

EDICINE (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.

0500-501	Basic Molecular Biology	(1)
0510-502	Advanced Biostatistics	(1)
0500-502	Basic Immunology	(1)
0500-503	Research Communication I	(1)
0500-504	Research Communication II	(1)

COURSE DESCRIPTION

0500-501: 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.

0500-502: 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

500-503: RESEARH 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: RESEARH 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 oblique the student to present his thesis background and methods in a seminar.

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 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.

**MASTER OF SCIENCE
BIOMEDICAL SCIENCES
Program code: 0545**

INTRODUCTION

The Faculty of Medicine offers a part-time master program in **Biomedical Sciences**. The aim of this program is to provide top medical students with opportunity for advanced training and to gain research experience in basic medical sciences in parallel with their professional training in order to facilitate their development as physician-scientists. The program only offers thesis option as research requirement.

According to the University Council decision dated 4/2/2007, Thesis students admitted with effect from September 2007 are exempted from the comprehensive examination.

PROGRAM REQUIREMENTS**30 TOTAL COURSE CREDITS****11 COMPULSORY (Credits in parenthesis)**

0500-501	Basic Molecular Biology	(1)
0510-502	Advanced Biostatistics	(1)
0530-535	Integrative Physiology	(2)
0540-501	Biochemistry of Cell Organelles	(2)
0540-563	Metabolic Homeostasis and Abnormalities	(3)
0550-505	Molecular Pharmacology	(2)

10 ELECTIVES (Credits in parenthesis)

0530-521	Experimental Physiology*	(1)
0530-532	Selected Topics in Cellular Physiology	(1)
0530-534	Selected Topics in Pathophysiology	(1)
0530-552	Fluids, Electrolytes and Acid Base Physiology	(3)
0530-571	Selected Topics in Physiology 1	(1)
0540-560	Biochemical Techniques I*	(3)
0540-561	Biochemical Techniques II*	(3)
0540-564	Biochemistry of Diseases	(3)
0540-565	Hormone Biochemistry	(2)
0540-567	Membrane Biochemistry and Biophysics	(2)
0550-504	Experimental Techniques in Pharmacology*	(3)
0550-519	Advanced Topics in Pharmacology 1	(3)
0560-506	Tissue and Organ Histology	(2)
0560-523	Seminars in Advanced Cell Biology	(1)
0570-502	Basic Laboratory Medicine*	(4)

0570-506	Immuno-Pathology	(2)
0545-526	Advanced Microscopical Methods*	(2)
0545-527	Research in Neuroscience	(2)
0545-528	Tissue Culture*	(2)
0545-529	Ultrastructure and Surface Morphology	(2)

*At least one of the electives has to be completed (according to the student's research interest and area of research).

9 COMPULSORY

0545-597	Thesis	(0)
0545-598	Thesis	(0)
2000-599	Thesis	(9)

COURSE DESCRIPTION

0545-526: ADVANCED MICROSCOPICAL METHODS

CR: 2

Theoretical background and practical experience in a variety of microscopical techniques commonly used in studying cell biology. Advances made in microscopical techniques will be covered with emphasis on the advantages and limitations of each technique. The use of microscopy in characterizing normal cells and tissues will be examined. A variety of topics will be covered including: light microscopy, histochemistry, immunohistochemistry, fluorescence microscopy, confocal microscopy, in situ hybridization, radioautography and morphometry.

0545-527: RESEARCH IN NEUROSCIENCE

CR: 2

Areas in up-to-date neuroscience research with specific emphasis on anatomical approaches. The course will discuss latest advances and techniques in several major research topics in neuroscience such as:

- Neuronal degeneration and regeneration (Plasticity)
- Glial cells – functions and role
- Peripheral neuropathy
- Pain transmission and modulation
- Role of neurotransmitters in the brain-in health and disease
- Cell migration and axon guidance

In this course, students are expected to search for specific topics, collect recent publication and present written reports. Students are required to rotate among the faculties' laboratories which are engaged in neuroscience projects to learn more about recent technical advances being used in this field. Students will thus become acquainted with the major theories, research and advances in neuroscience. Teaching sessions will include lectures, discussions and lab rotations.

0545-528: TISSUE CULTURE

CR: 2

Learn the principle of tissue culture and how to isolate, culture, and maintain different cells of the nervous system. The use of tissue culture approach to study the nervous system attempts to reduce the cellular complexity to various extents and to characterize the influence of extrinsic molecules on the cell population under study. The course will be given as one lecture (1 h) and one lab. (3 h) every week. The student may have to spend more time in the lab to feed and take care of the culture.

**0545-529: ULTRASTRUCTURE AND SURFACE
MORPHOLOGY**
CR: 2

Basic techniques of transmission and scanning electron microscopy will be studied theoretically and applied practically by the students. Topics presented include all the necessary knowledge to prepare biological specimens and evaluate their ultrastructure and surface morphology. In addition, information on some special EM methods and recent developments in this field is given in lectures.

0545-597: THESIS
CR: 0

0545-598: THESIS
CR: 0

2000-599: THESIS
CR: 9