

Medical Laboratory Sciences

* Master Degree (M.Sc):

- Courses:

Course Requirements for M.Sc. Program in Medical Laboratory Sciences

DEPARTMENTAL COURSES MAKE UP 25 CREDIT HOURS OF THE TOTAL 29 CREDIT HOURS (86%)

Course No.	Title	Credit Hours
CLS 511	Diagnostic Microbiology I	2+1 = 3
CLS 512	(Bacteriology and Virology) Diagnostic Microbiology II	3+1 = 4
CLS 513	(Immunology, Mycology & Parasitology) Advanced Diagnostic Microbiology	2+1 = 3
CLS 514	Antimicrobial Agents	1+1 = 2
CLS 522	General Pathology	1+1 = 2
CLS 531	Advanced Methods of Biochemistry Analysis	2+1 = 3
CLS 532	Advanced Diagnostic Med. Biochemistry	2+0 = 2
CLS 533	Inborn Errors of Metabolism	3+0 = 3
CLS 534	Biochemical Endocrinology	2+0 = 2
CLS 535	Medical Metabolism	2+0 = 2
CLS 541	Advanced Medical Haematology	1+1 = 2
CLS 542	Advanced Immunohaematology	1+1 = 2
CLS 543	Specialized Medical Haematology I	2+1 = 3
CLS 544	Specialized Medical Haematology II	1+1 = 2
CLS 591	Seminar	1+0 = 1
CLS 595	Scientific Writing	

- Courses Distributed by Levels:

1st Semester

Code & No.	Course Title	# of hours
CLS 511	Diagnostic Microbiology I (Bacteriology & Virology)	2 + 1 = 3
CLS 531	Advanced Methods of Biochemical Analysis	2 + 1 = 3
CLS 541	Advanced Medical Haematology	1 + 1 = 2
CLS 422	General Pathology	1 + 1 = 2
	Total	10

2nd Semester

Code & No.	Course Title	# of hours
CLS 512	Diagnostic Microbiology II Immuno- logy, Mycology, and Parasitology	3 + 1 = 4
CLS 532	Advanced Diagnostic Medical Biochemistry	2 + 0 = 2
CLS 542	Advanced Immunohaematology	1 + 1 = 2
CLS 595	Scientific Writing	1 + 0 = 1
	Total	9

3rd Semester

Microbiology A

Code & No.	Course Title	# of hours
CLS 513	Advanced Diagnostic Microbiology	2+1 = 3
CLS 514	Antimicrobial Agents	1+1 = 2
	Total	5

OR Biochemistry B

Code & No.	Course Title	# of hours
CLS 533	Inborn Errors of Metabolism	3+0 = 3
CLS 534	Biochemical Endocrinology or	2+0 = 2
CLS 535	Mineral Metabolism	2+0 = 2
	Total:	5

OR Haematology C

Code & No.	Course Title	# of hours
CLS 533	Specialised Medical Haem. I	3+0 = 3
CLS 534	Specialised Medical Haem. II	2+0 = 2
	Total:	5

In addition to A or B or C, these common subjects are to be taken

Code & No.	Course Title	# of hours
CLS 591	Seminar	1+0 = 1
STAT 575	Statistics	2+0 = 2
BMT 227	Introduction to Personal Computing	1+1 = 1
	Total:	5

Total Credit Hours in 3rd Semester - 10 Credit Hours

4th Semester

Research Thesis

- Master Degree Courses Description:

CLS 511 Diagnostic Microbiology - I (2+1=3)

(Bacteriology and Virology)

In this course, the theoretical and practical topics will deal with microbial physiology and structure, pathogenesis (virulence factors), brief clinical syndromes, detailed laboratory diagnosis (microscopy, culture, serology, and identification), chemotherapy, prevention and control.

CLS 512 Diagnostic Microbiology - II (3+1=4)

(Immunology, Mycology & Parasitology)

The first part of this course (which will parallel Diagnostic Microbiology-I) will deal with the theoretical and practical aspects of different immunological principles, assays, and methods with special emphasis on their specific applications in the identification of infectious agents. The second part of this course will deal with various theoretical and practical aspects of fungi including yeasts (aetiologic-agents of superficial-cutaneous-subcutaneous, systemic, and opportunistic mycoses) and common human parasites of protozoa, flatworms (cestodes & trematodes), and round worms (nematoda), encountered in different clinical specimens.

CLS 513 Advanced Diagnostic Microbiology (2+1=3)

This course is primarily based on up-dated scientific publications that describe the most sophisticated techniques used for rapid, yet, specific diagnosis of life threatening infectious agents. The course will also include lectures in safety measures in the laboratory as well as quality assurance.

CLS 514 Antimicrobial Agents (1+1=2)

This course will deal with the theoretical and practical aspects of methods of antibiotic-susceptibility testing including those for anaerobes, fungi and viruses, drug-resistance, testing antimicrobial-interactions, their levels in serum and other body fluids, their toxicity, and rationals for adopting an antibiotic-policy. Control of micro-organisms in a microbiology laboratory environment with regard to various antiseptics, disinfectants methods of sterilization and aseptic techniques will be taught.

CLS 532 Advanced Diagnostic Medical Biochem. (2+0=2)

The course is designed to discuss concepts in clinical biochemistry to cover physiology, analytical procedures and clinical correlations of analytes and organ systems. Other areas that are expected to serve a larger and more significant role in the future would include tumor markers, chemical assessment of coagulation, therapeutic drug monitoring and future directions in practice of clinical chemistry.

CLS 533 Inborn Errors of Metabolism (3+0=3)

The course is intended to make the student familiar with general concepts about inborn errors of metabolism. It will cover major disorders of carbohydrate and amino acid metabolism in its biochemical, clinical and diagnostic aspects to include Diabetes mellitus, Pentosuria, Essential fructosuria and Hereditary fructose intolerance, Glycogen storage diseases, Disorders of galactose metabolism, Phenylketonuria, Tyrosinemia, Alkaptonuria, Urea cycle disorders, abnormalities of branched chain amino acid metabolism, and Disorders of propionate, methylmalonate and vitamin B12 metabolism.

CLS 534 Biochemical Endocrinology (2+0=2)

A course in biochemical endocrinology will be offered as selected topics in clinical biochemistry to give the student an appreciation of cellular events of hormonal regulation in health and disease. It will include chemical nature and structural diversity of the hormones, hormone function and coordination of biological activity, molecular aspects of hormone action in chronological order i.e. hormone receptor interactions, second messenger generation, gene induction and post-transcriptional control. It will also cover the biochemical basis of endocrinopathies.

CLS 535 Mineral Metabolism (2+0=2)

The course will discuss mineral metabolism and the effects on cellular processes with special emphasis on calcium and inorganic phosphate, regulatory factors, mechanisms regulating their homeostasis, diseases involving homeostasis and the analytical methods.

CLS 541 Advanced Medical Haematology (1+1=2)

In this course, the student will learn the cell of organs, the site and developmental stages of Haemopoiesis. The student will learn the requirements for normal Haemopoiesis and the pathological consequences of deficiencies of these requirements. The student will be familiar with other abnormal haematological conditions, laboratory investigations including morphological and cytochemical changes with a view to proper interpretations of such tests.

CLS 542 Advanced Immunohaematology (1+1=2)

In this course the student will be familiar with the basic and specialized techniques and principles related to blood transfusion, coagulation and fibrinolysis. Students will be familiar with and learn through the investigations of incompatible blood and blood products transfusion as well as laboratory investigations of coagulopathies and pathological fibrinolysis. Safety techniques in the production of blood and blood products will be taught. Mention will be made of management modalities of some hereditary and acquired bleeding problems.

CLS 543 Specialized Medical Haematology I (2+1=3)

This course will cover haematological laboratory diagnostic tests of major haematological malignant diseases including Acute and Chronic leukaemias, malignant lymphomas, Myeloproliferative and lymphoproliferative disorders including multiple Myeloma (MM) and Myelodysplastic Syndrome (MDS). Emphasis will be placed on both basic and more sophisticated haematological diagnostic laboratory tests including cytochemical stains, receptor profile, specific leukaemic antigen detection, monoclonal antibodies testing, cytogenetics and other immunogenotyping methods.

CLS 544 Specialised Medical Haematology II (1+1=2)

This course will cover the basic molecular abnormalities of inheritance and the normal and abnormal structures and functions of variant haemoglobins specifically sickle cell diseases, the thalassaemias, and other haemoglobinopathies. Abnormalities of red cell enzymes, specifically G6PD enzyme and pyruvate kinase enzyme deficiencies will be highlighted. Mention will be made of Hexokinases and Glutathione reductase enzymes. Emphasis will also be laid on diagnostic criteria including the basic haematological diagnosis and more specific and more modern diagnostic tests including Haemoglobin Electrophoresis, Haemoglobin peptide digestion and chain analysis, Haplotype determination, and enzyme electrophoresis and assay.

CLS 591 Seminar (1+0=1)

These courses will prepare a graduate student in use library and related facility in obtaining the relevant information to his research, organize and present the subject matter before scientific audience in preparation for his thesis defense.

CLS 595 Scientific Writing (1+1=2)

A course in scientific writing will be offered on the clarity of concepts in presenting a scientific material at an acceptable level in the form of thesis/dissertation, a manuscript or a research proposal.