Mansoura University
Faculty of Medicine
Clinical Pathology Department

LOG BOOK

For Postgraduate Students
Applying for Doctor Degree in Clinical Pathology

Updated Version

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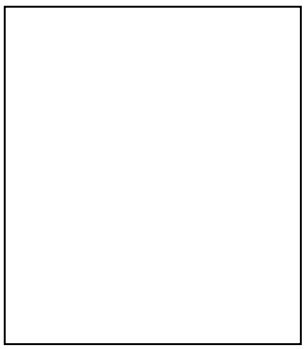
Personal Data



- Name:

- Telephone:

- E. mail address:

- Date of graduation:

- Degree:

- Date of registration:

- Date of Thesis approval:

- Starting Date:

Signature:

Head of the Department **Vice Dean for research and postgraduate study**

Policy of the log Book

Introduction:

According to the new postgraduate study regulation, postgraduate students applying for Master Degree in Clinical Pathology should fulfill a number of credit hours to be awarded. This is performed through attendance of scientific lectures, practical sessions as well as scientific activities including, thesis discussion, conferences and workshops in different specialties of Clinical Pathology. A ending at least 70% of differen activities is a necessary requirement to get the permission to join the final degree exam.

Sections of the log book:

I-First part courses

II- Second part compulsory courses

III- Second part elective courses

IV- Scientific activities

V- Thesis

VI- Appendix

Assessment of the log book

Student's attendance and performance will be assessed by supervisors in different specialties of clinical pathology. Every activity or assessment should be documented by writing. The examination committee will revise the log book at the end of training before the final exam

I-First Part Course

Title of the course: Basics of Clinical Pathology

Course code: CPATH 630 BCP

Credit hours: 5

Teaching hours: 75

Scientific Lectures (Hematology)

Date	Title	Supervisor's signature
	The structure of the marrow and the hematopoi microenvironment	
	The lymphoid tissues	
	Hematopoietic stem cells.	
	Erythropoiesis	
	Granulopoiesis	
	Lymphopoiesis	
	Thrombopoiesis	
	Red cell structure and metabolism	
	Globin gene expression	
	Hemoglobin structure-function relationship	
	Iron homeostasis: Molecular control	
	Phagocytes	
	Physiology of hemostasis	
	Cell cycle regulation and apoptosis	
	Cellular signal transduction pathways	
	Principles of immunohematology	
	Quality assurance in hematology laboratory	
	Genetic principles and molecular biology	
	Cluster of differentiation antigens	
	Organization and management of Hematology laboratory	
	Automation in Hematology Laboratory	
	Hematology in under-resourced laboratories	

Scientific Lectures (Clinical Chemistry)

Date	Title	Supervisor's signature
	General lab. Supplies: ***Lab. Glass ware*** ***Types*** ***Cleaning*** ***Lab. plastic ware*** ***Types*** ***Cleaning*** ***Volumetric equipments*** ***- Pipettes (Method of calibration)*** ***- Volumetric flasks*** ***- Graduated cylinder***	
	Laboratory operations ***- Counting actions (Types /operation and maintenance)*** ***- weighing (Types / operation and maintenance)***	
	Calculation in clinical chemistry - ***Preparation of solution*** - ***Dilution of concentrated solutions*** - ***Percent concentrations*** - ***Normal and Molar solutions***	
	Specimen collection and handling - ***-Collection*** - ***-Types of samples*** - ***-Preservation and transport*** - ***-Separation and storage***	
	Saliva an alternative to laboratory samples	
	Basic lab. Skills - ***Units*** - ***Centrifuges*** - ***Balances*** - ***Water*** - ***Chemicals*** - ***Reagent preparations*** - ***Desiccants*** - ***Mixers and homogenizers*** - ***Pipettes***	
	Spectrophotomety ***- Types*** ***- Components***	

	- Performance and standardization	
	Nephlometry and turbidmetry: ***Principles and applications***	
	Fluorometry. ***- Principles and applications***	
	Electrophoresis ***-Types*** ***- Factor affecting performance & results*** ***-Technical considerations,*** ***- Staining & clinical applications.*** ***- Scanning***	
	Chemiluminescence ***Prilnciples and applications***	
	Osmometry ***- Types*** ***- Clinical significance***	
	Electrochemical techniques ***- Potentiometry types of electrodes*** ***- Amperometry principles and application (ISE)*** ***- Biosensores***	
	Chromatography ***- Types*** ***- Mechanism of separation*** ***- HPLC & GC/MS*** ***- Precautions***	
	Qualitative (imunoelectrophoresis, gel diffusion) - ***Qualitative*** - ***RID*** - ***Labeled assays (RIA, EIA)***	
	Nanotechnology	
	Automation & dry chemistry - ***Selection of an automated instrument***	
	Point of care testing& Panic values	
	Q.C for Selection and evaluation of methods	
	Quality management - ***Control sample*** - ***Calibrator*** - ***Standard*** - ***Types of Q.C*** - ***Charts used for Q.C study e.g. L.J chart, Westgard roles…..etc*** - ***Six sigma*** - ***SDI*** - ***Recovery and interferences*** - ***Accuracy and precision*** - ***Yes or no decision for laboratory run***	

	Reference interval theory - ***Basis*** - ***Use*** - ***Calculations*** - ***Precautions during interpretation*** - ***Normal range Vs reference interval***	
	Screening tests - ***Value*** - ***Uses*** - ***Disadvantages and how to overcome***	
	Types & sources of error - ***Technical*** - ***Clerical***	
	Body fluids methods of assay and evaluations	
	Molecular techniques in clinical chemistry, e.g. PCR, FISH,….. ***Proteomics.***	

Scientific Lectures (Clinical Microbiology)

Date	Title	Supervisor's signature
	Classification of microbes	
	Specimen collection and processing	
	Isolating media, tissue culture and media preparation	
	Quality control in clinical microbiology and biohazards	
	Automation and computer in clinical microbiology	
	Identification techniques and Stains in microbiology	
	Basics in diagnostic virology , Mycology , Non conventional pathogen	
	Phenotypic and genotypic testing of micro-organisms	
	Antimicrobials : Principle of action & antimicrobial policy and resistance	
	Microbial evolution	
	Guidelines for hospital acquired infections	
	Basic immune response to microorganism	
	Sterilization And disinfection	
	Quantification in microbiology	

Scientific Lectures (Clinical Immunology)

Date	Title	Supervisor's signature
	Immune response	
	Innate immunity & toll like receptors	
	B lymphocytes & Ig structure & diversity	
	T lymphocyte & TCR diversity & T reg	
	Complement system	
	MHC & Ag processing	
	NK cells & KIRs	
	Cytokines & chemokines	
	Tolerance & Autoimmunity	
	Molecular cell biology	
	Tests for immune competence	

II- Second Part Compulsory Courses

1- Hematology

Title of the course: Hematology

Course code: CPATH 630 HE

CPATH 630 HEP

Credit hours:

CPATH 630 HE: 8 hours

CPATH 630 HEP: 4 hours

Teaching hours:

CPATH 630 HE: 120 hours

CPATH 630 HEP: 120 hours

SCIENTIFIC LECTURES

Date	Title	Supervisor's signature
	General aspects of anemia	
	Iron-deficiency anemia	
	Iron refractory iron deficiency anemia	
	Iron overload	
	Anemia of chronic disease	
	Sideroblastic anemia	
	Hematological aspects of porphyria	
	Phenotype diversity of thalassemia and sickle cell anemia	
	Pre-implantation and prenatal diagnosis of thalassemia syndrome	
	Molecular techniques used in diagnosis of thalssemia syndrome	
	Molecular basis of thalassemia	
	Macrocytic anemias	
	General aspects of hemolytic anemias	
	Red cell membranopathies	
	Red cell enzymopathies	
	Hemoglobinopathies	

	Immune hemolytic anemias	
	Non-immune hemolytic anemias	
	Paroxysmal nocturnal hemoglobinuria	
	Microangiopathic hemolytic anemias	
	Aplastic anemia and Pure red cell aplasia	
	Congenital dyserthropoietic anemias	
	Pancytopenia	
	Stem cell transplantation	
	Benign disorders of granulocytes	
	Benign disorders of lymphocytes	
	Mononucleosis syndrome	
	Benign disorders of monocytes	
	Disorders of macrophages	
	Hypersplenism and hyposplenism	
	Oncogenesis	
	Cancer stem cell	
	Cytogenetics of hematological malignancies	
	Molecular genetics of hematological malignancies	
	Acute lymphoblastic leukemia	
	Acute myeloid leukemia	
	Myelodysplasia	
	Chronic myeloid leukemia	
	Polycythemia	
	Myelofibrosis	
	Primary thrombocythemia	

	Chronic lymphocytic leukemias	
	Hodgkin`s lymphoma	
	Non Hodgkin`s lymphoma	
	Multiple myeloma	
	Essential monoclonal gammopathy	
	Macroglobulinemia	
	Heavy chain disease	
	Free immunoglobulin light chain	
	Amyloidosis	
	Angiogenesis	
	Vascular purpuras	
	Thrombocytopenia	
	Thrombocytosis	
	Hereditary qualitative platelet disorders	
	Acquired qualitative platelet disorders	
	Hemophilias	
	Molecular genetics of hemophilia	
	vonWillebrand's disease	
	Acquired coagulopathies	
	Circulating inhibitors of coagulation	
	Hereditary thrombophilia	
	Molecular genetics of thrombophilia	
	Acquired thrombophilia	
	Antiphospholipid syndrome	
	Thrombotic microangiopathies	

	Antithrombotic therapy	
	Red cell antigens and antibodies	
	Leukocytes and platelet antigen and antibodies	
	Blood components therapy	
	Complications of blood transfusion	
	Autologous blood transfusion	
	Hematologic aspects of systemic diseases	
	Therapeutic apharesis	
	Blood alternatives	
	Hematology in pregnancy	
	Neonatal hematology	
	Geriatric hematology	

II- Practical Sessions

Skill	Level of performance			Trainee's assessment			Trainer's signature
	Observation	Assistance	Independence	Poor	Fair	Good	
Collection and handling of blood samples							
Tests for acute phase response ***ESR*** ***Plasma Viscosity*** ***Whole blood viscosity***							
Hemoglobinometry							
Manual red cell count reticulocyte count , hematocrit and calculation of red cell indices							
Manual p Manual total and differential count latelet count,							
Automated blood count							
Preparation and staining methods of blood and bone marrow films							
Blood cell morphology in health and disease							

Examination of blood films parasites			
Bone marrow aspiration			
Bone marrow Trephine biopsy			
<u>Laboratory assessment of iron status</u> ***Estimation of serum iron*** ***Estimation of total iron-binding capacity*** ***Estimation of serum ferritin*** ***Estimation of serum transferrin, transferrin saturation and index and transferrin receptors*** ***Assay of serum hepcidin*** ***Estimation of free erythrocyte protoporphyrin***			
<u>Laboratory tests used in investigation of megaloblastic anemia</u> ***Me Measurement of red cell folate asurement of serum B12*** ***Measurement of intrinsic factor antibody*** ***Schilling test*** ***Measurement of serum gastrin*** ***Measurement of gastric juice PH***			

Measurement of gastric juice pH ***Measurement of serum methylmalonic acid*** ***Measurement of serum homocysteine*** ***Measurement of serum transcobolamin*** ***Measurement of serum holotranscobolamin***			
<u>Generic laboratory tests used in the investigation of hemolytic anemias</u> ***Measurement of seum bilirubin, haptoglobin and hemopexin*** ***Measurement of plasma hemoglobin, methemalbumin, methemoglobin, sulphemogloin and carboxyhemoglobin*** ***Demonstration of urobilinogen, hemosiderin, myoglobin and porphobilinogen urine***			
<u>Investigations of hereditary hemolytic anemias</u> ***Erythrocyte membrane protein analysis*** ***Osmotic fragility test*** ***Glycerol lysis-time, Cryohemolysis and autohemolysis tests*** ***Methemoglobin reduction and fluorescent screening tests for***			

G6PD deficiency ***Quantitative G6PD assay*** ***Detection of heterozygotes for G6PD deficiency*** ***Pyrimidine-5-nucleotidase screening test*** ***Identification of G6PD variants*** ***Pyruvate kinase assay*** ***Estimation of reduced glutathione*** ***Glutathione stability test*** ***Measurement of red cell 2,3-diphosphoglycerate*** ***Determination of the oxygen dissociation curve***			
<u>Investigation of hemoglobinopathies</u> ***Detection of hemoglobin variants:*** ***Cellulose acetate electrophoresis at alkaline pH*** ***Citrate agar electrophoresis at pH 6*** ***Agarose gel electrophoresis*** ***Automated HPLC*** ***Isoelectric focusing*** ***Detection of unstable hemoglobins*** ***Detection of***			

hemoglobin Ms ***Detection of altered affinity hemoglobins*** ***Sickling in whole blood*** ***HbS solubility test***			
<u>Investigation of thalassemia</u> ***Quantitation of Hb F*** ***Quantitation of Hb A2*** ***Assessment of the intracellular distribution of Hb F*** ***Fetal diagnosis of globin chain disorders***			
<u>Investigations of acquired hemolytic anemias</u> ***Antiglobulin (Coombs') test*** ***Acidified serum (Ham test)and Sucrose lysis tests***			
<u>Investigations of</u> ***<u>hemostasis</u>*** ***Measurement of prothrombin time*** ***Measurement of activated thromboplastin time*** ***Measurement of fibrinogen concentration (Clauss method)*** ***Estimation of bleeding time*** ***Clot solubility test for FXIII*** ***Detection of fibrin***			

(ogen) split products and D-dimer			
Detection of circulating coagulation inhibitor			
Bioassays of coagulation factors			
Von Willebrand factor antigen assay			
Platelet aggregometry			
Detection of carriers of congenital coagulation deficiency defects			
<u>Investigation of thrombotic</u>			
<u>tendency</u>			
Clot-based assay for activated protein C resistance			
Detection of factor V Leiden and prothrombinG20210A mutations			
Antithrombin, protein C and protein S assays			
Euglobuin lysis test			
tPA, PAI-1 and α 2-antiplasmin assay			
Markers of platelet and coagulation activation			
<u>Global tests of coagulation</u>			
Global protein c assay			
Thromboelastograph			
<u>Laboratory aspects of transfusion medicine</u>			

Pre-transfusion compatibility systems			
ABO and D grouping			
Antibody screening			
Antibody identification			
Selection and transfusion of red cells			
Cross-matching			
Compatibility testing in special transfusion situations			
Investigation of a transfusion reaction			
<u>Erythrocyte cytochemistry</u>			
Staining of siderotic granules			
Demonstration of Heinz bodies			
Demonstration of Hb H inclusions			
Demonstration of cellular Hb F (Kleihauer test)			
<u>Leucocyte cytochemistry</u>			
Myeloperoxidase			
Sudan black B			
Neutrophil alkaline phosphatase			
Acid phosphatase reaction			
Periodic acid Schiff			
Naphthol AS-D chloracetate esterase			
α-naphthyl butyrate			

esterase ***α -naphthyl acetate esterase*** ***Toludine blue stain***			
<u>Immunophenotyping</u> **Flow cytometry** **Immuncytochemistry**			
<u>Diagnostic radioisotopes in hematology</u> **Measurement of blood volume** **Splenic red cell volume** **Ferrokinetics** **Estimation of the life span of red cells in vivo** **Compatibility test** **Visualization of the spleen by scintillation** **Measurement of blood loss from GIT** **Measurement of platelet life span**			
Flow Cytometry analysis in hematology			
Cytogenetic analysis in hematology			
Molecular analysis in hematology			
<u>Interpretation of hematology laboratory data</u> **Reference ranges and normal values** **Analysis of instrumental data output** **Case studies in hematology**			

2-Clinical Chemistry

Title of the course: Clinical Chemistry

Course code: CPATH 630 CC

CPATH 630 CCP

Credit hours:

CPATH 630 CC: 8 hours

CPATH 630 CCP: 4 hours

Teaching hours:

CPATH 630 CC: 120 hours

CPATH 630 CCP: 120 hours

N.B: In each subject; an introductory hint of the basis will be followed by updates in that subject in relation to management of the related clinical situation.

SCIENTIFIC LECTURES

Date	Title	Supervisor's signature
	Carbohydrate homeostasis	
	DM pathogenesis, C/P complications & diagnosis (Updates)	
	Classification of lipids & lipid metabolism	
	Cardiovascular risk factors	
	Metabolic syndrome	
	Amino acids classification and metabolism	
	Protein structure & metabolism	
	Acute phase proteins	
	Inborn error of metabolism I	
	Inborn error of metabolism II	
	Inborn error of fatty acids and organic acids metabolism	
	Physiology of normal renal functions & Glomeruler & tubular function tests	
	Chemical pathology of renal disorders	
	Water homeostasis & related factors	
	Electrolyte balance, electrolyte disturbance and there assay	
	Acid base balance disorders	
	Physiology of liver function & Liver function tests	

	Chemical pathology of hepatic disorders	
	Gastric function tests and gastric diseases	
	Exocrine pancreatic function tests & pancreatic diseases	
	Intestinal function tests & malabsorbtion syndromes	
	Cardiac function study	
	Diagnosis of ischemic heart diseases	
	Rule of laboratory in diagnosis & follow up of heart failure & hypertension	
	Clinical enzymology I	
	Clinical enzymology II	
	Clinical enzymology III	
	Ca homeostasis & assay	
	Phosphorous & Mg disorders & assay	
	Markesr of bone turnover	
	Vitamin assessment	
	Multiple endocrine neoplasm	
	Trace element assessment	
	Nutrition and obesity	
	Biochemical Tumor markers	
	Hypothalamopituitary unit	
	Hypothalamopituitary adrenal axis	
	Hypothalamopituitary thyroid axis	
	Pancreatic hormones	
	Reproductive related disorders	
	Clinical chemistry of pregnancy & fetal	

	monitoring	
	Assessment of porphyrins and disorders of porphyrin metabolism ***Iron homeostasis***	
	Clinical chemistry of pediatric	
	Clinical chemistry of geriatric	
	Adipose tissue as an endocrine organ	
	Applications of molecular biology in clinical chemistry	
	Microarray in clinical chemistry	
	Therapeutic drug monitoring	
	Updates in Clinical Chemistry - ***Genetic updates in clinical chemistry*** - ***Metabolic updates in clinical chemistry*** - ***Free radicals & oxidative stress*** - ***Cytokines, endothelial markers & oxidant stress.*** - ***Trace elements, elicit substance abuse & toxic elements in clinical chemistry field.*** - ***Newly advanced markers in disease management & prognosis.*** - ***Proteomics/genomics applications in clinical chemistry*** - ***Nano-concepts in clinical lab. medicine***	

Practical Sessions

Skill	Level of performance			Trainee's assessment			Trainer's signature
	Observation	Assistance	Independence	Poor	Fair	Good	
Basic Lab supplies • ***Units.*** • ***Water.*** • ***Solutions***							
Spectrometry							
Separation tech • ***Chromatography*** • ***Electrophoresis*** • ***GC/MS***							
Osmometry							
Electrochemistry • ***Potentiometry*** • ***Amperometry***							
POCT							
Q.C • ***Charts*** • ***Evaluations***							
Reference values							
Immunoassays & automation							
Dry chemistry & nanotechnology							
Carobhydrates • ***Glucose*** • ***Specimen*** • ***Andyticol method*** • ***Ref. Value*** • ***Oral glucose tolerance***							

Glycated Hb • ***Specimen*** • ***Analytical method*** • ***Ref. Interval*** • ***Clinical significance***			
Lipogram • ***specimen*** • ***analytical methods*** • ***clinical significance*** • ***LDL calculation*** • ***Metabolic syndrome*** • ***Risk assessment***			
Protein • ***Plasma proteins and albumin*** • ***Specimen*** • ***Analytical methods*** • ***Clinical significance*** • ***Ref. Values***			
Urinary protein • ***Specimen collection*** • ***Analytical methods*** • ***Clinical significance*** • ***Ref. interval*** • ***ACR (Albumin / create ratio)***			
Non Protein nitrogenous compound urea/ creatinine / uric acid. • ***clinical significance*** • ***analytical methods*** • ***critical values*** • ***specimen*** • ***Ref. interval***			
Electrolytes ***- Na+, K+, Cl-, HCO3-*** ***- Clinical significance*** ***- Specimen*** ***- Analytical method*** ***- Ref. interval*** ***- Critical values*** ***- Anion gap, osmal gap***			

Blood gases • ***Specimen*** • ***Clinical significance*** • ***Ref. Values*** • ***Critical values***			
Bone minerals: Ca, ph, Mg++ • ***Specimen*** • ***Clinical significance*** • ***Analytical methods*** • ***Ref value*** • ***Critical value***			
Enzymes • ***Liver Enzymes*** • ***(ALT. AST, ALP, s'nucleotide& GT)*** • ***Cardiac and skeletal ms (CK , LDH)*** • ***Pancreatic enzymes (amylase , lipase)*** • ***Miscellaneous enzymes***			
Urine analysis: • ***Physical*** • ***Chemical***			
Seminal fluid analysis • ***CSF analysis*** • ***Physical*** • ***Chemical***			
Peritoneal, pleural, synovial fluid and pericar dial fluid analysis. • ***Physical*** • ***Chemical*** • ***Microscopic*** • ***Specimen***			
Amniotic fluid testing: • ***Cytogentic studies*** • ***AFP*** • ***Acetyl cholin tore*** • ***Evaluation of fetal lung maturity*** • ***Tests for isoimmunization***			
Evidence-based laboratory medicine			

3-Clinical Microbiology and Immunology

Title of the course: Clinical Microbiology and Immunology

Course code: CPATH 630 CMI

CPATH 630 CMIP

Credit hours:

CPATH 630 CM: 8hours

CPATH 630 CMP: 4 hours

Teaching hours:

CPATH 630 CM: 120 hours

CPATH 630 CMP: 120 hours

SCIENTIFIC LECTURES(Clinical Microbiology)

Date	Title	Supervisor's signature
	1- Introduction to clinical microbiology	
	Cell structure, physiology, metabolism and genetics	
	Classification of microbes	
	Introduction to viral infections	
	Introduction to fungal infections	
	Bacterial flora	
	Performance improvement in the Microbiology laboratory	
	• Antimicrobial drugs ***- Classification*** ***- Mechanism of action***	
	Molecular diagnosis	
	Immunodiagnosis of infective syndromes	
	Disinfection and sterilization	
	Automation : principles of instruments used in microbiology lab.	
	*** Lab. Identification of significant isolates :-**	
	Staphylococci.streptococci, enterococci and other catalase positive Gram positive cocci	

	Neisseria , Moraxella, Haemophilus and other fastidious gram negative Bacteria	
	Enterobacteracae	
	Vibrio , aeromonas, campylobacter and and Non fermentive Gram negative bacilli	
	Anaerobes	
	Chlamydia & Rickettsia	
	Mycoplasma and ureaplasma	
	3- Lab. diagnosis of infectious diseases :	
	Upper and lower respiratory tract infections	
	Skin and soft tissue infections	
	Anaerobic infections	
	GIT and food poisoning	
	Infection of central nervous system	
	Bacteraemia and septicaemia	
	Urinary tract infections	
	Genital infections and sexually transmitted diseases	
	• Infection in special population : ***- In transplant patients*** ***- In children*** ***- In HIV patients*** ***- Opportunistic infection***	
	Occular infections	
	Pyrexia of unknown origin	
	• Mycobacterial infection	

	- Classification *- Pathophysiology* *- Epidemiology* *- Multidrug resistance & its mechanism* *- Public health concern*	
	4-Clinical syndromes associated with viral infections	
	5- Fungal infections *- Pathophysiology* *- Transmission* *- Clinical presentations* *- Epidemiology* *- Diagnosis (Superficial & deep) .*	
	Infection control	
	Parasitic infections *- Intestinal parasites* *- Tissue parasites* *- Blood parasites* *- Protozoa*	
	**** Biofilm***	
	**** Host – parasite interrelationship***	
	**** Antimicrobial drug resistance &mobile genetic elements***	
	**** Probiotics***	
	**** Bioterrorism***	
	**** Biohazard and Biosafety***	

	Air and water pollution ***- Testing of quality*** ***- related Biohazards***	
	**** Nanotechnology in clinical microbiology***	
	**** Emerging pathogens***	
	**** Infection control guidelines***	
	**** Public health principles and interrelation between diagnostic lab. and public health agencies***	
	**** Chronic fatigue syndrome (Microbiological causes)***	

Practical Sessions(Clinical Microbiolgy)

Skill	Level of performance			Trainee's assessment			Trainer's signature
	Observation	Assistance	Independence	Poor	Fair	Good	
Specimen collection in the microbiology lab.							
Microscopes in microbiological diagnosis							
Media used for isolation of microorganisms							
Staining techniques and its interpretation							
Presumptive identification of bacterial growth :- • ***Colonial morphology*** • ***Biochemical identification(manual & automated)*** • ***Antimicrobial susceptibility tests*** • ***principle of (MICs, breakpoints, disc diffusion, agar dilution).***							
Immunodiagnosis of infective syndromes							
Automation							
Application of Molecular methods in diagnostic microbiology • ***DNA & RNA extraction*** • ***Amplification*** • ***Detection (gel electrophoresis)***							

Schematic outlines of microbiological diagnosis			
Examination of :- • ***Sputum*** • ***Throat & mouth specimens*** • ***Pus, ulcer material, skin specimens*** • ***Effusion*** • ***C.S.F*** • ***Urine*** • ***Stool*** • ***Urogenital sample & semen*** • ***Blood***			
Sterilization method			
Anaerobic isolation & identification			
Water related dis. and testing of water supplies			
Virology • ***Specimen*** • ***Transport*** • ***Methods***			
Mycology • ***Specimen*** • ***Direct examination*** • ***Culture*** • ***Interpretation of results***			
TB • ***Staining methods of Acid fast bacilli*** • ***Interpretation of ZN stained smear*** • ***Decontamination procedures*** • ***Methods of Mycobacterial culture & identification*** • ***Molecular***			

methods for diagnosis of Mycobacteria • ***Indirect methods of diagnosis of Tuberculosis*** • ***Antituberculous susceptibility testing***			
Interpretation of microbiological results			
Atypical organisms • ***Mycoplasma*** • ***Leigonella*** • ***Chlamydia*** • ***Spirochates***			

SCIENTIFIC LECTURES (Clinical Immunology)

Date	Title	Supervisor's signature
	Introduction to Immune System	
	Immune response part I	
	Immune response part II	
	Innate Immunity Part I	
	Innate Immunity Part II	
	Antigen and Immunogene	
	T-lymphocytes & Tregs	
	B-lymphocytes	
	Immunoglobulin	
	Receptor Diversity	
	NK and KIR	
	Antigen-presenting cell , Ag processing and presentation	
	Complement system	
	Major histocompatibility complex	
	Histocompatibility testing	
	Cytokines	
	Chemokines	
	Tolerance & Autoimmunity	
	Evaluation of Immune-competence	
	Immunodeficiency syndromes Part I	
	Immunodeficiency syndromes Part II	
	Hypersensitivity Part I	
	Hypersensitivity Part II	
	Immune-mediated Rheumatic diseases Part I	

	Immune-mediated Rheumatic diseases Part II	
	Immune-mediated GIT& Hepatobiliary diseases	
	Immune-mediated Endocrine dis.	
	Tumor Immunology	
	Transplant Immunology Part I	
	Transplant Immunology Part II	
	Stem cell transplant	
	Immunologic therapy	
	Reproduction and immune system	
	Immune-mediated hematologic diseases	
	Inflammation	
	Mucosal Immunity	
	Immune-mediated vascular disease	
	Immune-mediated neurologic disease	
	Immune modulating therapy	
	Gene therapy	
	Cell cycle kinetics	
	Introduction to molecular biology	
	Molecular biology in immunology	

Practical Sessions(Clinical Immunology)

Skill	Level of performance			Trainee's assessment			Trainer's signature
	Observation	Assistance	Independence	Poor	Fair	Good	
Immunodiffusion methods							
Nephlometry							
Immunoelectrophoresis methods							
Enzyme immunoassay							
Immunoflourescence methods							
Agglutination assays							
Complement assays							
Lymphocyte separation							
Lymphocyte activation							
Flowcytometery principles and applications							
Lymphocyte assays							
Neutrophil function							
HLA-typing by serology							
Cross match							
Cellular typing & PRA							

PCR principles and applications			
How to prepare solution for molecular biology			
DNA extraction			
HLA-typing by Innolipa			
Agarose gel elctrophoresis			
HLA-typing by SSP			
RFLP			
ARMS			
Allergy & Immunocap			
Instrument in cl. Immunology lab			

III- Second Part Elective Courses

1- Stem Cells

Title of the course: Stem Cells

Course code: CPATH 630 SC

Credit hours: 1

Teaching hours: 15

Scientific Lectures

Date	Title	Supervisor's signature
	Stem cell: General issues	
	Stem cell separation	
	Stem cell culture	
	Stem cell niche	
	Immunogenetics of stem cells	
	Cancer stem cell and leukemic stem cell	
	Stem cell transplantation	
	Stem cell plasticity	

2- Principles of Molecular Genetics

Title of the course: Principles of Molecular Genetics

Course code: CPATH 630 PMG

Credit hours: 1

Teaching hours: 15

Scientific Lectures

Date	Title	Supervisor's signature
	Basic DNA structure	
	Gene structure and expression	
	Methods of DNA analysis	
	Gene mutations	
	Gene polymorphisms	
	The cell cycle	
	Molecular basis of Cancer	
	DNA-based HLA typing	
	Microbial genetics	
	Microbial phylogenetic analysis	
	Human Genome project, genomics & epigenetics	

IV- Scientific activities

1-Thesis discussion attendance:

Date	Title of the thesis	Supervisor's signature

2-Conference attendance:

Date	Title of the Conference	President's Signature

3-Workshop attendance:

Date	Workshop title	Organizer’ s signature

V- Thesis

Credit hours: 15

Title of the thesis	Date of discussion	Principal supervisor's signature

VI-Appendix