جامعة الخليج العربي
Arabian Gulf University

MASTER OF SCIENCE IN MOLECULAR MEDICINE

College of Medicine and Medical Sciences (CMMS)| Department of Molecular Medicine, Genetics and Inherited Diseases

Track Credit Hours: 36

1. Programme Overview

The Master of Science in Molecular Medicine is a two-year programme that develops knowledge and skills in cellular and molecular biology, molecular diagnostics, and the molecular mechanisms of disease. It is designed for students with backgrounds in biomedicine, molecular biology, medicine, and related health sciences, and provides research-led teaching with theoretical and practical training in modern molecular and cellular techniques.

The programme offers specialisation in Molecular Genetics, Nanomedicine, and Molecular Immunology. Students complete 28 credit hours of didactic coursework during the first academic year and an 8-credit-hour master thesis during the second academic year, for a total of 36 credit hours.

Graduates are prepared to contribute to research and practical clinical work in areas such as pathological processes, diagnostics, biomarker discovery, molecular mechanisms, and treatment of disease.

2. Study Plan

Course Code	Course Title	Credit Hours
Semester 1 — Core Courses		
CMMS604	Research methodology	2
CMMS621	Inferential statistics and its applications	2
CMMS622	Topics in analytical chemistry	2
CMMSMMM600	Tissue and cell biology	2
CMMSMMM601	Structure, organization, and regulation of human genes	1
CMMSMMM602	PCR and reverse genetics	1
CMMSMMM603	Introduction to nanomedicine	3
Total Credit Hours		**13**
Semester 2 — Specialised Courses		
CMMSPMS605	Genetic testing in genomic era	2

Course Code	Course Title	Credit Hours
CMMSPMS606	Genomics, proteomics, and metabolomics	2
CMMSPMS607	Genomic disorders: phenotype-genotype correlation	2
CMMSMMM604	Inflammation and allergy	3
CMMSMMM605	Cellular and molecular immunology	3
CMMSMMM606	Biological and pharmacological aspects of nanomedicine	3
Total Credit Hours		**15**
Semesters 3–4 — Master Thesis		
CMMSMMM609	Master Thesis	8
Total Credit Hours		**8**
Total Programme Credit Hours		**36**

3. Course Descriptions

CMMS604 — Research methodology (2 CH)

Introduces research design, scientific inquiry, and methodological approaches used in biomedical and molecular medicine research.

CMMS621 — Inferential statistics and its applications (2 CH)

Covers inferential statistical concepts and their application to biomedical data analysis and interpretation.

CMMS622 — Topics in analytical chemistry (2 CH)

Provides selected analytical chemistry topics relevant to laboratory investigation, measurement, and biomedical research applications.

CMMSMMM600 — Tissue and cell biology (2 CH)

Examines tissue organisation and cellular biology as foundations for understanding normal function and disease mechanisms at the molecular level.

CMMSMMM601 — Structure, organization, and regulation of human genes (1 CH)

Introduces human gene structure, organisation, and regulatory mechanisms essential to molecular genetics and disease biology.

CMMSMMM602 — PCR and reverse genetics (1 CH)

Covers polymerase chain reaction and reverse genetics approaches used to investigate gene function and molecular disease mechanisms.

CMMSMMM603 — Introduction to nanomedicine (3 CH)

Introduces nanomedicine and its applications in molecular diagnosis, monitoring, treatment, and biomedical research.

CMMSPMS605 — Genetic testing in genomic era (2 CH)

Explores genetic testing within modern genomic medicine, including applications to diagnosis and inherited disease investigation.

CMMSPMS606 — Genomics, proteomics, and metabolomics (2 CH)

Examines major omics approaches and their use in biomarker discovery, molecular diagnostics, and understanding disease mechanisms.

CMMSPMS607 — Genomic disorders: phenotype-genotype correlation (2 CH)

Addresses genomic disorders through the relationship between genetic variation, phenotype, and disease presentation.

CMMSMMM604 — Inflammation and allergy (3 CH)

Examines inflammatory and allergic processes with emphasis on molecular and immunological mechanisms in health and disease.

CMMSMMM605 — Cellular and molecular immunology (3 CH)

Covers cellular and molecular mechanisms of immune responses and their relevance to disease, diagnostics, and therapeutic development.

CMMSMMM606 — Biological and pharmacological aspects of nanomedicine (3 CH)

Explores biological and pharmacological principles of nanomedicine, including applications in treatment, delivery systems, and molecular-level disease management.

CMMSMMM609 — Master Thesis (8 CH)

The master thesis is completed during the second academic year and focuses on one of the programme's major areas: Molecular Genetics, Nanomedicine, or Molecular Immunology. Students conduct a research project, submit a written thesis, and defend it orally before an examining committee.