



คณะเทคนิคการแพทย์ มหาวิทยาลัยขอนแก่น Faculty of Associated Medical Sciences KKU

Doctor of Philosophy Program in Medical Science

Faculty of Associated Medical Sciences

Khon Kaen University

1. Course management:

- 3 (plan 1.1 and 2.1) or 4 (plan 1.2 and 2.2) academic years

2. Program Philosophy:

The program provides the in-depth knowledge on medical sciences and advanced technologies as well as the opportunity to conduct an ethically advanced research in areas of interests.

3. Qualifications:

Plan 1.1, a Master's degree in a field of sciences or related disciplines including medicine, dentistry, and/or other degree subject to the approval of the program's Executive Committee with a minimum cumulative grade point average (GPA) of not less than 3.50 **or** has experience in publishing papers as well as a research proposal for consideration upon an interview.

Plan 1.2, a Bachelor's degree in a field of sciences or related disciplines including medicine, dentistry, and/or other degree subject to the approval of the program's Executive Committee with a minimum cumulative grade point average (GPA) of not less than 3.50 **or** has experience in publishing papers as well as a research proposal for consideration upon an interview.

Plan 2.1, a Master's degree in a field of sciences or related disciplines including medicine, dentistry, and/or other degree subject to the approval of the program's Executive Committee with a minimum cumulative grade point average (GPA) of not less than 3.25 **and** has experience in publishing papers as well as a research proposal for consideration upon an interview.

Plan 1.2, a Bachelor's degree in a field of sciences or related disciplines including medicine, dentistry, and/or other degree subject to the approval of the program's Executive Committee with a minimum cumulative grade point average (GPA) of not less than 3.50 **or** has experience in publishing papers as well as a research proposal for consideration upon an interview.



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4. Program structure:

Doctor of Philosophy in Medical Technology				
Courses	Plan 1.1	Plan 1.2	Plan 2.1	Plan 2.2
Compulsory Courses	-	-	8	16
Elective Courses	-	-	4	8
Dissertation	48	72	36	48
Total Credits	48	72	48	72

5. Compulsory Courses:

5.1 Compulsory Courses for Plan 2.1 (8 credits)

Course Code	Course Title	Credit Hours
AM 437 712	Research Practicum in Medical Science	2(1-3-4)
*AM 437 501	Critical Appraisal Techniques for Medical Science Research	2(2-0-4)
AM 437 991	Seminar I	1(1-0-3)
AM 437 992	Seminar II	1(1-0-3)
AM 437 993	Seminar III	1(1-0-3)
AM 437 994	Seminar IV	1(1-0-3)

5.2 Compulsory Courses for Plan 2.2 (16 credits)

Course Code	Course Title	Credit Hours
MD 567 712	Cells and Molecular Biology	3(3-0-6)
AM 427 505	Applications of Biochemistry and Molecular Biology in Health & Disease	2(2-0-4)
AM 427 506	Molecular Biology Techniques in Medical Science	3(2-3-4)
AM 437 712	Research Practicum in Medical Science	2(1-3-4)
AM 437 501	Critical Appraisal Techniques for Medical Science Research	2(2-0-4)
AM 437 991	Seminar I	1(1-0-3)
AM 437 992	Seminar II	1(1-0-3)
AM 437 993	Seminar III	1(1-0-3)
AM 437 994	Seminar IV	1(1-0-3)

6. Elective Courses:

Course Code	Course Title	Credit Hours
AM 427 507	Body Systems and Laboratory Assessment	1(1-0-3)
AM 137 206	Molecular Bacterial Genetics	2(2-0-4)
AM 427 101	Molecular Oncology and Cancer Immunology	2(2-0-4)
AM 427 301	Molecular Pathogenesis and Analysis of Thalassemia	2(1-3-4)
AM 427 302	Integration of Laboratory Results for Thalassemia Diagnosis	1(1-0-3)
AM 427 420	Molecular Genetics of Major Histocompatibility Complex	2(2-0-4)
AM 527 191	Special Problems in Clinical Chemistry	2(1-3-4)
AM 527 291	Special Problems in Clinical Microbiology	2(1-3-4)
AM 527 391	Special Problems in Clinical Hematology	2(1-3-4)
AM 527 392	Special Problems in Clinical Microscopy	2(1-3-4)
AM 527 491	Special Problems in Clinical Immunology	2(1-3-4)
BS 957 149	Entrepreneurship Healthcare and Health Sciences in Globalization	2 (2-0-4)

7. Course description

7.1 Compulsory course

AM 427 505 Applications of Biochemistry and Molecular Biology in Health & Disease 2(2-0-2)

Applications of chemistry and metabolism of biomolecules biochemistry and molecular biology of immunohematology, genomics, transcriptomics, metabolomics, proteomics, microbiota and metagenomics, enzymology, endocrinology, nutrition, infectious, non-communicable, genetic diseases and precision medicine

AM427 506 Molecular Biology Techniques in Medical Science 3(2-3-4)

Techniques in molecular biology and applications to the diagnosis of diseases and research study, including gene cloning and expression, DNA amplification, DNA hybridization, DNA sequencing, proteomic analysis, biosensor, antibody production, and molecular techniques for diagnosis of emerging disease

AM437 501 Critical Appraisal Techniques for Medical Science Research 2 (1-3-4)

Principles of critical appraisal (CA), approach and CA tools, practice in appraising various research designs in medical sciences, CA of a study dealing with laboratory experiment, clinical trial, diagnostic test study, descriptive, case-control and cohort studies, evaluating a narrative and systematic reviews

AM437 712 Research Practicum in Medical Science 2 (1-3-4)

Practicum project planning, development of research proposal, data collection, data analysis. manuscript preparation, patent/ petty patent, research ethics and publishing ethics



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AM437 991 Seminar I 1 (1-0-3)

Searching, analyzing and criticizing research articles related to a dissertation topic, presenting in English, developing skills in leadership in seminar activity, being a good listener, discussion in class and team working

AM437 992 Seminar II 1 (1-0-3)

Searching and reviewing literatures related to the dissertation, analyzing and collecting body of knowledge, conceptualizing a framework for further study, presenting the reviewed literatures in English, developing skills in leadership in seminar activity, being a good listener, discussion in class and team working

AM437 993 Seminar III 1 (1-0-3)

Searching and reviewing literatures related to the dissertation, analyzing, and seeking a gap of knowledge for further study, creating a story based on evidence, presenting in English, developing skills in leadership in seminar activity, being a good listener, discussion in class and team working

AM437 994 Seminar IV 1 (1-0-3)

Analysis and synthesis of knowledge from research papers related to dissertation, development of skill in creating a story for giving a talk at an academic forum, writing an abstract and presenting in English, developing skills in leadership in seminar activity, being a good listener, discussion in research forum and team working

MD567 712 Cells and Molecular Biology 3 (3-0-6)

The molecular organization of cells and cellular energy, metabolism, genome, gene regulation, chemical components of cells, structure and function of cells, cell growth and division, cell communication, cell development and differentiation, cell interactions, cell pathology and cell death, molecular and cellular basis of diseases, tumor development, the evolution of cell and the immune system

7.2 Elective Course

AM427 507 Body Systems and Laboratory Profiles 1(1-0-3)

Pathophysiology of the body systems and laboratory assessment, integumentary, cardiovascular, lymphatic, respiratory, digestive, endocrine, urinary, and reproductive systems.

AM137 206 Molecular Bacterial Genetics 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

AM427 101 Molecular Oncology and Cancer Immunology 2 (2-0-4)

Molecular biology of cancer cells, carcinogenesis, cancer genetics and epigenetics, immune responses against tumor, cancer and transformed cells, mechanisms of immune evasion by tumor and cancer cells, cancer diagnosis, prevention and cell/immunotherapy



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AM427 301 Molecular Pathogenesis and Analysis of Thalassemia

2 (1-3-4)

Molecular basis of thalassemia genes, the relationships between thalassemic genes and pathophysiology of diseases, pre- and post-natal laboratory diagnosis of thalassemia, the genotype-phenotype relationship, the thalassemia patient's family study, the prevention and control of thalassemia and the recent advance in management and laboratory diagnosis of the disease

AM427 302 Integration of Laboratory Results for Thalassemia Diagnosis

1 (1-0-3)

National policy and strategy of prevention and control of thalassemia, principle, method, reporting, interpretation, screening, hemoglobin and DNA analyses for diagnosis of thalassemia, evaluation of couple at risk for severe thalassemia disease, prenatal diagnosis, and case study

AM427 420 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

AM 527 191 Special Problems in Clinical Chemistry

2 (1-3-4)

Solving problems in clinical chemistry, analysis, planning, appropriate test or recent techniques selection to deal with the current problems

AM 527 291 Special Problems in Clinical Microbiology

2 (1-3-4)

Problem solving in clinical microbiology, analysis, planning, appropriate tests or recent techniques selection to deal with the current problem

AM527 391 Special Problems in Clinical Hematology

2 (1-3-4)

Solving problems in clinical hematology, analysis, planning, appropriate test or recent techniques selection to deal with the current problems

AMv527 392 Special Problems in Clinical Microscopy

2(1-3-4)

Solving problem in clinical microscopy, analysis, planning, appropriate test or recent techniques selection to deal with the current problems

AMv527 491 Special Problems in Clinical Immunology

2(1-3-4)

Problems solving in clinical immunology including analysis, planning, appropriate test or recent techniques selection to deal with the current problems

BS 957 149 Entrepreneurship Healthcare and Health Sciences in Globalization

2 (2-0-4)

Dynamic health and health science business, analysis, searching business opportunity and strategic planning for health business health science and public health, health insurance, pharmacy, medical instrument, Investment analysis and planning, capital management, to applied technology for management. The introductory laws, standard and ethics for the entrepreneurial health business and health science, case study and project



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7.3 Dissertation

AM437 996 Dissertation 48 credits

Conducting an ethical experiment or a research work to create the new knowledge or improve works related to medical sciences, or integrate research from problems in routine work, reviewing literatures, writing a review article and a research proposal, submitting for ethical approval, writing thesis and manuscript under the supervision and guidance of the supervisor, publish in a standard international journal

AM437 997 Dissertation 72 credits

Conducting an ethical experiment or a research work to synthesize and integrate the knowledge related to medical sciences to create the new knowledge or innovation, reviewing literatures, writing a review article and a research proposal, submitting for ethical approval, writing thesis and manuscript under the supervision and guidance of the supervisor, publish in a standard international journal

AM437 998 Dissertation 36 credits

Conducting an ethical experiment or a research work to create the new knowledge or improve works related to medical sciences, reviewing literatures, writing a research proposal, submitting for ethical approval, writing thesis and manuscript under the supervision and guidance of the supervisor, publish in a standard international journal

AM437 999 Dissertation 48 credits

Conducting an ethical experiment or a research work to create the new knowledge or improve works related to medical sciences, reviewing literatures, writing a review article and a research proposal, submitting for ethical approval, writing thesis and manuscript under the supervision and guidance of the supervisor, publish in a standard international journal

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