COURSE SPECIFICATION

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Program offering the course	**Postgraduate Doctor Degree in Clinical Pathology-CPATH 630**
(2) Department offering the program	**Clinical Pathology Department**
(3) Department responsible for teaching the course	**Clinical Pathology Department**
(4) Part of the program	**First part**
(5) Date of approval by the Department`s council	**16 – 5 - 2016**
(6) Date of last approval of program specification by Faculty council	9/8/2016
(7) Course title	**Basics of Clinical Pathology**
(8) Course code	**CPATH 630 BCP**
(9) Credit hours	5
(10) Total teaching hours.	75

(B) Professional information

(1) Course Aims:

The broad aims of the course are as follows: (either to be written in items or as a paragraph)

The overall aim of the course is to;
Provide the students with the basic knowledge essential for study and practice of Hematology, Clinical Chemistry , Clinical microbiology and Clinical Immunology

(2) Intended Learning Outcomes (ILOs):

Intended learning outcomes (ILOs); Are four main categories: knowledge & understanding to be gained, intellectual qualities, professional/practical and transferable skills.

On successful completion of the course, the candidate will be able to:

A- Knowledge and Understanding

A1-Recognize the basic structure of the bone marrow and lymphoid tissues
A2-Identify the stages and regulatory mechanisms of hemopoiesis
A3-Define red cell structure and metabolism
A4-Describe the basic physiology of hemostasis
A5- Recognize the general supplies and operations of clinical chemistry laboratory
A6- Identify the reference interval theory
A7- Define screening tests of important chemical pathology diseases
A8- Describe point of care testing and dry chemistry
A9- Define the critical points in collection and processing of microbiological specimens
A10- Outline the principles and uses of sterilisation and disinfection procedures for preparation of media and reprocessing of instruments
A11- Explain the evidence base behind standards of practice (SOPs) and the importance of internal and external quality control to establish validity in microbiological laboratories
A12-Identify the principles of available typing methods of micro-organisms including, serotyping, phenotyping and genotyping
A13-Discuss the mechanisms of immune response
A14- Describe the structure of immunoglobulin, TCR and their diversity

B- Intellectual skills

B1-Analyse the molecular regulatory mechanisms of iron homeostasis
B2-Interpret data of cluster of differentiation antigens analysis
B3-Apply the genetic principles in diagnosis of hematological disorders
B4- Demonstrate the role cell cycle regulatory mechanisms and signal transduction pathways in oncogenesis
B5- Interpret different electrophoresis patterns
B6- Apply separation analytical methods in clinical chemistry laboratory work
B7- Use the principles of quality management in clinical chemistry laboratory
B8- Distinguish different designs of biochemistry analyzers
B9- Interpret the results of different antimicrobial susceptibility testing including disc diffusion, MIC and MBC
B10- Use appropriate laboratory methods for identification of various types of micro-organisms
B11- Apply the recommended guidelines for hospital acquired infections
B12- Use automated culture systems for rapid microbilogical diagnosis
B13-Employ principles of molecular cell biology in immunology laboratory
B14-Use appropriate laboratory tests for assessment of immune competence

(3)Course content:

I- Basics of Hematology .

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
The structure of the marrow and the hematopoietic microenvironment	1				1
The lymphoid tissues	1				1
Hematopoietic stem cells.	1				1
Erythropoiesis	1				1
Granulopoiesis	1				1
Lymphopoiesis	1				1
Thrombopoiesis	1				1
Red cell structure and metabolism	1				1
Globin gene expression	1				1
Hemoglobin structure-function relationship	1				1
Iron homeostasis: Molecular control	1				1
Phagocytes	1				1
Physiology of hemostasis	1				1
Cell cycle regulation and apoptosis	1				1
Cellular signal transduction pathways	1				1
Principles of immunohematology	1				1
Quality assurance in hematology laboratory	1				1
Genetic principles and molecular biology	1				1
Cluster of differentiation antigens	1				1
Organization and management of Hematology laboratory	1				1
Automation in Hematology Laboratory	1.5				1.5
Hematology in under-resourced laboratories	1				1

II– Basics of Clinical Chemistry.

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
General lab. Supplies: ***Lab. Glass ware*** ***Types*** ***Cleaning*** ***Lab. plastic ware*** ***Types*** ***Cleaning*** ***Volumetric equipments*** ***- Pipettes (Method of calibration)*** ***- Volumetric flasks*** ***- Graduated cylinder***	1				1
Laboratory operations ***- Counting actions (Types /operation and maintenance)*** ***- weighing (Types / operation and maintenance)***	1				1
Calculation in clinical chemistry ***Preparation of solution -*** ***Dilution of concentrated solutions -*** ***Percent concentrations -*** ***Normal and Molar solutions -***	1				1
Specimen collection and handling ***- -Collection*** ***- -Types of samples*** ***- -Preservation and transport*** ***- -Separation and storage*** ***Saliva an alternative to laboratory samples***	1				1
Basic lab. Skills ***- Units*** ***- Centrifuges*** ***- Balances*** ***- Water*** ***- Chemicals***	1				1

- ***Reagent preparations*** - ***Desiccants*** - ***Mixers homogenizers*** - ***Pipettes***					
Spectrophotomety ***- Types*** ***- Components*** ***- Performance and standardization***	1				1
Nephlometry and turbidmetry: Principles and applications	1				1
Fluorometry. ***- Principles and applications***	1				1
Electrophoresis ***-Types*** ***- Factor affecting performance & results*** ***-Technical considerations,*** ***- Staining & clinical applications.*** ***- Scanning***	1				1
Chemiluminescence ***PriInciples and applications***	1				1
Osmometry ***- Types*** ***- Clinical significance***	0.5				0.5
Electrochemical techniques ***- Potentiometry types of electrodes*** ***- Amperometry principles and application (ISE)*** ***- Biosensores***	1				1
Chromatography ***- Types*** ***- Mechanism of separation*** ***- HPLC & GC/MS*** ***- Precautions***	1				1
Qualitative (imunoelectrophoresis, gel diffusion) - ***Qualitative*** - ***RID*** - ***Labeled assays (RIA, EIA)***	1				1
Nanotechnology	1				1

Automation & dry chemistry - ***Selection of an automated instrument***	1				1
Point of care testing& Panic values	1				1
Q.C for Selection and evaluation of methods	1				1
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***	1				1
Reference interval theory - ***Basis*** - ***Use*** - ***Calculations*** - ***Precautions during interpretation*** - ***Normal range Vs reference interval***	1				1
Screening tests - ***Value*** - ***Uses*** - ***Disadvantages and how to overcome***	0.5				0.5
Types & sources of error - ***Technical*** - ***Clerical***	0.5				0.5
Body fluids methods of assay and evaluations	0.5				0.5
Molecular techniques in clinical chemistry, e.g. PCR, FISH,….. Proteomics.	1.5				1.5

III- Basics of Clinical Microbilogy .

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
Classification of microbes	1				1
Specimen collection and processing	1				**1**
Isolating media, tissue culture and media preparation	**1**				**1**
Quality control in clinical microbiology and biohazards	**1**				**1**
Automation and computer in clinical microbiology	**1.5**				**1.5**
Identification techniques and Stains in microbiology	**1**				**1**
Basics in diagnostic virology , Mycology , Non conventional pathogen	**1.5**				**1.5**
Phenotypic and genotypic testing of micro-organisms	**1**				**1**
Antimicrobials : Principle of action & antimicrobial policy and resistance	1				1
Microbial evolution	1				1
Guidelines for hospital acquired infections	1				1
Basic immune response to microorganism	1				1
Sterilization And disinfection	1				1
Quantification in microbiology	1				1

IV- Basics of Clinical Immunology.

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
Immune response	1.5				1.5
Innate immunity & toll like receptors	1				1
B lymphocytes & Ig structure & diversity	1.5				1.5
T lymphocyte & TCR diversity & T reg	1.5				1.5
Complement system	1				1
MHC & Ag processing	1.5				1.5
NK cells & KIRs	1				1
Cytokines & chemokines	1				1
Tolerance & Autoimmunity	1.5				1.5
Molecular cell biology	1.5				1.5
Tests for immune competence	1				2

(4) Teaching methods:

4.1: Lectures

4.2: Self-learning

4.3: Student teaching

(5) Assessment methods:

5.1: Written examination

5.2: MCQ continuous assessment at the end of each semester

Percentage of each assessment to the total marks

Written exam: 80 %(80 marks)

MCQ exam: 20 %(20 marks)

Total : 100% (100 marks)

(6) References of the course:

6.1: Hand books: Guide to Clinical Pathology

6.2: Text books: William's Hematology

6.3: Journals: Blood, Hematology , Egyptian Journal of Hematology.

6.4: Text books: Teitz Text Book of Clinical Chemistry and Molecular Diagnostics

6.5: Journals: Journal of Clinical Chemistry

6.6: Text books: Microbiology in Clinical Practice

6.7: Journals: Journal of Clinical Microbiology .

6.8 Text books: Medical Immunology .

6.9: Journals: Egyptian Journal of Immunology.

Course coordinator: Prof. / Tarek Selim

Head of the department: Prof. / Osama Elbaz