Program of Medical Laboratory Sciences

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This program is run in coordination with the Department of Pathology and Laboratory Medicine in the Faculty of Medicine.

The MLS program is designed to prepare students for a career in the profession of medical laboratory sciences by acquiring theoretical knowledge and practical skills in various disciplines of the specialty. Besides presenting theoretical knowledge, the program is dedicated to training students in the reliable performance of physical, chemical, and biological tests by utilizing routine and automated techniques. In addition, students are trained to develop the ability to interpret generated laboratory results and hence contribute to the diagnosis of disease. Continuing one’s education, and updating skills and knowledge, as well as medical professional ethics, are emphasized.

MLSP 201  Clinical Hematology I  3.0; 3 cr.
A course that introduces students to fundamental concepts in hematology, including the development of blood cell elements, normal physiology of blood cells, and their disorders. This course focuses on anemia, with a special emphasis on diagnosis. First semester.

MLSP 202  Clinical Hematology II  3.0; 3 cr.
A course that consists of lectures and demonstrations in hematology with emphasis on coagulation and hemostatic disorders, white blood cell anomalies, and leukemia. Second semester.

MLSP 203  General Microbiology  2.2; 3 cr.
A course that covers structure and morphology of micro-organisms, nutritional requirements and growth, sterilization and disinfection, introduction to microbial genetics, collection and handling of clinical specimens, culture techniques for clinical specimens and expected pathogens, antibiotic sensitivity testing, and assay. First semester.

MLSP 204  Systematic Bacteriology  2.4; 4 cr.
A course that covers the characteristics of bacteria of medical importance with concentration on the diseases they cause, pathogenesis, mode of transmission, control and methods for isolation, identification, and interpretation of results. Second semester.

MLSP 207  Immunology and Blood Banking  2.0; 2 cr.
A course that consists of lectures in basic immunology, including types of immune responses, cells of the immune response, antigens, antibodies, and complement system, as well as basic principles in blood banking and transfusion medicine. First semester.
MLSP 208  General and Diagnostic Virology  2.0; 2 cr.
An introduction to virology covering the general characteristics of viruses, their classification, mode of transmission, pathogenesis, and the diseases they cause in man, is the focus of the first part of this course. The second part emphasizes viral diseases of public health importance, including their epidemiology, control, and possible prevention. First semester.

MLSP 211  Seminar  1.0; 1 cr.
A seminar in which students are trained to read recently published scientific papers in medical journals, summarize, and present the information. This process also involves discussion and critiques of the presented manuscripts. Second semester.

MLSP 259  Diagnostic Serology  1.0; 1 cr.
An introduction to the principles of serologic reactions and laboratory techniques in the diagnosis of infectious diseases. Second semester.

Below are descriptions of the required courses offered by several departments at the Faculty of Medicine: Biochemistry, Microbiology and Immunology, Pathology and Laboratory Medicine, and Physiology.

BIOC 255  Biochemistry for MLSP  3.0; 3 cr.
The course provides an overview of structure, function, and metabolism of basic biological micro/macro molecules; a general review of the genetic makeup; and emphasizes the clinical relevance by correlating disease to basic information. The course is an introductory biochemistry course, offered to undergraduate students in the Medical Lab Sciences Program and related fields. Second semester.

LABM 201/202  Clinical Chemistry I and II  2.0/3.0; 2 /3 cr.
A pair of courses in which the main objective is to acquaint students with fundamentals of clinical chemistry, including various analytical procedures, instrumentation, and methods used for determination of clinical analytes. Correlation of laboratory results with clinical manifestation is also an integral part of these courses. These two courses cover all aspects of routine clinical chemistry testing, such as carbohydrates, electrolytes, acid-base balance, blood gases, nitrogen metabolites, proteins, enzymes, lipids and lipoproteins, calcium metabolism, liver function tests as well as some advanced topics (hormones, therapeutic drug monitoring, toxicology) and specialized techniques like chromatography (HPLC and GC/Ms). First and second semester respectively.

LABM 210  Cytology and Histological Techniques  2.0; 2 cr.
A course that includes a series of lectures and demonstrations on cell biology, a review of normal histology of various human organs, a description of examples of pathological changes, lectures on techniques of tissue handling, and preparation and staining of sections and smears for cytological material. Members of the department and the department of Human Morphology.

LABM 220  Clinical Chemistry and Endocrinology  0.20; 4 cr.
Practical experience in clinical chemistry and endocrinology. Eight weeks.

LABM 230  Clinical Hematology and Reception  4.20; 4 cr.
Practical experience in clinical hematology special procedures and reception area. Prerequisites: MLSP 201 and MLSP 202.
LABM 231  
**Clinical Laboratory Quality Systems**  
1.0; 1 cr.  
This course is intended to give MLS students a thorough understanding of the quality systems as implemented in clinical laboratories with practical examples in order to relate theory to practice. The course includes all the basic elements and tools required to implement the quality system essentials across all phases of the laboratory workflow: pre-analytical, analytical, post-analytical.

LABM 233  
**Genetics and Molecular Biology**  
2.0; 2 cr.  
A course that includes an introduction to human genetics, comprising the structure and function of DNA and the classification of genetic disorders. Diagnostic techniques in human genetics (cytogenetics, biochemical, and molecular) will be covered, as well as molecular techniques applied in pathology and microbiology.

LABM 235  
**Medical Mycology**  
1.0; 1 cr.  
A course that covers the different kinds and types of fungi (yeast and mold). This course discusses their disease spectrum mode of infection, gross requirements, and cultural and non-cultural methods of identifications as well as antifungal drugs and susceptibility testing of fungi.

LABM 240  
**Clinical Microbiology**  
3.2; 4 cr.  
Practical experience in clinical microbiology (aerobic and anaerobic bacteriology, mycobacteriology, mycology, and susceptibility testing). *Eight weeks. Prerequisites: MLSP 203 and MLSP 204.*

LABM 250  
**Clinical Parasitology and Urinalysis**  
1.5.20; 2 cr.  
Practical experience in clinical microscopy pertaining to parasitology, urinalysis, and spermogram. *Four weeks. Prerequisite: MBIM 223.*

LABM 260  
**Serology**  
1.5.20; 2 cr.  
Practical experience in clinical immunology and serodiagnostic techniques. *Four weeks. Prerequisite: MLSP 259.*

LABM 270  
**Blood Banking**  
1.5.20; 2 cr.  
Practical experience in blood banking and transfusion medicine. *Four weeks. Prerequisite: MLSP 207.*

LABM 280  
**Cytogenetics, Molecular Diagnostics and Histotechniques**  
0.20; 2 cr.  
Practical experience in reception, cytogenetics, and histotechniques. *Four weeks. Prerequisite: LABM 210.*

MBIM 223  
**Parasitology for MLS Students**  
2.2; 4 cr.  
A diagnostic parasitology four credit course offered to MLSP junior students in spring semester of each academic year. The purpose of the course is to provide the basic principles and concepts of parasitic diseases and their laboratory diagnosis. Emphasis is placed on life cycles, pathogenesis, preventive measures and in-depth laboratory identification of the parasites. *Second semester.*

PHYL 246  
**Physiology for Nursing Degree Students and Undergraduates**  
4.0; 4 cr.  
A course that outlines fundamental principles of human physiology and the mechanisms governing the function of different body organs. *Prerequisite: BIOC 246 or BIOL 201. Annually.*
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| Lab (3+1+5)       | BIOL 201(4) | CHEM 209(2) | EPHD 203(3) | MLSP 203(3), MLSP 204(4), MBIM 223(4) |
|                   |             |             |             |               |

| Seminar (1)       | MLSP 211(1) |
|                   |             |

| Practical Training (20) | LABM 220(4), 230(4), 240(4), 250(2), 260(2), 270(2), 280(2) |