

College of Medicine

- **Graduate Diploma in Child Life**
- **Master of Science Child Life**
- **Master of Science in Medical Microbiology**
- **Doctor of Philosophy in Medical Microbiology**
- **Master of Science in Physiology**
- **Doctor of Philosophy in Physiology**
- **Master of Science in Medical Biochemistry**
- **Doctor of Philosophy in Medical Biochemistry**
- **Master of Science in Biomedical Sciences**
- **Master of Science in Pharmacology**
- **Doctor of Philosophy in Medical Sciences Pharmacology**
- **Master of Science in Clinical Nuclear Medicine**
- **Doctor of Philosophy in Clinical Nuclear Medicine**
- **Master of Science in Anatomy**
- **Master of Public Health in Epidemiology**
- **Master of Science in Pathology**
- **Doctor of Philosophy in Pathology**

MEDICINE (FACULTY BASED COURSES)***INTRODUCTION***

All medicine graduate programs may require from their students to study the following Faculty Based Courses. These courses may be considered compulsory for some programs and electives for the others.

0500-503	Research Communication I	(1)
0500-504	Research Communication II	(1)
0520-538	Basic Immunology	(1)
0540-521	Basic Molecular Biology	(1)

COURSE DESCRIPTION**500-503: RESEARCH COMMUNICATION I
CR: 1**

The aim of this course is to improve the student's ability to locate and retrieve information in the library, take effective notes, recognize and manipulate biomedical word roots and affixes of classical origin, write scientific English and communicate effectively in seminars. The course has the following components, which are designated to achieve this aim: Library skills, biomedical terminology, basic information structure, processing and seminar skills.

**0500-504: RESEARCH COMMUNICATION II
CR: 1**

This course has its emphasis on improving the student's ability to collect and organize relevant information, and then communicate that information effectively for research reporting purposes, whether as a written report or a seminar presentation. The timing of the course is contrived to oblige the student to present his thesis background and methods in a seminar.

**0520-538: BASIC IMMUNOLOGY
CR: 1**

Introduction to immunity, Innate and acquired immunity, Organs and cells of the immune system, the Major Histocompatibility Complex and its role in antigen presentation, Humoral immunity, antibodies and complement, Cell-mediated immune function T cells and macrophages, Cytokines and their roles in immune responses, Transplantation immunology, immunoprophylaxis and immunotherapy, Autoimmunity and autoimmune diseases, Hypersensitivity

**0540-521: BASIC MOLECULAR BIOLOGY
CR: 1**

Nucleic acid structure and functions; DNA analysis by agarose gel and DNA sequencing; DNA Replication: Mechanism, Regulation, Differences between prokaryotic and eukaryotic process; DNA damage, repair and mutagenesis, and diseases associated with defective repair; Transcription mechanisms and processing of primary RNA; The genetic code, protein synthesis and regulation; Restriction and modification enzymes and their importance in molecular biology.

MEDICINE (GENERAL COURSES)

INTRODUCTION

All Medical graduate programs require the study of one or more of the following courses offered by the **Department of Community Medicine and Behavioral Sciences**.

0510-501	Biostatistics and Computer in Medicine	(2)
0510-502	Advanced Biostatistics	(1)
0510-503	Epidemiology	(1)
0510-504	Radiotracer Methodology in Biological Research	(2)
0510-601	Biostatistical Method in Medical Research	(3)
0510-602	Epidemiology of Infectious Diseases	(3)

COURSE DESCRIPTION

0510-501: BIostatISTICS AND COMPUTER IN MEDICINE
CR: 2

This is a 2 credit hour faculty-required course intended for students joining the graduate M.Sc. program in the Faculty of Medicine, Kuwait University. The course takes into account the fact that enrolled students belong to various backgrounds and hence it includes a diversity of topics to meet their interest. The course is characterized by the inclusion of statistical methods in epidemiology (relative risk, odds ratio to measure the association between diseases and factors, evaluation of diagnostic tests), determination of size of investigations and power, analysis of variance, and design of controlled randomized clinical trials. It also includes multivariate statistical methods such as multiple linear regression and binary multivariable logistic regression. It focuses on concepts, limitations, validity and assumptions underlying these statistical methods.

The course also provides students with knowledge about hardware and software computer technology in addition to addition to the skills of applying the procedures of the SPSS statistical package, and information about computer uses in medicine

(hospital information system, drug information system and computer-assisted diagnoses).

0510-502: ADVANCED BIostatISTICS
CR: 1

Planning of statistical investigation. Controlled comparative studies: Clinical and simple comparative trials, two period cross over design. Analysis of variance. Experimental design. The control of misclassification error. Survivorship tables and life tables. Biological assays: Parallel-line, slope ratio and quantal response. Non-parametric statistics: One-sample run test, Mann-whitney test, Kruskal-Wallis analysis of variance, and Kendall rank correlation.

0510-503: EPIDEMIOLOGY
CR: 1

Scope of epidemiology, basic measures of frequency, sources of morbidity data, direct and indirect standardization. Planning of an epidemiological investigation, survey planning, variability of measurements, validation and problems in validation, measurement of experimental error, population screening and disease control.

**0510-504: RADIOTRACER METHODOLOGY
IN BIOLOGICAL RESEARCH
CR: 2**

This course provides an introduction to the principles and procedures underlying the use of radioactive isotopes in biological research. The material will be presented at a level requiring only elementary mathematics and the principles and procedures will be illustrated with practical examples drawn from actual laboratory work. The course begins with the materials, and detection and measurement of radiation, and progresses to discussions and illustrations of the applications and problems of radiation measurement and experimental design in biology and medicine and methods used for reduction of radiation exposure. Hazards associated with the use of radioactive material will be discussed. Topics which will be given special emphasis include Gamma and Beta counting of biological samples autoradiography, radiochromatography, use in life science and clinical research, and radiation safety measures.

**0510-601: BIostatistical
METHODS IN MEDICAL
RESEARCH**

CR: 3 PR: 0510-501 or its equivalent.

The course primarily aims at equipping students with tools of research. This includes univariate statistical methods update, sampling methods and sample size, experimental design, multivariate analysis, logistic regression, survival analysis: clinical trials, statistical methods in epidemiology, analysis of matched data and nonparametric statistics. Mann-Whitney, Wilcoxon paired test, Kruskal-Wallis and Spearman rank correlation.

**0510-602: EPIDEMIOLOGY OF
INFECTIOUS DISEASES
CR: 3**

Concepts and definitions, epidemiological models, causality, epidemic process, indices of health and disease, natural history of infectious diseases, contact patterns, measuring infectivity, methods and techniques for studying an infection in the community, time and place clustering, use of routinely collected data, special surveys, surveillance of infectious diseases, field investigation, analysis of an outbreak, seroepidemiology, the effect of bias, confounding and misclassification on the identification of source/reservoir of infection and mode of transmission, statistical techniques often used in infectious disease epidemiology, mathematical models for epidemics, primary and secondary prevention in the infectious disease epidemiology, epidemiology of vaccination, control, elimination and eradication, epidemiology of emerging infections and epidemiology of specific infectious diseases.

Doctor of Philosophy in Physiology
Program code: 053070

INTRODUCTION

The Department of Physiology (Faculty of Medicine) offers a Ph.D. program in Medical **Physiology**. A graduate successfully completing this program will be expected to have an in-depth knowledge in specific areas of Medical Physiology. In addition, he/she should become an independent thinker, planner and executor of specific ideas relevant to Medical Physiology. A major part of the program is the dissertation, which requires high quality research in a specific area of Medical Physiology.

PROGRAM REQUIREMENTS**33 TOTAL COURSE CREDITS****9-12 Course Credits in the major area of specialization (Physiology)**

0530-601	Advanced Seminars in Physiology	I	(1)
0530-602	Advanced Seminars in Physiology	II	(1)
0530-603	Advanced Seminars in Physiology	III	(1)
0530-604	Advanced Seminars in Physiology	IV	(1)
0530-611	Current topics in Physiology	I	(1)
0530-612	Current topics in Physiology	II	(1)
0530-613	Current topics in Physiology	III	(1)
0530-614	Current topics in Physiology	IV	(1)
0530-621	Advanced Readings in Physiology	I	(3)
0530-622	Advanced Readings in Physiology	II	(3)
0530-623	Advanced Readings in Physiology	III	(3)
0530-631	Advanced Techniques in Physiology	I	(3)
0530-632	Advanced Techniques in Physiology	II	(3)
0530-633	Advanced Techniques in Physiology	III	(3)

3-6 Courses available in other Graduate programs

The student may choose an elective course from the following, or from other graduate programs at Kuwait University, or Ph.D programs at other accredited universities related to his/her study, with the approval of the Graduate Program Director.

0510-601	Bio-statistical Methods in Medical Research	(3)
0520-504	Immunity and Infection	(2)
0520-519	Molecular Microbiology	(3)
0520-601	Molecular Techniques and Instrumentation	(3)
0520-604	Advanced Immunology	(3)
0570-506	Immunopathology	(2)

2000-501	Scientific Writing and Communication Skills	(3)
2000-503	Ethics and Professionalism	(2)

18 COMPULSORY COURSES

0530-697	Dissertation	(0)
0530-698	Dissertation	(0)
0530-699	Dissertation	(18)

COURSE DESCRIPTION

(4) FOUR COURSES ON ADVANCED SEMINARS IN PHYSIOLOGY

- 1) 0530-601 CR: 1
- 2) 0530-602 CR: 1
- 3) 0530-603 CR: 1
- 4) 0530-604 CR: 1

The Students will be required to formally present to faculty and peers comprehensive critical reviews on defined themes in specific areas of physiology relevant to the student's interests. The seminars constitute a series of courses progressing from the first up to the fourth semesters of the program as indicated above.

(4) FOUR COURSES ON CURRENT TOPICS IN PHYSIOLOGY

- 1) 0530-611 CR: 1
- 2) 0530-612 CR: 1
- 3) 0530-613 CR: 1
- 4) 0530-614 CR: 1

The students will be required to critically analyze, organize and present to their peers and faculty current research articles in physiology, relevant to the student's interests. This is a series of learning experiences running from the first up to the fourth semester of the program.

(3) THREE ADVANCED READING COURSES IN PHYSIOLOGY

- 1) 0530-621 CR: 3
- 2) 0530-622 CR: 3
- 3) 0530-623 CR: 3

The students will be required to review, under close tutorship by his advisor and co-advisors, to critically analyze, systematize and demonstrate (including lecturing experience) advanced knowledge of classical areas of physiology, relevant to the student's interests. This is a series of

courses progressing from the first up to the third semester of the program.

(3) THREE COURSES ON ADVANCED TECHNIQUES IN PHYSIOLOGY

- 1) 0530-631 CR: 3
- 2) 0530-632 CR: 3
- 3) 0530-633 CR: 3

The students will be required to demonstrate expertise in technical aspects of physiology, relevant to the student's research interests.

A wide variety of quantitative physiological procedures are available to the students ranging from human exercise stress testing, evaluation of respiratory function, cardiac and other organ perfusion, isolated cell preparations, cell culture, electro-physiological techniques such as patch clamping, measurements of intracellular signaling by calcium and cell pH, cell and tissue imaging, isolation and characterization of transport in cell membranes, immunohistochemical and cytochemical techniques, HPLC measurements of neural neurotransmitter, molecular biology techniques such as western blotting, iso-electric focusing, northern blotting and RT PCR are presently available.

The students may take, on agreement with his/her advisory committee, from one to three courses in this series. Upon approval of the advisory committee the students may select some of the advanced techniques relevant to their research interests from graduate programs offered by other departments at Kuwait University or other academic scientific institutions recognized and approved by the CGS of KU.

COLLEGE OF MEDICINE

**0530-697: DISSERTATION
CR: 0**

**0530-698: DISSERTATION
CR: 0**

**0530-699: DISSERTATION
CR: 18**