



Program specification

Bachelor of Science Program in Medical Technology

Curriculum Last Revised in 2022

General information of the program

Program name	Bachelor of Science Program in Medical Technology
Name of Degree	Bachelor of Science (Medical Technology) Bs.Sc. (Medical Technology)
Institute	Burapha University, Faculty of Allied Health Sciences
Total credits	138 credits
Study duration	4 years, semester basis (two semesters)
Type of studying	Full-time, 5-days a week, in-class learning
Program accreditation	1. The Ministry of Higher Education, Science, Research and Innovation of Thailand 2. The Medical Technology Council of Thailand
Quality Assurance	1. Program level: AUN-QA (planned in 2023) 2. Institute level: EdPex
Program opened	In 2011
Program revised (latest)	In 2022

Program summary

The Bachelor of Science Program in Medical Technology was started in 2011. The program has consistently revolutionized its curriculum and learning process by incorporating competency-based learning and outcome-based learning. This served the important goal of producing well-rounded medical technologists who are eager for lifelong learning and can thrive in a constantly changing world, improving the quality and standard of education. The Bachelor of Science in Medical Technology is intended to instill in graduates the values of professional competence and a good attitude necessary for successful work in clinical laboratories, as well as to prepare them for careers in medical technology and health-related sciences. After completing an initial program of studies in basic science, the students will study a variety of medical technology and health-related sciences disciplines, including Clinical Chemistry, Clinical Microbiology, Clinical Microscopy, Immunology, Hematology, Transfusion Medicine, Molecular Biology, and Community Medical Technology. The Bachelor's degree in Medical Technology has been improved and developed at least every five years based on globalization, market demand, and regulation from related organizations like the Medical Technology Council and Burapha University. In accordance with Burapha University policy and AUN-QA, OBE was a major part of the most recent curriculum for 2021. The eight PLOs were developed to be responsive to all inputs and stakeholders and to focus on both general and specialized skills and knowledge. The curriculum has received certification from the Medical Technology Council and Burapha University. Thai Qualifications Framework for Higher Education, and AUN-QA have been used as tools to develop curricula and achieve academic excellence.

Program Philosophy

“Administering education that focuses on inculcating the learners through practice-based learning, as for student to gain experience in real-work environment, to be competent persons who are able to cope with the changes of the world, to engage in social accountability, and to be life-long learners” is the educational philosophy of Burapha university. The program philosophy has been set based on a believe that learning through practice-based and to be life-long learners, such as direct experience, analysis, research, learning through community will enable graduates to learn continuously, being conscious of the medical technical profession. The Medical Technology Degree, a Bachelor of Science program provide a variety of learning process including hands-one experience, medical laboratory practices, project-based/research-based learning, community-

based learning, that endorses professionally competent and ethical individuals who committed to life-long learning

Program Objective

After completing the Bachelor of Science program in Medical Technology, graduates will be well-rounded scholars in medical laboratory science that competently perform routine laboratory procedures for medical diagnosis, disease screening, follow-up on treatment results, disease prevention, health assessment and health promotion. Graduates are able to utilize the knowledge of medical technology science in medical technology profession and research processes. Graduates will work with a good conscience and attitude to the profession and potentially participate in interprofessional interactions for healthcare community. In addition, graduates will earn a concept of entrepreneurship in medical technology

Program Learning Outcomes

Upon completion of the program, graduates must be able to:

1. Demonstrate honesty, disciplines, responsibilities, public consciousness, moral behavior, and ethic in medical technology profession
2. Apply the principles of basic life sciences, health sciences, medical technology, and precision medicine to medical technology practice
3. Critically and systematically think, integrate medical technology professional and related knowledge for basic research, solve problems, improve work performances, or innovation in medical technology
4. Work as inter-professional team of health care as a team leader or a member with good relationships
5. Demonstrate the skills of lifelong learning
6. Use appropriate information technology for data searching, analyze, research, presentation, and solve problems
7. Communicate health knowledge and advice appropriate diagnosis method and laboratory result to professional healthcare, patients, and community
8. Perform the medical laboratory practices according to medical technology professional standards

Admission Requirements

1. High school diploma in mathematics and sciences
2. Thais or foreigners who communicate Thai proficiently

Expected learning outcomes, teaching strategy and assessment of the program

Learning outcomes	Teaching strategy	Assessment
1. Demonstrate honesty, disciplines, responsibilities, public consciousness, moral behavior, and ethic in medical technology profession	<ol style="list-style-type: none"> 1. Use case studies concerning on ethical issues related to various sectors 2. Being exemplary 	<ol style="list-style-type: none"> 1. Teaching observation 2. Participation in class activity 3. Feedback from stakeholders 4. Performance during examination
2. Apply the principles of basic life sciences, health sciences, medical technology, and precision medicine to medical technology practice	<ol style="list-style-type: none"> 1. Lecture based and assignment 2. Practical based have divide in 3 levels <ul style="list-style-type: none"> • Basic technique in laboratory • Basic technique in medical laboratory • Practice in medical technology 3. Problem-based learning from case studies 4. Simulation in medical laboratory 5. Medical technology training 	<ol style="list-style-type: none"> 1. Paper-based examination 2. Quiz 3. Teaching observation 4. Assignment or presentation in class 5. Feedback from stakeholders 6. Assessment of performance during clinical practice
3. Critically and systematically think, integrate medical technology professional and related knowledge for basic research, solve problems, improve work performances, or innovation in medical technology	<ol style="list-style-type: none"> 1. Lecture based 2. Practical based have divide in 3 levels <ul style="list-style-type: none"> • Basic technique in laboratory • Basic technique in medical laboratory • Practice in medical technology 3. Problem-based learning from case studies for integrated 4. Simulation in medical laboratory 5. Project-based learning to train the students in applying the appropriate knowledge and research methodology to solve research questions 	<ol style="list-style-type: none"> 1. Teaching observation 2. Paper-based examination 3. Assignment 4. Presentation 5. Feedback from stakeholders 6. Assessment of performance during clinical practice
4. Work as inter-professional team of health care as a team leader or a member with good relationships	<ol style="list-style-type: none"> 1. Practical based have divide in 3 levels <ul style="list-style-type: none"> • Basic technique in laboratory • Basic technique in medical laboratory • Practice in medical technology 2. Problem-based learning from case studies for group assignment 	<ol style="list-style-type: none"> 1. Teaching observation 2. Assignment 3. Presentation 4. Feedback from stakeholders 5. Assessment of performance during clinical practice

Learning outcomes	Teaching strategy	Assessment
	3. Simulation in medical laboratory 4. Project-based learning for community health check-up service 5. Medical technology training	
5. Demonstrate the skills of lifelong learning	1. Assignment or case study for integrated, data searching, use appropriate digital technology, communication and presentation 2. Organize activities to promote student's responsibility to themselves and to the community such as in class or groups of farmer community	1. Teaching observation 2. Assignment 3. Presentation 4. Feedback from stakeholders
6. Use appropriate information technology for data searching, analyze, research, presentation, and solve problems	1. Assignment or case study for integrated, data searching, use appropriate digital technology, communication and presentation 2. Organize activities to promote student's responsibility to themselves and to the community such as in class or groups of farmer community	1. Teaching observation 2. Assignment 3. Presentation 4. Feedback from stakeholders
7. Communicate health knowledge and advice appropriate diagnosis method and laboratory result to professional healthcare, patients, and community	1. Lecture and give example 2. Give assignments in various situation to promote skill in information technology application. 3. Set up presentation activities such as in-class presentation, seminar, and research presentation	1. Paper-based examination 2. Teaching observation 3. Assignment 4. Presentation 5. Feedback from stakeholders 6. Assessment of performance during clinical practice
8. Perform the medical laboratory practices according to medical technology professional standards	1. Practical based have divide in 3 levels <ul style="list-style-type: none"> • Basic technique in laboratory • Basic technique in medical laboratory • Practice in medical technology 2. Simulation in medical laboratory 3. Project-based learning for community health check-up service 4. Medical technology training	1. Paper-based examination 2. Teaching observation 3. Competency lab practice examination 4. Feedback from stakeholders 5. Assessment of performance during clinical practice

Program structure

1. General Education Courses	30	Credits
2. Required Courses	102	Credits
2.1 Basic Courses	34	Credits
2.2 Professional Courses	66	Credits
2.3 Professional Elective Courses	2	Credits
3. Free Elective Courses	6	Credits

Program courses

1. General Education Courses	30	Credits
1.1 Quality Life Skills courses	9	Credits
89510064 Wisdom of BUU		3(2-2-5)
89510264 Happiness and Values of Life		2(1-2-3)
89510364 Physical Well-being Management		2(1-2-3)
89510764 Love, Sex and Health		2(1-2-3)
1.2 Thai and Global Citizenship	12	Credits
89520164 Lateral Thinking Skill Development		2(1-2-3)
89520264 Thinking Process for Understanding Oneself and Others		2(1-2-3)
89520464 English for Communication		3(2-2-5)
89520564 Collegiate English		3(2-2-5)
89520764 Thai Language Skills for Communication		2(1-2-3)
1.3 Future Work Competency Development	9	Credits
89530064 Opportunities and Challenges for Future Careers		2(2-0-4)

*Select 2 courses for 4 credits from the following courses which focus on work skills.

89530164	Digital Skill	2(2-0-4)
89530264	Interactive Media Design	2(2-0-4)
89530364	Media Design and Presentation	2(2-0-4)
89530464	Mathematics for Smart Working Life	2(2-0-4)

89530564	Food Science	2(2-0-4)
89530664	Environmental Science	2(2-0-4)
89530764	Cosmetic Science	2(2-0-4)
89530864	Science Literacy	2(2-0-4)
89530964	Introduction to Science of Data	2(2-0-4)
89531064	Creativity and Innovation for Social Development	2(2-0-4)
89531164	Law for Worker and Business	2(2-0-4)
89531264	Management Functions	2(2-0-4)
89531364	Business Environment	2(2-0-4)
89531464	Organizational Structure Design	2(2-0-4)
89531564	Strategic Planning	2(2-0-4)
89531664	Performance Controlling	2(2-0-4)
89531764	Marketing for Entrepreneurship in the 21 st Century	2(2-0-4)
89531864	Consumer Behavior in Modern World	2(2-0-4)
89531964	Introduction to Accounting in Service Industry	2(2-0-4)
89532064	Introduction to Accounting in Manufacturing	2(2-0-4)
89532164	Introduction to Accounting in Merchandise	2(2-0-4)
89532264	Accounting	2(2-0-4)
89532364	Financial Statements	2(2-0-4)
89532464	Financial Report	2(2-0-4)
89532564	Business Taxation	2(2-0-4)
89532664	Human Resources Foundation	2(2-0-4)
89532764	Service Experiences Design	2(2-0-4)
89532864	Service Innovation Design	2(2-0-4)

* Integrated Courses	3	Credits
89539764	Entrepreneurship in the 21 st Century	3(0-0-9)

2. Required Courses		102	Credits
2.1 Basic Courses		34	Credits
30211364	Calculus		3(3-0-6)
30310764	Basic Chemistry		3(3-0-6)
30310864	Basic Chemistry Laboratory		1(0-3-1)
30312064	Organic Chemistry		2(2-0-4)
30315465	Fundamentals of Analytical Chemistry		2(2-0-4)
30315565	Fundamentals of Analytical Chemistry Laboratory		1(0-3-1)
30810664	Physics for Health Science		3(3-0-6)
68010164	Medical Biology		3(3-0-6)
68010264	Medical Biology Laboratory		1(0-3-1)
68010364	Basic Human Anatomy		2(2-0-4)
68010464	Basic Human Anatomy Laboratory		1(0-3-1)
68021664	Principle of Human Physiology		2(2-0-4)
68021964	Basic Pathology		2(2-0-4)
68022364	Biochemistry for Allied Health Sciences		2(2-0-4)
68022464	Biochemistry for Allied Health Sciences Laboratory		1(0-3-1)
68023364	Statistics and Biostatistics for Health Science		3(3-0-6)
68222165	Introduction to Microbiology		2(1-3-3)
2.2 Professional course		68	Credits
68221165	Basic Immunology		1(1-0-2)
68222265	Clinical Bacteriology		2(2-0-4)
68222365	Clinical Bacteriology Laboratory		1(0-3-1)
68223165	Clinical Chemistry I		3(3-0-6)
68223265	Clinical Chemistry Laboratory I		1(0-3-1)
68224165	Basic Hematology		1(1-0-2)
68224265	Basic Hematology Laboratory		1(0-3-1)
68224365	Clinical Parasitology		2(2-0-4)
68224465	Clinical Parasitology Laboratory		1(0-3-1)

68227165	Principle Use and Maintenance of Laboratory Instruments	1(0-3-1)
68231165	Clinical Immunology	2(2-0-4)
68231265	Clinical Immunology and Virology Laboratory	1(0-3-1)
68232165	Clinical Microbiology	1(1-0-2)
68232265	Clinical Bacteriology Laboratory	1(0-3-1)
68232365	Clinical Virology	1(1-0-2)
68232465	Clinical Mycology Laboratory	1(0-3-1)
68233165	Clinical Chemistry II	3(3-0-6)
68233265	Clinical Chemistry Laboratory II	1(0-3-1)
68234165	Clinical Hematology I	2(2-0-4)
68234265	Clinical Hematology Laboratory I	1(0-3-1)
68234365	Clinical Hematology II	2(2-0-4)
68234465	Clinical Hematology Laboratory II	1(0-3-1)
68234565	Urine and Body Fluid Analysis	1(1-0-2)
68234665	Urine and Body Fluid Analysis Laboratory	1(0-3-1)
68235165	Transfusion Science I	2(2-0-4)
68235265	Transfusion Science Laboratory I	1(0-3-1)
68236165	Toxicology and Occupational Health	2(1-3-3)
68237165	Techniques in Molecular Biology	2(1-3-3)
68237265	Human Genetics and Personalized Medicine	2(1-3-3)
68237365	Pharmacology for Medical Technology	1(1-0-2)
68238165	Research Methodology	1(1-0-2)
68245165	Transfusion Science II	2(2-0-4)
68245265	Transfusion Science Laboratory II	1(0-3-1)
68246165	Clinical Correlation	1(1-0-2)
68246265	Quality System and Clinical Laboratory Management	2(2-0-4)
68247165	Professional Law and Ethics	1(1-0-2)
68247265	Health Informatics and Its Application	2(1-3-3)
68248165	Medical Technology Seminar	1(0-2-1)

68248265	Research Projects	2(0-6-2)
68249165	Community Medicine	2(0-6-2)
68249265	Practical in Medical Technology	1(0-3-1)
68249365	Medical Technology Training	7(0-28-7)
2.3	Professional Elective Courses	2 Credits
68247365	Forensic Science	2(2-0-4)
68247465	Cell Technology in Medicine	2(1-3-3)
68247565	Entrepreneurship in Health Business	2(2-0-4)
3.	Free elective courses no less than	6 Credits

Study plan

Courses to be enrolled in each semester of academic years as follows:

The first year: semester 1		
Course	Credits (lecture-practice-selfstudy)	
89510264	Happiness and Values of Life	2(1-2-3)
89520164	Lateral Thinking Skill Development	2(1-2-3)
89520464	English for Communication	3(2-2-5)
30211364	Calculus	3(3-0-6)
30310764	Basic Chemistry	3(3-0-6)
30310864	Basic Chemistry Laboratory	1(0-3-1)
30810664	Physics for Health Science	3(3-0-6)
68010164	Medical Biology	3(3-0-6)
68010264	Medical Biology Laboratory	1(0-3-1)
Total credits		21

The first year: semester 2		
Course	Credits (lecture-practice-selfstudy)	
89510064	Wisdom of BUU	3(2-2-5)
89520264	Thinking Process for Understanding Oneself and Others	2(1-2-3)
89520564	Collegiate English	3(2-2-5)
89520764	Thai Language Skills for Communication	2(1-2-3)
89530xxx*	Future Work Competency Development Course	2 credits
89530xxx*	Future Work Competency Development Course	2 credits
30312064	Organic Chemistry	2(2-0-4)
30315465	Fundamentals of Analytical Chemistry	2(2-0-4)
30315565	Fundamentals of Analytical Chemistry Laboratory	1(0-3-1)
XXXXXXXX**	Subject name	2 credits
Total credits		21

* Elective course: Select 2 courses for 4 credits from the Future Work Competency Development Courses

** Free electives

The second year: semester 1		
Course	Credits (lecture-practice-selfstudy)	
89510364	Physical Well-being Management	2(1-2-3)
89510764	Love, Sex and Health	2(1-2-3)
68010364	Basic Human Anatomy	2(2-0-4)
68010464	Basic Human Anatomy Laboratory	1(0-3-1)
68021664	Principle of Human Physiology	2(2-0-4)
68021964	Basic Pathology	2(2-0-4)
68022364	Biochemistry for Allied Health Sciences	2(2-0-4)
68022464	Biochemistry for Allied Health Sciences Laboratory	1(0-3-1)
68222165	Introduction to Microbiology	2(1-3-3)
68227165	Principle Use and Maintenance of Laboratory Instruments	1(0-3-1)
XXXXXXXX**	Subject name	2 credits
Total credits		19

** free electives

The second year: semester 2		
Course	Credits (lecture-practice-selfstudy)	
89530064	Opportunities and Challenges for Future Careers	2(2-0-4)
68023364	Statistics and Biostatistics for Health Sciences	3(3-0-6)
68221165	Basic Immunology	1(1-0-2)
68222465	Clinical Bacteriology	1(1-0-2)
68222565	Clinical Bacteriology Laboratory	1(0-3-1)
68223165	Clinical Chemistry I	3(3-0-6)
68223265	Clinical Chemistry Laboratory I	1(0-3-1)
68224165	Basic Hematology	1(1-0-2)
68224265	Basic Hematology Laboratory	1(0-3-1)
68224365	Clinical Parasitology	2(2-0-4)
68224465	Clinical Parasitology Laboratory	1(0-3-1)
68227265	Human Genetics	1(1-0-2)
68227365	Pharmacology for Medical Technology	1(1-0-2)
XXXXXXXX**	Subject name	2 credits
Total credits		21

** Free electives

The third year: semester 1		
Course	Credits (lecture-practice-selfstudy)	
89539764	Entrepreneurship in the 21st Century	3(0-0-9)
68231165	Clinical Immunology	2(2-0-2)
68231265	Clinical Immunology and Virology Laboratory	1(0-3-1)
68232165	Clinical Microbiology	1(1-0-2)
68232265	Clinical Bacteriology Laboratory	1(0-3-1)
68232365	Clinical Virology	1(1-0-2)
68233165	Clinical Chemistry II	3(3-0-6)
68233265	Clinical Chemistry Laboratory II	1(0-3-1)
68234165	Clinical Hematology I	2(2-0-4)
68234265	Clinical Hematology Laboratory I	1(0-3-1)
68326165	Medical Technology Laboratory Safety	1(1-0-2)
68237165	Techniques in Molecular Biology and Genetic Engineering	2(1-3-3)
Total credits		19

The third year: semester 2		
Course	Credits (lecture-practice-selfstudy)	
68232465	Clinical Mycology	1(1-0-2)
68234365	Clinical Hematology II	2(2-0-4)
68234465	Clinical Hematology Laboratory II	1(0-3-1)
68234565	Urine and Body Fluid Analysis	2(2-0-4)
68234665	Urine and Body Fluid Analysis Laboratory	1(0-3-1)
68235165	Transfusion Science I	2(2-0-4)
68235265	Transfusion Science Laboratory I	1(0-3-1)
68236265	Toxicology and Occupational	2(1-3-3)
68238165	Health Research Methodology	1(1-0-2)
6823XXX	Professional Elective Courses	2 credits
Total credits		15

The fourth year: semester 1		
Course		Credits (lecture-practice-selfstudy)
68245165	Transfusion Science II	2(2-0-4)
68245265	Transfusion Science Laboratory II	1(0-3-1)
68246165	Clinical Correlation	1(1-0-2)
68246265	Quality System and Clinical Laboratory Management	2(2-0-4)
68247165	Professional Law and Ethics	1(1-0-2)
68247265	Health Informatics and its application	2(1-3-3)
68248165	Medical Technology	1(0-2-1)
68248265	Seminar Research Projects	1(0-3-1)
68249165	Community Medicine	2(0-6-2)
68249265	Practical in Medical Technology	1(0-3-1)
68243XX	Specific subjects (elective majors)	2 credits
Total credits		16

The fourth year: semester 2		
Course		Credits (lecture-practice-selfstudy)
68249365	Medical Technology Training	6(0-24-6)
Total credits		6

The teachers in charge of the program

No.	Name-surname	Degree
1	Asst.Prof.Dr. Pornanan Kueakhai	Ph.D. (Pathobiology)
2	Assoc.Prof.Dr. Uraivan Intamaso	Ph.D. (Microbiology)
3	Asst.Prof.Dr. Niramom Thamwiriyasati	Ph.D. (Molecular Genetics and Genetic Engineering)
4	Asst. Prof. Dr. Chirapond Chonanant	Ph.D. (Biomedical Sciences)
5	Dr. Sanita Singsanan	Ph.D. (Biomedical Sciences)
6	Dr. Palatip Chutoam	Ph.D. (Biochemistry)

Program lecturer

No.	Name-surname	Degree
1	Asst.Prof.Dr. Pornanan Kueakhai	Ph.D. (Pathobiology)
2	Assoc.Prof.Dr. Uraivan Intamaso	Ph.D. (Microbiology)
3	Asst.Prof.Dr. Niramom Thamwiriyasati	Ph.D. (Molecular Genetics and Genetic Engineering)
4	Asst.Prof.Dr. Kanokporn Srisucharitpanit	Ph.D. (Molecular Genetics and Genetic Engineering)
5	Asst.Prof.Dr. Natthapaninee Thanomsridetchai	Ph.D. (Biomedical Sciences)
6	Asst. Prof.Dr. Chirapond Chonanant	Ph.D. (Biomedical Sciences)
7	Dr. Sanita Singsanan	Ph.D. (Biomedical Sciences)
8	Dr. Palatip Chutoam	Ph.D. (Biochemistry)
9	Dr. Tistaya Semangoen	Ph.D. (Immunology)
10	Dr. Nattaphol Prakobkaew	Ph.D. (Biomedical Sciences)
11	Dr. Chontida Tangsongcharoen	Ph.D. (Molecular Genetics and Genetic Engineering)
12	Dr. Surachat Buddhisa	Ph.D. (Biomedical Sciences)
13	Dr. Sureerat Padthaisong	Ph.D. (Medical Biochemistry and Molecular Biology)

Teaching Facilities

1. Faculty of Allied Health Sciences, Burapha University
2. Internship facilities, medical laboratory in public and private hospitals such as Chon Buri Hospital, Rajavithi Hospital, Police Hospital, Phramongkutklo Hospital, Pranangklo Hospital, Uthaitani Hospital, Buddhasothorn Hospital, Pakchongnana Hospital, Maharat Nakhon Ratchasima Hospital, Trat Hospital, Singburi Hospital, Angthong Hospital, Rayong Hospital, Sakaeo Crown Prince Hospital, Nakhon Nayok Hospital, Chulabhorn Royal Academy Hospital, etc.

Internship in Medical Technology

Students must attend the internship in medical laboratory for at least 360 hours in the second semester of the fourth-year study. Students must attend the internship in all 5 laboratory sections, including 1) clinical chemistry, 2) clinical hematology, clinical microscopy, and parasitology, 3) clinical microbiology, 4) clinical immunology, and 5) transfusion science. The purpose of the internship is to enable students to apply theoretical and practical knowledge to practice practical work in medical laboratories, apply the theoretical and practical knowledge to interpretation and validation of test results, reporting results and quality assurance in medical laboratories. Students can perform sample collections and medical laboratory practices according to medical technology professional standards, understand the rights of patients and demonstrate ethics in the medical technology profession.

Graduation Requirements

In order to graduate, a student must completely enroll at least 138 credits composing of general education course (30 credits), Required courses (102 credits) and free elective courses (6 credits) with cumulative grade point average (GPAA) at least 2.0, and “pass” English proficiency test according to Burapha University criteria.

Career after graduation

After graduating students in Bachelor of Science (Medical Technology) will be able to register for professional license examination held by The Medical Technology Council. Students can work as:

1. Medical Technologist
2. Entrepreneur of medical laboratories clinics
3. Scientist, Medical scientist, Researcher assistant
4. Medical laboratory instrument practitioners
5. Sales representative, Sales specialist
6. Academic staff
7. Academics assessor in life insurance with health condition