



**Master of Science Program in Medical Technology**  
**Faculty of Associated Medical Sciences, Khon Kaen University**

**1. Course management:**

- 2 academic years

**2. Program Philosophy:**

The Master's program in Medical Technology is committed to producing high quality professional graduates with knowledge and skill. The graduates are able to develop, conduct and apply research to create knowledge in medical technology with standard and also have leadership, ethics and morality.

**3. Qualifications:**

- Plan A1, a Bachelor's degree in a field subject to the approval of the program's Executive Committee with a minimum cumulative grade point average (GPA) of not less than 3.50 and has experience in publishing papers as well as a research proposal for consideration upon an interview.
- Plan A2, a Bachelor's degree in a field subject to the approval of the program's Executive Committee with a minimum cumulative grade point average (GPA) of not less than 2.50.

**4. Program structure:**

The degree has total courses with 36 credits for minimum. It can be divided into two plans:

- **Plane A 1:** Research oriented; it consists of a thesis course with a minimum credit of 36. The program may assign the study of some courses or non-credit courses, but the results should be up to the standard specified by the program.
- **Plan A 2:** Research & coursework; it consists of a thesis course with a minimum credit of 12, and other coursework with a minimum credit of 12. The total credits for the whole program should be 36 credits for minimum.

<b>Program Structure</b>	<b>Credit Number</b>	
	<b>Plan A1</b>	<b>Plan A2</b>
Required Courses	-	12
Elective Courses	-	4
Thesis	36	20

<b>Total</b>	<b>36</b>	<b>36</b>
--------------	-----------	-----------

### 5. Required Courses:

<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
AM 137 501	Modern Cell Biology	3 (3-0-6)
AM 137 502	Clinical Laboratory Result Analysis, Interpretation and Correlation	2 (2-0-4)
AM 137 503	Clinical Laboratory and Quality Management System	2 (2-0-4)
AM 137 504	Assessment of Tests in Medical Diagnostic Laboratory	1 (0-2-1)
AM 137 505	Research Methodology and Biostatistics in Medical Technology	2 (2-0-4)
AM 137 891	Current Topics in Medical Technology I	1 (0-3-2)
AM 137 892	Current Topics in Medical Technology II	1 (0-3-2)

### 6. Elective Courses:

<b>Course Code</b>	<b>Course Title</b>	<b>Credit Hours</b>
AM 137 108	Research in Proteomic, Kinome, Metabolomic and Medical Applications	1 (1-0-2)
AM 137 206	Molecular Genetics of Bacteria	2 (2-0-4)
AM 137 207	Molecular Genetics of Major Histocompatibility Complex Special Problems in Clinical Immunology	2 (2-0-4)
AM 137 504	Assessment of Tests in Medical Diagnostic Laboratory	1 (0-2-1)
AM 137 505	Research Methodology and Biostatistics in Medical Technology	2 (2-0-4)
AM 137 891	Current Topics in Medical Technology I	1 (0-3-2)
AM 137 892	Current Topics in Medical Technology II	1 (0-3-2)

### 7. Thesis:

<b>Course Code</b>	<b>Course Title</b>	<b>Credits</b>
AM 137 898	Thesis	36
AM 137 899	Thesis	20

## 8. Study Plan:

1 <sup>st</sup> Year		First semester	
		Plan A 1	Plan A 2
AM 137 501	Modern Cell Biology	-	3 (3-0-6)
AM 137 503	Clinical Laboratory and Quality Management System	-	2 (2-0-4)
AM 137 504	Assessment of Tests in Medical Diagnostic Laboratory	-	1 (0-2-1)
AM 137 505	Research Methodology and Biostatistics in Medical Technology	-	2 (2-0-4)
AM 137 891	Current Topics in Medical Technology I	-	1 (0-3-2)
AM XXX XXX	Elective	-	2 (x-x-x)
AM 137 898	Thesis	9	-
	<b>Total</b>	<b>9</b>	<b>11</b>
	<b>Total Credit Attempted</b>	<b>9</b>	<b>11</b>

  

1 <sup>st</sup> Year		Second semester	
		Plan A 1	Plan A 2
AM 137 502	Clinical Laboratory Result Analysis, Interpretation	-	2 (2-0-4)
AM 137 892	Current Topics in Medical Technology II	-	1 (0-3-2)
AM XXX XXX	Elective	-	2 (x-x-x)
AM 137 898	Thesis	9	-
AM 137 899	Thesis	-	4
	<b>Total</b>	<b>9</b>	<b>9</b>
	<b>Total Credit Attempted</b>	<b>18</b>	<b>20</b>

  

2 <sup>nd</sup> year		First Semester	
		Plan A 1	Plan A 2
AM 137 898	Thesis	9	-
AM 137 899	Thesis	-	10
	<b>Total</b>	<b>9</b>	<b>10</b>
	<b>Total Credit Attempted</b>	<b>27</b>	<b>30</b>

  

2 <sup>nd</sup> Year		Second Semester	
		Plan A 1	Plan A 2
AM 137 898	Thesis	9	-
AM 137 899	Thesis	-	6
	<b>Total</b>	<b>9</b>	<b>6</b>
	<b>Total Credit Attempted</b>	<b>36</b>	<b>36</b>

---

## 9. Course description

### **AM 137 501 Modern Cell Biology**

**3 (3-0-6)**

Cell structure of prokaryote and eukaryote, DNA: structures, synthesis, metabolism and functions, protein: structures, synthesis, metabolism and functions, carbohydrate and lipid: structures, synthesis, metabolism and functions, gene expression and regulations, intracellular and extracellular traffic, cell cycle and regulations, cell senescence and cell death, signal transduction and signaling pathways, extracellular matrix and its signaling, stem cells: types and lineages, tumor biology, molecular biological techniques, genomics, proteomics and metabolomics, cell culture and animal models

### **AM 137 502 Clinical Laboratory Result Analysis, Interpretation and Correlation 2( 2-0-4)**

Clinical laboratory result analysis and interpretation, correlations between pathogenesis, pathophysiology, and laboratory results, problem-based learning using case studies including self-study, presentations and discussions

### **AM 137 503 Clinical Laboratory and Quality Management System 2 (2-0-4)**

Concepts of total quality management (TQM) in clinical laboratory, customer expectation, evidence based monitoring, standards requirements, quality management system, standards of clinical laboratory, good clinical practice (GCP), guidelines of good clinical laboratory practice (GCLP), professional standards, laboratory quality assurance, methods of validation and verification, quality control, proficiency testing and peer groups, six Sigma and applications, utility management, assessment of benefit, cost effectiveness, environmental management, laboratory information management system (LIMS), document control in clinical laboratory, risk management system, knowledge management and experience sharing with accredited laboratory and case studies

### **AM 137 504 Assessment of Tests in Medical Diagnostic Laboratory**

**1 (0-2-4)**

Types of medical diagnostic tests and assessment of test kit, research design and important points for medical diagnostic laboratory tests, evaluation of test performance in medical diagnostic laboratory tests including validity, reliability, feasibility, clinical outcomes, and selection of the proper test

**AM 137 505 Research Methodology and Biostatistics in Medical Technology**

**2(2-0-4)**

Research process, proposal development, report writing and publication, ethics in human research, ethics in research literature review, information technology, biostatistics in medical technology, data analysis, probability and distribution, sample size and random sampling, descriptive statistics, inferential statistics, hypothesis testing using parametric and non-parametric statistics, variance analysis, correlation and linear regression analysis, quantitative research, statistics for diagnosis

**AM 137 108 Research in Proteomics, Kinome, Metabolomics and Medical Applications**

**1 (1-0-2)**

Principles studies in proteomics, kinome and metabolomics, technologies, and analyses in proteomic, kinomic and metabolomic research and medical applications

**AM 137 891 Current Topics in Medical Technology I**

**1 (0-3-2)**

Self-study, analysis and criticism of current topics in academic and research articles related to medical technology under supervision of an advisor, responsibility, teamwork and presentation in the class

**AM 137 892 Current Topics in Medical Technology II**

**1 (0-3-2)**

Review, analysis, and criticism of current topics in academic articles and related research studies in medical technology under supervision of an advisor, responsibility, teamwork and presentation in English

**AM 137 996 Dissertation**

Conducting experiments or research and prepare dissertation in medical technology or related topics under the supervision and guidance of a supervisor and approved by the advisory committee, publication of research work in peer-reviewed international journal

**AM 137 206 Molecular Genetics of Bacteria**

**2 (2-0-4)**

Molecular genetics of bacteria, chromosome, and its component such as core and accessory genome, extrachromosomal genetic elements including plasmid, mobile genetics elements role of genes and their expression in phenotypic and genotypic properties, application of molecular bacterial genetics in molecular technology research

**AM 137 207 Molecular Genetics of Major Histocompatibility Complex 2 (2-0-4)**

Molecular structure of the major histocompatibility complex (MHC), gene clusters, gene families and gene organization with respect to functional and evolutionary relationships, medical significance of the complex, techniques in analysis of the MHC genes both at the DNA and protein levels, principle of genetic segregation of the MHC genes and approaches to the study of disease associations with the MHC

**Contact Person:**

1. Associate Professor Jureerat Daduang, Ph.D., Curriculum Chair

E-mail address: jurpoo@kku.ac.th

2. Apinya Jusakul, Ph.D., Curriculum Secretary

E-mail address: [apinjus@kku.ac.th](mailto:apinjus@kku.ac.th)

Tel. /Fax: +66 43-202-399

Faculty of Associated Medical Sciences

Khon Kaen University 40002, Thailand

\*\*\*\*\*