the benefit of mankind and the betterment of global society. In concert with UN's SDG and Thailand 4.0 vision, the chemistry program produces graduates with lifelong learning habits through Mahidol University's constructivist learning philosophy, outcome-based education (OBE) and leaner-centered education.
Strategy/ Practice in teaching and learning	Our philosophy is implemented via MUIC's liberal arts philosophy and supportive student-faculty interactions, and achieved via interactive lectures, laboratory practicals, individual and group discussions and assignments and

	active research projects with emphasis on student's demonstration of ideas, logical reasoning, problem-analysis and problem-solving and applying the solution to the problem.
Strategy/Practice for Evaluating Learning Outcomes of Students	Different methods of formative and summative evaluation are used such as written and oral examination, practical test, oral presentation, individual or group class participation and project-based research learning. Rubrics based on the objectives of the course are used to score the students' achievement. Students receive grades according to the criteria stated in Mahidol University's regulations on undergraduate studies as well as MUIC's regulations and/or announcements.
Program Competency	
Generic Competences	**Critical thinking and Analysis:** a) Capable of analytical and critical thinking and asking pertinent questions in order to formulate lines of enquiry that drive problem solving b) Assess contradictory or relevant information, scientific observations and problems creatively and with logical and systematic reasoning c) Critical reading of scientific literature d) Able to comprehend and follow technical information **Creativity:** a) Able to create original, novel research or work that will further enhance existing knowledge **Communication:** a) Communicate orally in concise and grammatically correct English

	b) Write concisely and correctly in English c) Use appropriate presentation tools and visual aids in a cohesive and organized manner **Collaboration:** a) Collaborate professionally with team members b) Time management **ICT:** a) Information management skills b) Using presentation programs to deliver oral presentation c) Receive, reflect on and respond to different information types (e.g. textual, numerical, graphical) **Ethics:** a) Demonstrate moral and appropriate behavior b) Responsible conduct including awareness of plagiarism c) Awareness of current local and global issues d) Accountability e) Risk assessment, prevention and mitigation
Subject-specific Competences	a) Use knowledge in analytical chemistry, organic chemistry, inorganic chemistry, biochemistry, physical chemistry/chemical physics, material science, computational chemistry and computer programming, and be able to apply them effectively to solve problems in chemistry b) Practice and conduct experiments in analytical chemistry, organic chemistry, inorganic chemistry, biochemistry, physical chemistry/chemical physics, material science, computational chemistry and programming, and possess proper skills in handling

	instrumentations of these disciplines and adhere to standard laboratory safety practices, and chemical handling, including proper use of PPEs c) Recognize ethical issues related to chemistry, and apply accepted ethical standards to resolve issues, including confidentiality of data
Learning Outcomes of Graduates	
Program Learning Outcomes	At the end of the program, graduates will be able to 1.Apply knowledge in both basic and applied chemistry and related scientific disciplines to systematically solve problems involving chemistry in academia and industry. 2.Retrieve and appraise scientific literature critically and integrate information for problem solving and scientific research. 3. Effectively communicate chemistry-related concepts and student's own results and findings using professional English in both written and oral forms to both the technical and non-technical audience locally and globally 4. Demonstrate moral and ethical conduct as a collaborative scientist with integrity and professionalism. 5. Use the principles of chemical safety practices for health and the environment in accordance with national and international standards. 6. Carry out laboratory techniques and use instrumentations in chemistry and other sciences to experiment, verify theory or formulate meaningful original solutions to novel situations, as part of experimentation, analysis, or research.