

**REGULATIONS FOR THE
POSTGRADUATE CERTIFICATE IN MOLECULAR AND DIAGNOSTIC
PATHOLOGY
(PCMDPath)**

(See also General Regulations)

M135 Admission requirements

To be eligible for admission to the courses leading to the Postgraduate Certificate in Molecular and Diagnostic Pathology, a candidate shall:

- (a) comply with the General Regulations; and
 - (b) hold a Bachelor's degree with honors or a degree of MBBS of this University, or another qualification of equivalent standard from this University, or from another University or comparable institution accepted for this purpose; and
 - (c) satisfy the examiners in a qualifying examination, if required.
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M136 Award of certificate

To be eligible for the award of the Postgraduate Certificate in Molecular and Diagnostic Pathology, a candidate shall

- (a) comply with the General Regulations; and
 - (b) complete the curriculum and satisfy the examiners in accordance with the regulations set out below.
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M137 Length of curriculum

The curriculum shall last for two years on a part-time basis, with 88 hours of prescribed work. The maximum period of study should not exceed four years.

M138 Completion of curriculum

To complete the curriculum, a candidate shall:

- (a) follow instructions in the syllabuses prescribed for the 3-module programme and complete satisfactorily all required written or practical work;
- (b) satisfy the examiners in the course by continuous assessments and by examinations at the end of each module of the teaching programme.

A candidate who fails to fulfil the requirements within the prescribed maximum period of study shall be recommended for discontinuation under the provision of General Regulation G12, except that a candidate who is unable because of illness or circumstances beyond his/her control to complete the requirements within the prescribed maximum period of study, may apply to the Board of Studies for permission to extend his/her period of studies.

M139 Examinations

A candidate who has failed to satisfy the examiners in any part of the examinations may be permitted

- (a) To attend a supplementary examination; or
 - (b) To repeat the course(s) and to re-take the prescribed examination(s).
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M140 Examination results

At the conclusion of the examination, the candidates will be notified of the examination result. A candidate who has shown exceptional merit at the whole examination may be awarded a mark of distinction and this mark shall be recorded in the candidate's transcript.

**SYLLABUSES FOR THE
POSTGRADUATE CERTIFICATE IN MOLECULAR AND DIAGNOSTIC
PATHOLOGY
(PCMDPath)**

PATH6006 and PATH6009 are assessed through coursework assessment (100%) and PATH6008 is assessed through examination (100%). The remaining courses are assessed through examination (60% for Molecular Pathology Modules and 50% for Diagnostic Pathology Modules) and coursework assessment (40% for Molecular Pathology Modules and 50% for Diagnostic Pathology Modules).

PATH6001 Principles and Techniques of Molecular Pathology (24 hours)

This module will cover the following topics: Introduction to molecular pathology and genetics; Principles of electrophoresis and immunoblotting; Principles of automated DNA sequencing and various methods of genotyping and mutation analysis; Human identity by DNA typing; Principles and applications of Quantitative-PCR; Basic concepts in conventional cytogenetics and molecular cytogenetics; In-situ hybridization techniques (ISH, FISH, CISH, SISH); Principles and applications of flow cytometry; Emerging technologies (epigenetics, gene expression profiling, stem cells); Laboratory management issues in molecular testing.

PATH6002 Clinical Applications of Molecular Testing (24 hours)

This module provides an overview of the Principles of HPV testing, its clinical relevance and the various methods of genotyping; Hepatitis B virus infection – testing for viral load and HBV DNA mutants detection; Quantification of EBV DNA plasma for EBV associated diseases; BCR/ABL kinase mutation detection for chronic myelogenous leukaemia and related disorders; KRAS mutation detection for colorectal cancer; EGFR mutation in lung cancer; In-situ hybridization tests: EBER; Kappa/Lambda; HER2 amplification in breast cancer; FISH test for early bladder cancer detection; PCR for gene rearrangements and translocations for haematolymphoid malignancies and soft tissue tumors; RET and Menin gene mutation detection for Multiple endocrine neoplasia syndrome; c-kit mutation detection for gastrointestinal stromal tumors; Gene expression profiling for haematolymphoid malignancies; Laboratory management issues in molecular testing.

PATH6003 Fundamentals of Genetic Testing for Hereditary Disorders (24 hours)

This course provides a comprehensive introduction to Molecular Genetics; Genetic testing for Thalassaemia; Genetic testing for familial colorectal cancer; Genetic testing for familial breast and ovarian cancer; Molecular genetics in Paediatrics; Molecular genetics in Neurological diseases; Laboratory management issues in molecular testing.

PATH6004 Chemical Pathology, Immunology, Diagnostic Haematology and Transfusion Medicine (40 hours)

This module will cover topics on the Renal and Liver function tests; Cardiac Markers; Tumor markers; Clinical Toxicology; Expanded Newborn Screening; Pharmacogenetics, Drug Safety and Personalized Medicine; Biochemical diagnosis of adrenal disorders; Immunochemistry Tests; Autoantibody Tests; Diagnostic Haematology Test; Transfusion Medicine; Laboratory Management.

PATH6005 Essential Anatomical Pathology for Clinicians (40 hours)

Topics include Haematolymphoid malignancies: relevance of classification; Tumors of the respiratory tract and pleural cavity; Tumors of the Central Nervous System; Urologic oncology; Tumors of the breast; Endocrine tumors; Soft tissue and bone tumors; Tumors of the liver and GI tract; Cytological, histopathological and molecular devices for diagnosis and management of gynaecological pathology;

uterine pathology; ovarian tumors and endometriosis; Squamous and glandular lesions of the cervix: cytology and histology; Gestational trophoblastic diseases; Renal biopsy procedure and specimen handling; Interpreting renal biopsies for glomerular, tubular, interstitial and vascular diseases; Classification of lupus nephritis; Banff classification of renal transplant rejection; Glomerular diseases in transplanted kidney; Laboratory management.

PATH6007 Practical Course in Laboratory Methods (24 hours)

This course provides practical sessions on Tissue processing, immunohistochemistry and histological analysis; Basic tissue culture techniques and flow cytometry analysis; Extraction methods for DNA, RNA, protein and electrophoresis; and Reverse transcription, polymerase chain reaction, DNA sequencing.

PATH6008 Molecular Microbiology and Infectious Diseases Update (40 hours)

The Molecular Microbiology component includes the following topics:

Clinical application in bacteriology - Bacterial pathogens: typical and atypical, mycobacterium species, MALDI-TOF-MS technology and application, and Molecular approaches for the diagnosis of sepsis, infections of gastrointestinal tract and central nervous system); Clinical application in virology - Viral pathogens: hepatitis, enteric and respiratory viruses; rapid quantitation of HIV and drug resistance determination; Clinical application in mycology and parasitology - Fungal pathogens, Parasitic pathogens, Limitations and future perspectives of genomic techniques; Clinical applications in epidemiological surveillance and outbreak management - Principles of molecular phylogenetic analysis and molecular typing method, Laboratory and epidemiological considerations for data interpretation and Limitations and future perspectives.

Students are required to attend any of two of the six courses given under the Infectious Disease Update offered by the Department of Microbiology which include the following:

- Infectious disease update and emerging infections
 - Infectious disease emergencies, indwelling device and surgical infections
 - Common problems in infectious diseases
 - Radiology and radionuclide imaging in ID; genitourinary medicine and HIV problems
 - Surprises in daily medical practice: tropical diseases in the developed world
 - Infections in immunocompromised hosts and common infective problems in general practice
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PATH6009 Clinical Applications of Genetic Testing in Inherited Diseases and Genetic Counselling (24 hours)

This course introduces the general principles of cytogenetics, biochemical genetics and molecular genetics in genetic testing and the various laboratory techniques for identification of disease-causing mutations. Through the practical sessions and group discussion, students will learn how to read a laboratory report. Topics will include principles of genetic counselling; ethical and legal aspects; biochemical diagnosis of acute IEM patients; SNP arrays in clinical practice; bioinformatics for mutation reporting; extended newborn screening for metabolic disease; inherited metabolic disease; endocrine disease and neuromuscular disease; neurogenetics and inherited bone disease; pharmacogenetics; constitutional cytogenetics; molecular cytogenetics; next-generation Sequencing – hardware, software and clinical application; practicum: Interpretation of reports; tutorials on inherited cardiac disease, mitochondrial disease, lysosomal storage disease, autistic spectrum disorder. Laboratory visits to genetic laboratories in Hong Kong.
