PROGRAM SPECIFICATION

Faculty of Medicine- Mansoura University

(A) Administrative information

(1) Program Title & Code	Postgraduate Degree in Clinical Pathology-CPATH 530
(2) Final award/degree	Master Degree
(3) Department (s)	Clinical Pathology Department
(4) Coordinator	Prof. Tarek Selim Professor of Clinical Pathology, Faculty of Medicine, Mansoura University.
(5) External evaluator (s)	External Evaluator (s) Prof. Ola Sharaky Professor in Clinical Pathology Department, Faculty of Medicine, Alexandria University
(6) Date of approval by the Department`scouncil	6 / 4/ 2020
(7) Date of last approval of programspecification by Faculty council	20/9/2020

(B) Professional information

(1) Program Aims:

The overall aims of the program are to:

O1-Provide the students with the essential knowledge and professional skills of internal medicine related to the practice of clinical pathology .

O 2-Provide the student with the necessary technical knowledge of laboratory techniques based on the phenomenon of antigen –antibody interactions
O 3-Provide the student with the essential guidelines and attitudes for safe laboratory practice
O 4-Provide the student with the technical knowledge, technical skills to perform laboratory tests in the field of hematology as well as interpretative skills of hematology laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.
O 5-Provide the student with the technical knowledge, technical skills to perform laboratory tests in the field of clinical chemistry as well as interpretative skills of the clinical chemistry laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.
O 6-Provide the student with the technical knowledge, technical skills to perform laboratory tests in the field of clinical microbiology and immunology as well as interpretative skills of the clinical microbiology and immunology laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

(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 programme, the candidate will be able to:

A- Knowledge and Understanding

A1-Recall the theoretical basis of the internal medical conditions

A2-Recall the basic and clinical aspects of pharmacotherapy

A3-Recognize and outline initial and advanced management of emergency medical problems.

A4-Demonstrate sufficient knowledge to evaluate patients with an undiagnosed and undifferentiated presentation

A5-Describe the causes,pathophysiology and clinical picture of various type of anemias
A6-Recognize the presentation,diagnosis and classification of acute and chronic leukemias
A7-Define the diagnostic criteria of different myeloproliferative neoplasms
A8-Classify myelodysplasia according to WHO guidelines
A9-Outline the etiology, presentation and methods of diagnosis of various acquired and congenital platelet , coagulation and thrombotic disorders.
A10-Recognize clinical, laboratory and medicolegal aspects of blood transfusion
A11-Recall the hematological aspects of pregnancy and various systemic diseases

A12-Describe disorders of carbohydrate, lipid and protein metabolism
A13-List the important cardiac and tumor biomarkers
A14-Recognize the unique aspects of obstetric and pediatric chemical pathology
A15-Identify the appropriate laboratory tests for assessment of hypothalamic-pituitary, thyroid, adrenal and gonadal functions
A16-Explain the applications of molecular techniques in clinical chemistry laboratory
A17- Identify the different classes of microbes and the major characters of infections caused by each class
A18- Describe the principles, advantages and disadvantages of different methods used in diagnosis of infective syndromes.
A19- Outline the principles and uses of sterilization and disinfection procedures
A20- Describe the guidelines of controlling infections in hospitals including safety measures.
A21-Discuss the mechanisms of immune response
A22-Describe the structure of immunoglobulin, TCR and their diversity
A23-Outline the principles of autoimmunity and major autoimmune diseases
A24-List cytokines and chemokines
A25-Recognize the concepts of transplantation and tumor immunology and immune therapy
A26-Identify hazards related to handling chemicals, biologic specimens and radiologic materials

A27-Describe steps used as precautionary measures when working with electrical equipment, compressed gases, cryogenic materials and avoiding mechanical hazards associated with laboratory equipment

A28- Discuss safety awareness for clinical laboratory personnel

A29-List the responsibilities of employer and employee in providing a safe workplace

A30-List factors influencing antigen-antibody interactions

A31-Recognize basic principles of flow cytometry

A32-Define chemiluminescence and bioluminescence

A33-Describe the principles of immunodiffusion and labeled immunoassay techniques

B- Intellectual activities

B1- Demonstrate strengths, deficiencies, and limits in one's knowledge and expertise and be able to be updated and face challenges.
B2- Solve specific clinical problems despite limited resources.
B3- Analyze efficiently case scenarios and refer to the most appropriate diagnosis and possible differential diagnosis.
B4- Integrate knowledge and understanding of internal medicine and other medical specialties and interpret basic clinical tests and images as well as obscure findings to solve clinical problems.
B-5Distinguish between various types of anemias based on laboratory results
B6-Interpret the results of appropriate laboratory methods to establish the diagnosis of acute and chronic leukemias
B7-Use appropriate laboratory methods to establish the dignosis of various myeloproliferative neoplasms
B8-Analyze the results of appropriate laboratory methods to establish the diagnosis of myelodysplastic syndromes
B9-Interpret the results of laboratory screening tests for hemostasis and thrombophilia
B10-Use appropriately and competently basic chemical pathology laboratory techniques
B11-Compare different technologies and designs of biochemistry analyzers
B12- Interpret results of tests of assessment of mineral, bone,vitamines, porphyrin and trace element metabolism
B13- apply appropriate laboratory tests for assessment of hepatic , renal, gastric and pancreatic functions
B14- Apply the appropriate microbiological method for diagnosis of each type of infection
B15- Interpret the results of different microbiological methods used in diagnosis of infections.
B16- Analyze the results of investigations made for hospital acquired infections.
B17- Employ the suitable antibiotic policy for each hospital.
B18- Demonstrate the role of MHC and NK cell in immune response
B19-Use complement protein measurements to assess inherited and acquired immune deficiency states
B20-Employ principles of molecular cell biology in immunology laboratory
B21-Use appropriate laboratory tests for assessment of immune competence
B22-Apply the immunology laboratory tests for diagnosis of immune-mediated rheumatic, GIT, hepatobiliary and endocrine diseases
B23- Differentiate between different types of biologic safety cabinets
B24- Distinguish different classes of fires
B25- Use appropriate personal protective equipment when working in the clinical laboratory
B26- Apply safety guidelines in laboratory practice
B27- Interpret flow cytometer data print out
B28- Use laboratory data for selection of proper donor for transplantation
B29- Employ the different patterns of immunoelectrophoresis in clinical diagnosis
B30- Distinguish between different types of labeled immunoassays

C- Professional/practical skills

C1- Develop skills in history taking and clinical examination in different internal medicine specialties.

C2- Interpret laboratory and radiological findings in diagnosis and treatment of internal medical diseases.

C3- Carry out basic preventive care and counseling.

C4- Perform a consultative role to other physicians and health professionals.

C5-Perform different hematological tests for diagnosis of anemias
C6-Carry out different hematological tests for diagnosis of acute and chronic leukemias
C7-Develop skills in preparation, staining and examination of peripheral blood and bone marrow smears
C8-Perform blood grouping, cross matching and antiglobulin test
C9-Apply spectrometry and immunochemical techniques in laboratory work
C10-Perform assessment of blood gases, acid-base balance and serum electrolytes
C11-Carry out the appropriate laboratory tests for diagnosis of diabetes , dyslipidemias and inborn errors of metabolisms
C12-Be able to detect errors and sources of errors in interpretation of clinical chemistry laboratory data

C13- Perform the different microbiological methods used in diagnosis of infections
C14- Be able to identify the different types of organisms
C15- Develop skills in operating the automated culture systems used for rapid microbiological diagnosis
C16- Evaluate the safety measures used in microbiological laboratory
C17-Assess neutrophil function
C18-Carry out immunoglobulin, complement proteins and cytokine assays
C19-Be able to detect different autoantibody markers
C20-Perform isolation of mononuclear cells using density gradient separation techniques
C21-Observe HLA typing by different methods
C22- Use fire extinguishers appropriately

C23- Perform disposal of chemical, radioactive and biohazardous waste properly

C24- Be able to outline the steps required in documentation of an accident in the workplace.

C25- Set up methods of disinfection and sterilization in the laboratory
C26- Apply flow cytometric data in clinical diagnosis

C27- Use automated immunoassay systems in laboratory practice

C28- Set up a laboratory work up for donor selection for transplantation

C29- Perform different techniques of immunoglobulin, autoantibodies and complement detection

D- Communication & Transferable skills

D 1- Communicate effectively with patients, families, and the public as appropriate, across a broad range of socioeconomic and cultural backgrounds.
D2- Cooperate with diverse patient population including but not limited to diversity in gender, age, culture, race, religion, disabilities.
D3- Work effectively as a member or a leader of a health care team or other professional group.
D4- Use of information technology in the clinical practice.
D5- Demonstrate the ability to write an informative laboratory report including a precise diagnosis, differential diagnosis, and recommended follow up or additional studies as appropriate
D6- Demonstrate the ability to provide direct communication to the referring physician or appropriate clinical personnel when interpretation of a laboratory assay reveals an urgent , critical or unexpected finding and document this communication in an appropriate fashion
D7- Discuss professional errors in an honest way.
D8- Search effectively electronic resources to find valid appropriate information and use them for evidence-based diagnostic practice
D9-Show compassion : be understanding and respectful of patients, their families, and the staff and physicians caring for them .
D10- Interact with others without discrimination based on religious , ethnic , sexual , or educational differences .
D11- Work effectively and cooperatively and demonstrate interpersonal skills in functioning as member of a multidisciplinary health care team.
D12- Communicate with, consult and respect the role of other health care providers .
D13- Develop presentation skills in microbiology through laboratory meeting, seminars and multidisciplinary conferences
D14- Develop process of critical thinking during epidemics.
D15- Work as a member of epidemiological team
D16- Develop skills of presenting the preliminary results of serious infections to the referring physician
D17-Use computer software in diagnostic immunology
D18-Search literature for recent advances in clinical immunology
D19-Work effectively as a member of rheumatology team
D20-Develop presentation skills in immunology through laboratory meeting, seminars and multidisciplinary conferences
D 21- Communicate effectively with the public health agencies regarding the environmental safety issues
D22- Adopt principles of safe laboratory practice
D23- Work effectively as a safety control officer
D24- Search literature for updated laboratory safety guidelines
D 25- Search literature for newly developed immune-based techniques
D26- Develop presentation skills of knowledge related to immune-based technical methods
D27- Communicate with experts to discuss troubleshooting related to immune-based techniques
D28- Use computer soft ware for HLA typing

(3) Academic standards:

Academic standards for the programme are attached in Appendix I. in which NARS issued by the National Authority for Quality Assurance & Accreditation in Education are used being approved by the faculty council on 14/7/2010. External reference points/Benchmarks are attached in Appendix II being approved by the department council on 23/8/2010 and by the faculty council on 14/9/2010.

3.a- External reference points/benchmarks are selected to confirm the appropriateness ofthe objectives, ILOs and structure of assessment of the programme:

Academy of clinical Laboratory physicians and Scientistshttp://www.aclps.org/

3.b- Comparison of the specification to the selected external reference/ benchmark:

The aims of the Benchmark are covered by the current program. There are differences in the credit hours and the time table of the program. About 85% of the topics of the benchmark are covered in our program.

(4) Curriculum structure and contents:

4.a- Duration of the programme: 4 Semesters

4.b- programme structure:

Candidates should fulfill a total of 45 credit hours

- 4.b.1: Number of credit hours:

First part: 5 credit hours.

Second part:

18credit hours (lectures).

Practical training (14 hours) and other activities (2 hours).

-Logbook including clinical training, workshops, and training courses on diagnosticprocedures, and other scientific activities:

Dissertation: 6 credit hours.

● 4.b.2: Teaching hours/week (20 weeks):

First part: Lectures: 3 hours /week. Practical 1.5 hour/week

Second part: Lectures: 3 hours /week Practical: 2 hours/week. Total: 5 hours/week.

(1) Programme courses:

First part

a- Compulsory courses:

Course Title	Course Code	NO. of hours					Total teachin ghours	Programme ILOscovered (REFERRING TO MATRIX)
		Theoretical		Clinical	Field	Total		
		Lectures	seminars					
Internal Medicine related to Laboratory	CPATH 510 C	3		2		5	75	A1-A4,B1-B4 C1-C4,D1-D4

b- Elective courses:None

Second part

a-Compulsory courses:

Course Title	Course Cod	NO. of hours					Total teachin ghours	Programme ILOs covered(REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	Seminars					
Hematology	CPATH 530HE	6		5		11	240	A5-A10, B5-B9, C5-C8, D5-D8
Clinical Chemistry	CPATH 530CC	6		5		11	240	A11-A16, B10-B13, C9-C12, D9-D12
Clinical Microbiology and immunology	CPATH 530CMI	5		4		9	195	A17-A25, B14-B22, C13-C21, D13-D20

b-Elective courses

Course Title	Course Code	NO. of hours					Total teachin ghours	Programme ILOscovered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Laboratory safety	CPATH 510 C	1				1	15	A26-A29,B23-B26
Immune-based laboratory techniques	CPATH 530 IBLT	1				1	15	A30-A33, B27-B30

Programme-Courses ILOs Matrix

Programme ILOs are enlisted in the first row of the table (by their code number: a1, a2……etc), then the course titles or codes are enlisted in first column, and an "x" mark is inserted where the respective course contributes to the achievement of the programme ILOs in question.

P.S. All courses` specifications are attached in Appendix III.

Course Title/Code	Programme ILOs																																										
	a1	a2	a3	a4	a5	a6	a7	a8	a9	a1	a1	a1	a13	a1	a1	a1	a1	a1	a1	a20	a2	A2	A2	A2	A2	A2	A2	A	A2	A	A2	A3	A3	A3	A3	A3	A3	A3	A3	A4	41
Internal Medicine related to Laboratory Medicine	×	×	×	×																																						
Hematology					×	x	x	×	x	×																																	
Clinical Chemistry											x	x	x	x	x	x																											
Clinical Microbiology and immunology																	x	x	x	x	x	x	x	x	x																	
Laboratory safety																										x	x	x	x														
Immune-based laboratory techniques																														x	x	x	x									

P.S. All courses` specifications are attached in Appendix III.

Course Title/Code	Programme ILOs																																							
	b1	b2	b3	b4	b5	b6	b7	b8	b9	b1	b1	b1	b1	b1	b1	b1	b1	b1	b1	b20	b2	b2	b2	b2	b2	b26	B2	B28	B2	B3	B3	b3	B3	B3	B3	B3	B3	B3	B3	B4	B4
Internal Medicine related to Laboratory Medicine	×	×	×	×																																					
Hematology					x	x	x	×	x																																
Clinical Chemistry										x	x	x	x																												
Clinical Microbiolog yand immunology														x	x	x	x	x	x	x	x	x																			
Laboratory safety																							x	x	x	x															
Immune-based laboratory techniques																											x	x	x	x											

Course Title/Cod	Programme ILOs																														
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	C24	C25	C26	C27	C28	C29	C30
Internal Medicine related to LaboratoryMedicine	x	x	x	x																										
Hematology					x	x	x	x																						
Clinical Chemistry									x	x	x	x																		
Clinical Microbiology and immunology													x	x	x	×	×	×	×	×	×									
Laboratory safety																														
Immune-based laboratory																														

P.S. All courses` specifications are attached in Appendix III.

Course Title/Code	Programme ILOs																																							
	d1	d2	d3	d4	d5	d6	d7	d8	d9	d1	d1	d1	d1	d1	d1	d1	d1	d1	d1	d2 0	d2	d2	d2	d2	d2	d25	d2	d	d2	d3	d3	d3	d3	d3	d3	d3	d3	d3	d3	d4	41
Internal Medicine related to Laboratory Medicine	×	×	×	×																																					
Hematology					×	x	x	×																																	
Clinical Chemistry									x	x	x	x																													
Clinical Microbiolog yand immunology													x	x	x	x	x	x	x	x																					
Laboratory safety																																									
Immune-based laboratory techniques																																									

(1) Programme admission requirements:

- **General requirements:**

According to the faculty postgraduate bylaws

- **Specific requirements (if applicable):**

None

(2) Regulations for progression and programme completion:

Students must complete a minimum of 45 credit hours in order to obtain the Msc. degree, which includes the courses of the first and second parts, the thesis, and activities of the log book.

(3) Evaluation of Programme's intended learning outcomes (ILOs):

Evaluator	Tools*	Sample size
Internal evaluator **(s)** **Dr/ Hassan Abd El-GhaffarDr/ Kefaya El-Said** **Dr/ Hossam Zaghlool**	**Group discussion**	
External Evaluator **(s)** **Prof. Dr. Ola Sharaky** **Professor in Clinical Pathology Department, Faculty of medicine, Alexandria University**	**External evaluator checklistreport**	
Senior student **(s)**	**None**	
Alumni	**None**	
Stakeholder **(s)**	**None**	
others	**None**	

* TOOLS= QUESTIONNAIRE, INTERVIEW, WORKSHOP, COMMUNICATION, E_MAIL

We certify that all information required to deliver this programme is contained in the above specification and will be implemented. All course specification for this programme are in place.

Programme coordinator: Name **Prof.Dr/ Tarek Selim**	Signature & date:
Dean: Name: **Prof.Dr. Nesrene Salah Omar**	Signature & date:
Executive director of the quality assurance unit: _____ Name: **Prof. Nesrene Mohamed Shalaby**	Signature & date:

COURSE
SPECIFICATION
Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Program offering the course:	**Postgraduate Master Degree in Clinical Pathology-CPATH 530**
(2) Department offering the program	**Clinical Pathology**
(3) Department responsible for teaching thecourse:	**Clinical Pathology**
(4) Part of the program	**First Part**
(5) Date of approval by the Department`scouncil	6 / 4/ 2020
(6) Date of last approval of programspecification by Faculty council	**20/9/2020**
(7) Course title	**Internal Medicine related to Laboratory Medicine**
(8) Course code	**CPATH 510 C**
(9) Credit hours	**4(lectures) 1(clinical)**
(10) Total teaching hours:	90

Professional information

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 essential knowledge and professional skills of internal medicine related to the practice of clinical pathology .

(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-Recall the theoretical basis of the internal medical conditions

A2-Recall the basic and clinical aspects of pharmacotherapy

A3-Recognize and outline initial and advanced management of emergency medical problems.

A4-Demonstrate sufficient knowledge to evaluate patients with an undiagnosed and undifferentiated presentation

B- Intellectual skills

B1- Demonstrate strengths, deficiencies, and limits in one's knowledge and expertise and be able to be updated and face challenges.

B2- Solve specific clinical problems despite limited resources.

B3- Analyze efficiently case scenarios and refer to the most appropriate diagnosis and possible differential diagnosis.

B4- Integrate knowledge and understanding of internal medicine and other medical specialties and interpret basic clinical tests and images as well as obscure findings to solve clinical problems.

C- Professional/practical skills

C1- **Develop skills in history taking and clinical examination in different internal medicine specialties.**

C2- **Interpret laboratory and radiological findings in diagnosis and treatment of internal medical diseases.**

C3- **Carry out basic preventive care and counseling.**

C4- **Perform a consultative role to other physicians and health professionals.**

D- Communication & Transferable skills

D 1- **Communicate effectively with patients, families, and the public as appropriate, across a broad range of socioeconomic and cultural backgrounds.**

D2- **Cooperate with diverse patient population including but not limited to diversity in gender, age, culture, race, religion, disabilities.**

D3- Work effectively as a member or a leader of a health care team or other professional group.

D4- Use of information technology in the clinical practice.

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
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(4) Teaching methods:

4.1: Lectures

4.2: Case study

4.3 : Online teaching

4.4: Interactive sessions.

(5) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.5.2: Oral exam for assessment of knowledge & intellectual skills.

5.3: Clinical exam for assessment of practical and transferrable skills.

5.4: MCQ continuous assessment at the end of each semester.

Percentage of each Assessment to the total mark:Written exam: 48% (144 marks)

Oral exam: 20% (60 marks)

Clinical exam: 20% (60 marks)

MCQ exam: 12% (36 marks)

(6) References of the course:

6.1: Textbooks:

A- Kasper D, Fauci A, Hauser S, Longo D, Jameson JL and Loscalzo J. (2018). Harrison's Principles of Internal Medicine (20th ed.). McGraw-Hill.

B-*Hui, D (2011*). Approach to Internal Medicine: A Resource Book for Clinical Practice (Third Ed). Springer Science

6.2: Journals: Annals of Internal Medicine

Course coordinator: Prof. Tarek Selim

Head of the department: Prof. Shereen Salah.

Executive director of the quality assurance unit: Prof. Nesrene Mohamed Shalaby.

COURSE

SPECIFICATION

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Program offering the course:	**Postgraduate Master Degree in Clinical Pathology-CPATH 530**
(2) Department offering the program	**Clinical Pathology Department**
(3) Department responsible for teaching thecourse:	**Clinical Pathology Department**
(4) Part of the program	**Second part**
(5) Date of approval by the Department`scouncil	6 / 4/ 2020
(6) Date of last approval of programspecification by Faculty council	20/9/2020
(7) Course title:	**Hematology**
(8) Course code:	**CPATH 530HE** **CPATH 530 HEP**
(9) Credit hours	**CPATH 530HE (6)** **CPATH 530HE HEP (5)**
(10) Total teaching hours:	**CPATH 530HE** (90) **CPATH 530 HEP** (150)

(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 student with the technical knowledge, technical skills to perform laboratory tests in the field of hematology as well as interpretative skills of hematology laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

(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-Describe the causes, pathophysiology and clinical picture of various type of anemias
A2-Recognize the presentation, diagnosis and classification of acute and chronic leukemiasA3-Define the diagnostic criteria of different myeloproliferative neoplasms
A4-Classify myelodysplasia according to WHO guidelines
A5-Outline the etiology, presentation and methods of diagnosis of various acquired and congenital platelet , coagulation and thrombotic disorders.
A6-Recognize clinical, laboratory and medicolegal aspects of blood transfusion
A7-Recall the hematological aspects of pregnancy and various systemic diseases

B- Intellectual skills

B-1Distinguish between various types of anemias based on laboratory results
B2-Interpret the results of appropriate laboratory methods to establish the diagnosis of acute and chronic leukemias
B3-Use appropriate laboratory methods to establish the diagnosis of various myeloproliferativeneoplasms
B4-Analyze the results of appropriate laboratory methods to establish the diagnosis of myelodysplastic syndromes
B5-Interpret the results of laboratory screening tests for hemostasis and thrombophilia

C- Professional/practical skills

C1-Perform different hematological tests for diagnosis of anemias
C2-Carry out different hematological tests for diagnosis of acute and chronic leukemias
C3-Develop skills in preparation, staining and examination of peripheral blood and bone marrow smears
C4-Perform blood grouping, cross matching and antiglobulin test

D- Communication & Transferable skills

D1- Demonstrate the ability to write an informative laboratory report including a precise diagnosis, differential diagnosis, and recommended follow up or additional studies as appropriate

D2- Demonstrate the ability to provide direct communication to the referring physician or appropriate clinical personnel when interpretation of a laboratory assay reveals an urgent , critical or unexpected finding and document this communication in an appropriate fashion

D3- Discuss professional errors in an honest way.

D4- Search effectively electronic resources to find valid appropriate information and use them for evidence-based diagnostic practice

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
Hemopoiesis:General considerations	1		1		2
Erythropoiesis	1		2		3
Microcytic hypochromic anemias: Generalaspects	1		2		3
Iron-deficiency anemia	2		3		5
Anemia of chronic disease	1		1		2
Sideroblastic anemia	1		1		2
The thalassemias	2		3		5
Iron overload	1		3		4
Megaloblastic anemia	2		3		5
General aspects of hemolytic anemias	1		3		4
Red cell membranopathies	2		3		5
Red cell enzymopathies	2		3		5
Hemoglobinopathies	2		3		5
Immune hemolytic anemias	2		3		5
Non-immune hemolytic anemias	2		3		5
Aplastic anemia and Pure red cell aplasia	2		3		5
Pancytopenia	2		3		5
Granulopoiesis	2		3		5
Benign disorders of granulocytes	2		3		5
Lymphopoiesis	2		3		5
Benign disorders of lymphocytes	2		3		5
Benign disorders of monocytes	2		3		5
The spleen	1				1
Acute lymphoblastic leukemia	2		4		6
Acute myeloid leukemia	2		4		6
Myelodysplasia	2		3		5
Chronic myeloid leukemia	2		3		5

Polycythemia	2		3		5
Myelofibrosis	2		3		5
Primary thrombocythemia	1		3		4
Chronic lymphocytic leukemias	2		4		6
Laboratory aspects of lymphoma	2		3		5
Multiple myeloma	1		3		4
Normal hemostasis	2		2		4
Thrombopoiesis	1				1
Vascular purpuras	1		3		4
Thrombocytopenia	2		3		5
Thrombocytosis	1		3		4
Hereditary qualitative platelet disorders	1		3		4
Acquired qualitative platelet disorders	1		3		4
Hemophilia	1		3		4
vonWillebrand's disease	1		3		4
Acquired coagulopathies	1		3		4
Hereditary thrombophilia	1		3		4
Acquired thrombophilia	1		3		4
Antithrombotic therapy	2		3		5
Red cell antigens and antibodies	2		3		5
Leukocytes and platelet antigen and antibodies	2		3		5
Donor selection and pretransfusion testing	1		3		4
Blood components therapy	2		3		5
Complications of blood transfusion	2		3		5
Autologous blood transfusion	1				1
Therapeutic apheresis	2		3		5
Hematologic aspects of systemic diseases	2		2		4
Hematology in pregnancy	2		2		4
Neonatal hematology	2		2		4

(3) Teaching methods:

4.1: Lectures

4.2: Case study

4.3: Practical Lab

4.4: Self-learning

4.5: Student teaching

4.6: interactive sessions.

4.7:Online teaching.

(4) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.5.2: Oral exam for assessment of knowledge & intellectual skills.

5.3: Practical exam for assessment of practical and transferrable skills.5.4: MCQ continuous assessment at the end of each semester

Percentage of each Assessment to the total mark:

Written exam: 40% (160 marks)

Practical exam: 25% (100 marks)

Oral exam: 25% (100 marks)

MCQ exam: 10% (40 marks)

(5) References of the course:

6.1: Hand books:

a-Guide to Clinical Pathology

b-Barbara J. Bain, Imelda Bates, Mike A Laffan(2017).

Dacie and Lewis Practical Haematology(12 th ed.) . Elsevier Health Sciences.

6.2: Text books:

a- Hoffbrand AV, Steensma DP.(2019

).Hoffbrand's Essential Haematology, (8th

ed.) Wiley-Blackwell.

b- Wintrobe MM& Greer JP. (2018) Wintrobe's Clinical Hematology, (14th ed.).

WoltersKluwer.

.https://clarafranciosi.tumblr.com/.../wintrobes-clinical-hematology-14th-edition

6.3: Journals: Blood.

Egyptian J of Hematology.

Course coordinator: Prof. Tarek Selim

Head of the department: Prof. Shereen Salah

COURSE
SPECIFICATION
Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Programme offering the course:	**Postgraduate Master Degree in Clinical Pathology-CPATH 530**
(2) Department offering the program	**Clinical Pathology Department**
(3) Department responsible for teaching thecourse:	**Clinical Pathology Department**
(4) Part of the program	**Second Part**
(5) Date of approval by the Department`scouncil	6/4 / 2020
(6) Date of last approval of programspecification by Faculty council	20/9/2020
(7) Course title:	**Clinical Chemistry**
(8) Course code:	**CPATH 530CC** **CPATH 530 CCP**
(9) Credit hours	**CPATH 530CC (6)** **CPATH 530CCP (5)**

(10) Total teaching hours:	**CPATH 530** CC (90) **CPATH 530** CCP (150)

(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 student with the technical knowledge,technical skills to perform laboratory tests in the field of clinical chemistry as well as interpretative skills of the clinical chemistry laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

(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-Describe disorders of carbohydrate, lipid and protein metabolism
A2-List the important cardiac and tumor biomarkers
A3-Recognize the unique aspects of obstetric and pediatric chemical pathology
A4-Identify the appropriate laboratory tests for assessment of hypothalamic-pituitary, thyroid, adrenal and gonadal functions
A5-Explain the applications of molecular techniques in clinical chemistry laboratory
.

B- Intellectual skills

B1-Use appropriately and competently basic chemical pathology laboratory techniques
B2-Compare different technologies and designs of biochemistry analyzers
B3- Interpret results of tests of assessment of mineral, bone,vitamines, porphyrin and trace element metabolism
B4- apply appropriate laboratory tests for assessment of hepatic , renal, gastric and pancreatic functions

C- Professional/practical skills

C1-Apply spectrometry and immunochemical techniques in laboratory work
C2-Perform assessment of blood gases, acid-base balance and serum electrolytes
C3-Carry out the appropriate laboratory tests for diagnosis of diabetes , dyslipidemias and inborn errors of metabolisms
C4-Be able to detect errors and sources of errors in interpretation of clinical chemistry laboratory data

D- Communication & Transferable skills

D1-Show compassion : be understanding and respectful of patients, their families, and the staff and physicians caring for them .

D2- Interact with others without discrimination based on religious , ethnic , sexual , or educational differences .

D3- Work effectively and cooperatively and demonstrate interpersonal skills in functioning as member of a multidisciplinary health care team .

D4- Communicate with, consult and respect the role of other health care providers .

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours	
Carbohydrate homeostasis	2		4		5	
DM pathogenesis, C/P, complications & diagnosis.	2		4		6	
Classification of lipids & lipid metabolism	2		4		5	
Cardiovascular risk factors	2		4		5	
Amino acids classification and Protein structure	2		3		4	
Acute phase proteins	3		4		6	
Inborn error of metabolism: - ***Inborn error of amino acids*** - ***Inborn error of fatty acids and organic acids metabolism.***	3		4		7	
Physiology of normal renal functions, Glomerular & tubular function tests	2		4		4	
Chemical pathology of renal disorders	3		4		7	
Water homeostasis & Electrolyte balance	2		4		7	
Acid base balance disorders	2		4		6	
Physiology of liver function & Liver function tests	2		4		4	
Chemical pathology of hepatic disorders	3		4		7	
Gastric function tests and gastric diseases	3		4		7	
Exocrine pancreatic function tests, intestinal function tests & malabsorption syndromes	3		4		7	
Cardiac function study	2		4		5	
Diagnosis of ischemic heart diseases	2		3		4	
Clinical enzymology I	2		4		5	
Clinical enzymology II	2		4		5	
Ca homeostasis & assay	2		4		5	
Phosphorous & Mg disorders & assay	2		4		6	
Vitamin assessment I	2		4		5	

Vitamin assessment II	2		4		5	
Trace element assessment Iron metabolism	3		4		7	
Nutrition and obesity	2		3		5	
Biochemical Tumor markers I	2		3		5	
Biochemical Tumor markers II	2		3		5	
Hypothalamopituitary adrenal axis	2		3		5	
Hypothalamopituitary thyroid axis	2		3		5	
Pancreatic hormones	2		4		5	
Reproductive related disorders	2		4		6	
Clinical chemistry of pregnancy Fetal risk assessment	3		4		7	
Assessment of porphyrins and disorders of porphyrin metabolism.	3		4		7	
Clinical chemistry of pediatric	2		4		6	
Multiple endocrine neoplasm	3		4		7	
Clinical chemistry of geriatric	2		4		6	
Adipose tissue as an endocrine organ	2		4		6	
General Principals of molecular biology techniques	3		4		7	
Applications of molecular biology in clinical chemistry	3		5		9	

(4) Teaching methods:

4.1: Lectures

4.2: Case study

4.3: Practical Lab.

4.4: Self-learning

4.5: Student teaching

4.6: Online teaching : https://youtu.be/zDLuaD_qmE0

https://youtu.be/tw7L3pI0DPg

(5) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.5.2: Oral exam for assessment of knowledge & intellectual skills.

5.3: Practical exam for assessment of practical and transferrable skills.

5.4: MCQ continuous assessment at the end of each semester

Percentage of each Assessment to the total mark:

Written exam:	40%	(160 marks)
Oral exam	25%	(100 marks)
Practical exam:	25%	(100 marks)
M CQ exam:	10%	(40 marks)

(6) References of the course:

6.1: Text book:

a-Burtis, Edward R Ashwood and DavidE Bruns . (2012) Tietz Textbook of Clinical Chemistry and Molecular Diagnostics(5th ed). Philadelphia: Elsevier Saunders,

b- Carl A. Burtis, Edward R. Ashwood, and David E. Bruns . (2008).Tietz Fundamentals of Clinical Chemistry, (6th ed.). St Louis, MO: Saunders/Elsevier.

c- Sunheimer R , Graves L (2018)Clinical Laboratory Chemistry. (2nd Ed) Pearson

6.2: Journals: Clinical Chemistry

Course coordinator: Prof. Tarek Selim

Head of the department: Prof. Shereen Salah

COURSE SPECIFICATION

(A) Faculty of Medicine– Mansoura UniversityAdministrative information

(1) Program offering the course:	**Postgraduate Master Degree in Clinical Pathology-CPATH 530**
(2) Department offering the program	**Clinical Pathology Department**
(3) Department responsible for teaching thecourse	**Clinical Pathology Department**
(4) Part of the programme:	**Second part**
(5) Date of approval by the Department`scouncil	6/4/2020
(6) Date of last approval of programmespecification by Faculty council	20/9/2020
(7) Course title:	**Clinical Microbiology and Immunology**
(8) Course code:	**CPATH 530CMI CPATH 530CMIP**
(9) Credit hours	**CPATH 530CMI (5) CPATH 530CMIP (4)**
(10) Total teaching hours:	**CPATH 530CMI (75) CPATH 530CMIP (120)**

(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 student with the technical knowledge, technical skills to perform laboratory tests in the field of clinical microbiology and immunology as well as interpretative skills of the clinical microbiology and immunology laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

(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- Identify the different classes of microbes and the major characters of infections caused by each class
A2- Describe the principles, advantages and disadvantages of different methods used in diagnosis of infective syndromes.
A3- Outline the principles and uses of sterilization and disinfection procedures
A4- Describe the guidelines of controlling infections in hospitals including safety measures.
A5-Discuss the mechanisms of immune response
A6-Describe the structure of immunoglobulin, TCR and their diversity
A7-Outline the principles of autoimmunity and major autoimmune diseases
A8-List cytokines and chemokines
A9-Recognize the concepts of transplantation and tumor immunology and immune therapy

B- Intellectual skills

B1- Apply the appropriate microbiological method for diagnosis of each type of infection
B2- Interpret the results of different microbiological methods used in diagnosis of infections.
B3- Analyze the results of investigations made for hospital acquired infections.
B4- Employ the suitable antibiotic policy for each hospital.
B5- Demonstrate the role of MHC and NK cell in immune response
B6-Use complement protein measurements to assess inherited and acquired immune deficiency states
B7-Employ principles of molecular cell biology in immunology laboratory
B8-Use appropriate laboratory tests for assessment of immune competence
B9-Apply the immunology laboratory tests for diagnosis of immune-mediated rheumatic, GIT, hepatobiliary and endocrine diseases

C- Professional/practical

C1- Perform the different microbiological methods used in diagnosis of infections
C2- Be able to identify the different types of organisms
C3- Develop skills in operating the automated culture systems used for rapid microbiological diagnosis
C4- Evaluate the safety measures used in microbiological laboratory
C5-Assess neutrophil function
C6-Carry out immunoglobulin, complement proteins and cytokine assays
C7-Be able to detect different autoantibody markers
C8-Perform isolation of mononuclear cells using density gradient separation techniques
C9-Observe HLA typing by different methods

skills

D- Communication & Transferable skills

D1- Develop presentation skills in microbiology through laboratory meeting, seminars and multidisciplinary conferences
D2- Develop process of critical thinking during epidemics.
D3- Work as a member of epidemiological team
D4- Develop skills of presenting the preliminary results of serious infections to the referring physician
D5-Use computer software in diagnostic immunology
D6-Search literature for recent advances in clinical immunology
D7-Work effectively as a member of rheumatology team
D8-Develop presentation skills in immunology through laboratory meeting, seminars and multidisciplinary conferences

(3)Course content

1- Clinical Microbiology

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
1- Introduction to clinical microbioly					
Cell structure, physiology, metabolism and genetics	1		1		2
Classification of microbes	0.5		1		1.5
Introduction to viral infections	0.5		1		1.5
Introduction to fungal infections	0.5		1		1.5
Bacterial flora	0.5		1		1.5
Performance improvement in the Microbiology laboratory	1		1		2
Health and safety in Microbiology laboratory	1		1		2
Antimicrobial drugs • ***Classification*** • ***Mechanism of action***	1		2		3
Molecular diagnosis	2		3		5
Immunodiagnosis of infective syndromes	1		2		3
Disinfection and sterilization	1		1		2
Automation : principles of instruments used in microbiology lab	1.5		1		2.5
2-Lab. Identification of significant isolates :-					
Staphylococci.streptococci, enterococci and other catalase positive Gram positive cocci	1		2		3
Neisseria , Moraxella, Haemophilus and other fastidious Gram negative bacteria	1		2		3
Enterobacteracae	1		2		3
Vibrio , aeromonas, campylobacter and non fermentive Gram negative bacilli	1		2		3
Anaerobes	1		2		3
Chlamydia & Rickettsia	1		1		2
Mycoplasma and ureaplasma	1		1		2

3- Lab. diagnosis of infectious diseases :					
Upper and lower respiratory tract infections	1.5		2		3.5
Skin and soft tissue infections	1		2		3
Anaerobic infections	1		2		3
GIT and food poisoning	1		2		3
Infection of central nervous system	1		2		3
Bacteraemia and septicaemia	1		2		3
Urinary tract infections	1		2		3
Genital infections and sexually transmitted diseases	1.5		2		3.5
• ***Infection in special population :*** ***- In transplant patients*** ***-In children*** ***-In HIV patients*** ***-Opportunistic infections***	1.5		2		3.5
Ocular infections	1		2		3
Pyrexia of unknown origin	1		2		3
• ***Mycobacterial infection*** ***- Classification*** ***- Pathophysiology*** ***- Epidemiology*** ***- Multidrug resistance & its mechanism*** ***- Public health concern***	1.5		2		3.5
4-Clinical syndromes associated with viral infections	1		2		3
5- Fungal infections	2		3		5
Pathophysiology					
Transmission					
Clinical presentations					
Epidemiology					
Diagnosis (Superficial & deep) .					
Infection control					
Parasitic infections ***- Intestinal parasites*** ***- Tissue parasites*** ***- Blood parasites*** ***- Protozoa***	2		3		5

2- Clinical Immunology

Subjects	Lectur	Clinical	Laborato	Field	Total Teaching Hours
[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
R[illegible] D[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
M[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1		2		3
[illegible]	1.5		2		3.5
[illegible]	2		2		4
[illegible]	1.5		2		3.5
[illegible]	1.5		2		3.5
[illegible]	1.5		2		3.5
[illegible] R[illegible]	1.5		2		3.5

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(4) Teaching methods:

4.1 : Lectures

4.2 : Case study

4.3 : Practical Lab.

4.4 : Self-learning

4.5 : Student teaching

4.6 : Online teaching: https://youtu.be/oe0uGMpptN0 B lymphocyte

https://youtu.be/aD9gZQRoGyg T lymphocyte

https://youtu.be/PbLORz2NBS8 Cytokines

https://youtu.be/jdX2Pw6quY8 HLA

https://youtu.be/ERvEe3mtCcQ Mycobacterial infection

https://youtu.be/yHddThrw_oI Upper and lower respiratory tract infections

https://youtu.be/wHc1tgAdlXY Anaerobic infections

https://youtu.be/z7wR-WdW1Gw Chlamydia & Rickettsia & Mycoplasma and ureaplasma

https://youtu.be/I1z9fzTwBr8 Hypersensitivity

https://youtu.be/0MvYjCzmJtU Autoimmunity

https://youtu.be/uTplANsJwMk Fungal infection

https://youtu.be/XAzNgdgWAJU Infection of CNS

https://youtu.be/SkRdZgCsYVg Genital infections and sexually transmitted diseases https://youtu.be/ySByLLASfgU GIT and food poisoning

https://youtu.be/ONQF5y199Xc Immunodiagnosis of infective syndromes

https://youtu.be/kT67p8_stDw Introduction to viral infections

https://youtu.be/ZtfxsS6-jDI Ocular infections

4.7: Interactive sessions:

(5) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.

5.2: Oral exam for assessment of knowledge & intellectual skills.

5.3: Practical exam for assessment of practical and transferrable skills.

5.4: MCQ continuous assessment at the end of each semester

Percentage of each Assessment to the total mark:Written exam:40% (160 marks)
Practical exam: 25%(100 marks)Oral exam: 25%(100 marks)
MCQ exam: 10%(40 marks)

(6)References of the course:

6.1 : Text books:

A-DC Shanson. (2000). Microbiology in Clinical Practice (3rd ed). Butterworth-Heinemann.

B-Peakman M & Vergani D . (1997). Basic and Clinical Immunology. Elsevier Health Sciences

C- Gabriel Virella . (2019) Medical Immunology .CRC Press. in http://www.eshare-org.co.cc/2010/02/medical-immunology-6th-edition.html

D- Rich R, Fleisher T, Shearer W, Schroeder H, Frew A, Weyand C .(2018). Clinical Immunology Principles and Practice .(5th ed) .

F- Gladwin M, Trattler W, Mahan ES . (2013). Clinical Microbiology Made Ridiculously Simple (6th ed.). MedMaster.

6.2: Handbook: Amy L. Leber. (2016).Clinical Microbiology Procedures Handbook, (4th ed).Wiley online library.

. 6.3: Journals:

a-Journal of Clinical Microbiology.

b-Egyptian Journal of Immunology.

c-Journal of Immunology.

Course coordinator: Prof. Tarek Selim

Head of the department: Prof. Shereen Salah

COURSE
SPECIFICATION
Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Program offering the course:	**Postgraduate Master Degree in Clinical Pathology-CPATH 530**
(2) Department offering the program	**Clinical Pathology**
(3) Department responsible for teaching thecourse:	**Clinical Pathology**
(4) Part of the program	**Second Part (elective)**
(5) Date of approval by the Department`scouncil	6 / 4/ 2020
(6) Date of last approval of programspecification by Faculty council	20/9/2020
(7) Course title	**Laboratory Safety**
(8) Course code	**CPATH 530 LS**
(9) Credit hours	**1**
(10) Total teaching hours:	**15**

(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 student with the essential guidelines and attitudes for safe laboratory practice

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

A– Knowledge and Understanding

A1-Identify hazards related to handling chemicals, biologic specimens and radiologic materials

A2-Describe steps used as precautionary measures when working with electrical equipment, compressed gases, cryogenic materials and avoiding mechanical hazards associated with laboratory equipment

A3- Discuss safety awareness for clinical laboratory personnel

A4-List the responsibilities of employer and employee in providing a safe workplace

B– Intellectual skills

B1- Differentiate between different types of biologic safety cabinets

B2- Distinguish different classes of fires

B3- Use appropriate personal protective equipment when working in the clinical laboratory

B4- Apply safety guidelines in laboratory practice

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hour
General Safety Precautions	1				1
Safety guidelines and responsibility	1				1
Biologic safety	1				1
Chemical safety	1				1
Radiation safety	1				1
Fire safety	1				1
Electrical hazards	1				1
Compressed gas hazards	1				1
Cryogenic material hazards	1				1
Mechanical hazards	1				1
Chemical waste	1				1
Radioactive waste	1				1
Biohazardous waste	1				1
Accident documentation and investigation	2				2

(4) Teaching methods:4.1:

Lectures

4.2: Self-learning

4.3: Student teaching

4.4 Online teaching: https://youtu.be/iVxJdS1YXWw Fire safety & Electrical Hazards

https://youtu.be/rQM50RayNT8 Chemical waste

https://youtu.be/ilOoRwhPwxs General Safety Precautions & Biologic safety.

4.5: Interactive sessions.

(5) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.5.2: Oral exam for assessment of knowledge & intellectual skills.

5.3: MCQ continuous assessment at the end of each semester.

Percentage of each Assessment to the total mark:Written exam: 60% (36 marks)

Oral exam: 25% (15 marks)

MCQ exam: 15% (9 marks)

Total: 100% (60 marks)

(6) References of the course:

6.1:

A-Laboratory Safety Guidance 2011 in https://www.osha.gov/

B-Canadian Society of Medical Laboratory Science (CSMLS) Laboratory Safety Guidelines 8th Edition (2017)

c- LABORATORY HAZARDOUS WASTE MANAGEMENT MANUAL 2010 in https://shared.uoit.ca/.

D-Radiation Safety For Laboratory Workers 2017 in https://uwm.edu/.

6.2: Journals: American Society of Microbiology.
Clinical Pathology.

Course coordinator: Prof. Tarek Selim

Head of the department: Prof. Shereen Salah.

COURSE
SPECIFICATION
Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Program offering the course:	**Postgraduate Master Degree in Clinical Pathology-CPATH 530**
(2) Department offering the program	**Clinical Pathology**
(3) Department responsible for teaching thecourse:	**Clinical Pathology**
(4) Part of the program	**Second Part (elective)**
(5) Date of approval by the Department`scouncil	6/4 / 2020
(6) Date of last approval of programspecification by Faculty council	20/9/2020
(7) Course title	**Immune-based laboratory techniques**
(8) Course code	**CPATH 530 IBLT**
(9) Credit hours	**1**
(10) Total teaching hours:	**15**

(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 student with the necessary technical knowledge of laboratory techniques based on the phenomenon of antigen –antibody interactions

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

A– Knowledge and Understanding

A1-List factors influencing antigen-antibody interactions

A2-Recognize basic principles of flow cytometry

A3-Define chemiluminescence and bioluminescence

A4-Describe the principles of immunodiffusion and labeled immunoassay techniques

B– Intellectual skills

B1- Interpret flow cytometer data print out

B2- Use laboratory data for selection of proper donor for transplantation

B3- Employ the different patterns of immunelectrophoresis in clinical diagnosis

B4- Distinguish between different types of labeled immunoassays

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hour
Antigen- antibody interactions	1				1
Immunodiffusion techniques	1				1
Labeled immunoassay techniques	2				2
Immunoelectrophoresis	1.5				1.5
Chemiluminescence and bioluminescence	1				1
Automated immunoassay	1				1
Transplantation immunology work up	2				2
Autoantibodies detection by IF techniques	1				1
Automated autoantibodies detection	1				1
Immunoglobulin and complement detection	1				1
Flow cytometry: basic principles	1				1
Flow cytometry: clinical applications	1.5				1.5

(4) Teachingmethods:

4.1: Lectures

4.2: Self-learning

4.3: Student teaching

4.4 : Online teaching: https://youtu.be/qPRGTixAS6A Immunoelectrophoresis

https://youtu.be/7lDEBS2FJn0 Antigen- antibody interactions & Immunodiffusion techniques.

https://youtu.be/loXM-syMI-4 Chemiluminescence and bioluminescence

4.5: interactive sessions.

(5) Assessment methods:

5.1 : Written exam for assessment of knowledge & intellectual skills.

5.2 : Oral exam for assessment of knowledge & intellectual skills.

5.3 : MCQ continuous assessment at the end of each semester.

Percentage of each Assessment to the total mark:

Written exam:	60%	(36 marks)
Oral exam:	25%	(15 marks)
MCQ exam:	15%	(9 marks)
Total:	100%	(60 marks)

(6) References of the course:

6.1: Text books:

a- Burtis, Edward R Ashwood and DavidE Bruns . (2012) Tietz Textbook of Clinical Chemistry and Molecular Diagnostics(5th ed). Philadelphia: Elsevier Saunders,

b-Alice Longobardi Givan (2001) Flow Cytometry: First Principles, (2d ed):

Wiley-Liss, Inc

6.2: Journals: The Egyptian Journal of Immunology

a-Kumbala D, Zhang R. Essential concept of transplant immunology for clinical practice. World J Transplant. 2013;3(4):113-118. doi:10.5500/wjt.v3.i4.113

b- Cossarizza A, Chang HD, Radbruch A, Acs A, Adam D, Adam-Klages S, et al., Guidelines for the use of flow cytometry and cell sorting in immunological studies (second edition). Eur J Immunol. 2019 ;49(10):1457-1973. doi: 10.1002/eji.201970107. PMID: 31633216; PMCID: PMC7350392.

c- Betters DM. Use of Flow Cytometry in Clinical Practice. J Adv Pract Oncol. 2015;6(5):435-440. doi:10.6004/jadpro.2015.6.5.4

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Course coordinator: Prof. Tarek Selim

Head of the department: Prof. Shereen Salah

دكتوراة الباثولوجيا الإكلينيكية

PROGRAMME SPECIFICATION

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) **Programme Title & Code**	Postgraduate degree of Clinical Pathology–CPATH 630
(2) **Final award/degree**	Doctor degree
(3) **Department (s)**	Clinical Pathology Department
(4) **Coordinator**	Prof. Tarek Selim
(5) **External evaluator (s)**	Prof. Dr. Ola Sharaki Professor of Clinical PathologyFaculty of medicine, Alexandria University
(6) **Date of approval by the Department`s council**	6 / 4/ 2020
(7) **Date of last approval of programme specification by Faculty council**	20/9/2020

(B) Professional information

(1) Programme Aims:

The broad aims of the Programme are as follows:

O1- To provide the student with the basic characteristics and role of stem cels in disease pathogenesis and cell therapy

O2-To provide the student with the necessary knowledge on DNA and its role in pathogenesis and diagnosis of genetic diseases

O3-Provide the students with the basic knowledge essential for study and practice of hematology ,clinical chemistry, clinical microbiology and clinical immunology

O4-To provide the student with the technical knowledge, technical skills to perform laboratory tests in the field of hematology as well as interpretative skills of hematology laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

O5- To provide the student with the technical knowledge, technical skills to perform laboratory tests in the field of clinical chemistry as well as interpretative skills of the clinical chemistry laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

O6- To provide the student with the technical knowledge, technical skills to perform laboratory tests in the field of clinical microbiology as well as interpretative skills of the clinical microbiology laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

O7- To provide the student with the technical knowledge, technical skills to perform laboratory tests in the field of clinical immunology as well as interpretative skills of the clinical immunology laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

2- 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 sterilization 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

A15-Describe the causes, pathophysiology and clinical picture of various type of anemias

A16-Recognize the presentation, diagnosis and classification of acute and chronicleukemias

A17-Define the diagnostic criteria of different myeloproliferative neoplasms

A18 -Classify myelodysplasia according to WHO guidelines

A19-Discuss the classification, natural history and molecular biology of myeloma, Hodgkin and non- Hodgkin lymphomas

A20- Outline the etiology, presentation and methods of diagnosis of various acquired and congenital platelet, coagulation and thrombotic disorders.

A21- Discuss methods of laboratory monitoring of anticoagulants

A22- Identify different antigens expressed on red cells, platelets and neutrophils

A23- Recognize clinical, laboratory and medicolegal aspects of blood transfusion

A24- Outline the molecular basis of hemoglobinopathies, thalassemia, hemophilia and thrombophilia

A25- Recall the hematological aspects of various systemic diseases

A26- Describe hematology in pregnancy, newborn and aged population

A27- Classify vitamins, tumor markers and disorders of porphyrin metabolism

A28- Recognize the biochemistry, Physiology and metabolism of carbohydrates, lipids, proteins, minerals and trace elements.

A29- Discuss the physiological actions, tissue distribution and clinical significance of clinically relevant enzymes

A30- Describe biochemistry , physiology , metabolism and regulation of different endocrine and exocrine glands

A31- Explain laboratory assessment of maternal, fetal, pediatric and geriatric clinical chemistry disorders

A32- Identify the different classes of microbes and the major characters of infections caused by each class

A33- Describe the principles, advantages and disadvantages of different methods used in diagnosis of infective syndromes.

A34- Discuss the different mechanisms of antimicrobial resistance.

A35- Outline the principles and uses of sterilization and disinfection procedures

A36- Classify the biohazardous agents and its level of biosafety.

A37- List the different applications of nanotechnology in clinical microbiology.

A38-Outline the principles of autoimmunity and major autoimmune diseases

A39-List cytokines and chemokines

A40-Recognize the concepts of transplantation and tumor immunology and immune therapy

A41- Describe immune mediated reproductive, hematological, vascular and neurologicaldiseases

A42-Recognize basic DNA and gene structure

A43-Describe the principles of microbial genetics

A44-Define genomics and epigenetics

A45-Classify gene mutations and polymorphisms

A46-Identify the general characteristics of stem cell

A47-recognize the principles of immunogenetics of stem cell

A48-Describe the stem cell niche

A49-Define stem cell plasticity

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 microbiologicaldiagnosis

B13-Employ principles of molecular cell biology in immunology laboratory

B14-Use appropriate laboratory tests for assessment of immune competence

B15-Distinguish between various types of anemias based on laboratory results

B16-Interpret the results of appropriate laboratory methods to establish the diagnosis of acute and chronic leukemias

B17-Use appropriate laboratory methods to establish the dignosis of various myeloproliferative neoplasms

B18-Analyze the results of appropriate laboratory methods to establish the diagnosis of myelodysplastic syndromes

B19- Employ appropriate laboratory methods for diagnosis and staging of myeloma and determination of different types of lymphomas

B20-Interpret the results of laboratory screening tests for hemostasis and thrombophilia

B21- Use cut off points in cancer detection and reference values variations in different age groups

B22- Apply the American diabetes association definition for diagnosis of diabetes, NCEPP for the detection, evaluation and treatment of lipid disorders, guidelines f or interpretation of tumor markers , cardiac markers and thyroid profile in clinical chemistry practice .

B23- Interpret the functional laboratory tests that could be used in assessment of different endocrine system disorders

B24- Apply the different analytical methods used for monitoring of therapeutic drugs and drugs of abuse

B25- Apply the appropriate microbiological methods for diagnosis of each type of infection

B26- Interpret the results of different microbiological methods used in diagnosis of infections.

B27- Analyze the results of investigations made for hospital acquired infections.

B28- Employ the suitable antibiotic policy for each hospital.

B29- Use the suitable probiotics for treating different infections.

B30- Demonstrate the role of MHC and NK cell in immune response

B31-Use complement protein measurements to assess inherited and acquired immune deficiency states

B32-Apply the immunology laboratory tests for diagnosis of immune-mediated rheumatic, GIT, hepatobiliary and endocrine diseases

B33- Apply principles of immune modulating and gene therapy in clinical practice

B34- Use the molecular basis of cancer in clinical practiceB35- Interpret HLA molecular typing data

B36- Analyze genotype-phenotype relationship

B37- Distiguish different phases of cell cycle

B38- Demonstrate the role of leukemic stem cell in leukomogenesis

B39- Apply the principle of stem cell trans-differentiation in reparative medicine

B40- Distinguish various types of stem cells

B41- Use stem cell transplantation in disease management

C– Professional/practical skills

C1- Perform different hematological tests for diagnosis of anemias

C2- Carry out different hematological tests for diagnosis of acute and chronic leukemias

C3- Develop skills in preparation, staining and examination of peripheral blood and bone marrow smears

C4- Assess the results of cyto-chemical staining, immunophenotyping and cytogeneticstudies

C5- Evaluate the results generated by automated blood counters, platelet aggregometer and coagulation analyzers

C6- Perform blood grouping, cross matching and antiglobulin test

C7- Observe the performance of cytogenetic and molecular techniques

C8- Perform the analytical methods involved in diagnosis of different forms of diabetes , lipids , proteins, amino acids , minerals and trace elements disorders .

C9- Carry out the methods available for analysis of clinically significant enzymes

C10- Setup the clinical laboratory tests used to assess cardiac , kidney , liver, gastrointestinal , blood gases and electrolytes .

C11- Observe different molecular biological techniques relevant to diagnosis of clinical chemistry disorders

C12- Perform the different microbiological methods used in diagnosis of infections

C13- Be able to identify the different types of organisms

C14- Develop skills in operating the automated culture systems used for rapid microbiological diagnosis

C15- Be able to design a microbiology laboratory according to biosafety guidelines.

C16- Examine water and air for pollution.

C17- Apply the standard precautions of infection control in hospital.

C18-Assess neutrophil function

C19-Carry out immunoglobulin, complement proteins and cytokine assays

C20-Be able to detect different autoantibody markers

C21-Perform isolation of mononuclear cells using density gradient separation techniques

C22-Observe HLA typing by different methods

C23-Demonstrate the ability to write an informative laboratory report including a precise diagnosis, differential diagnosis, and recommended follow up or additional studies as appropriate

D– Communication & transferrable skills

D1- Search effectively electronic resources to find valid appropriate information and use them for evidence-based diagnostic practice

D2-Work effectively and cooperatively and demonstrate interpersonal skills in functioning as member of a multidisciplinary health care team .

D3-Demonstrate the ability to provide direct communication to the referring physician or appropriate clinical personnel when interpretation of a laboratory assay reveals an urgent , critical or unexpected finding and document this communication in an appropriate fashion

D4- Show compassion : be understanding and respectful of patients, their families, and the staff and physicians caring for them .

D5- Interact with others without discrimination based on religious , ethnic , sexual , or educational differences .

D6- Conduct individual presentations at multidisciplinary conferences that are focused, clear and concise

D7- Communicate with, consult and respect the role of other health care providers .

D8- Communicate ideas and arguments effectively,

D9- Manage time and resources and set priorities.

D10- Apply the principles of scientific research.

D11- Use simple statistical methods to analyze data. D12- Develop experience in the use of Web-based genomic databases

(3) Academic standards

Academic standards of the programme are attached in Appendix I in which NARS issued by the National Authority for Quality Assurance & Accreditation in Education are used. External reference points/Benchmarks are attached in Appendix II.

3.a- External reference points/benchmarks are selected to confirm the appropriatenessof the objectives, ILOs and structure of assessment of the programme:
(please list here the references and the website)

Michigan State University

http://www.michiganstateuniversityonline.com.

3.b- Comparison of the specification to the selected external reference/ benchmark: The aims of the Benchmark are covered by the current program.
There are differences in the credit hours and the timetable of the program.
About 85% of the topics of the benchmark are covered in our program.

(4) Curriculum structure and contents:

4.a- Duration of the programme : 6 Semesters

4.b- Programme structure:

Candidates should fulfill a total of …60…credit hours

- 4.b.1: Number of credit hours:

First part: 5 credit hours**Second part:**

- 25 credit hours: Lectures
- Practical training and others: 15 credit hour
  - Logbook including clinical training, workshops and training courses on diagnostic procedures, and other scientific activities (75% for attendance) .

Dissertation: 15 credit hours.

- 4.b.2: Teaching hours/week (15 weeks):

First part:

Lectures: 5 hours /week.

Second part:

Lectures: 8 hours /week.

practical: 4 hours/week. Total: 12 hours/week.

(5) Programme courses:

First part

a- Compulsory courses:

Course Title	Course Code	NO. of hours per week					Total teaching hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Basics of Clinical Pathology	**CPATH 630 BCP**	**5**				**5**	**75**	**A1-A14, B1-B14**

b- Elective courses:

None

Second part

a-Compulsory courses:

Course Title	Course Code	NO. of hours per week				Total teaching hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory/practical	Total		
		Lecture	Seminar				
Hematology	CPATH 630HE	8		4	12	240	A15-A26,B15-B20, C1 - C7- D1-D3
Clinical Chemistry	CPATH 630CC	8		4	12	240	A27-A31, B21-B24,C8-C11, D4-D7
Clinical Microbiology and immunology	CPATH 630CMI	8		4	12	240	A32-A41, B25-B33, C12-C23, D8-D12

b-Elective courses:

Principles of molecular genetics	CPATH 630PMG	1			1	15	A42-A45, B34-B37
Stem cells	CPATH 630 SC	1			1	15	A46-A49, B38-B41

Programme-Courses ILOs Matrix

Programme ILOs are enlisted in the first row of the table (by their code number: a1, a2……etc), then the course titles or codes are enlisted in first column, and an "x" mark is inserted where the respective course contributes to the achievement of the programme ILOs in question.

P.S. All courses` specifications are attached in Appendix III.

Programme ILOs

Course Title/Code	a1	a2	a3	a4	a5	a6	a7	a8	a9	a10	a11	a12	a13	a14	a15	a16	a17	a18	a19	a20	a21	a22	a23	a24	a25	a26	a27	a28	a29
Basic s of Clinical Pathology	×	×	×	×	x	x	x	x	x	x	x	x	x	x															
Hematology															x	x	x	x	x	x	x	x	x	x	x	x			
Clinical Chemistry																											x	x	x
Clinical microbiology and immunology																													
Principles of molecular genetics																													
Stem cells																													

Programme ILOs

Course Title/Code	a30	a31	a32	a33	a34	a35	a36	a37	a38	a39	a40	a41	a42	a43	a44	a45	a46	a47	a48	a49	aA50
Basic s of Clinical Pathology																					
Hematology																					
Clinical Chemistry	x	x																			
Clinical microbiology and immunology			x	x	x	x	x	x	x	X	x	x									
Principles of molecular genetics													x	x	x	x					
Stem cells																	x	x	x	x	

Programme ILOs

Course Title/Code	b1	b2	b3	b4	b5	b6	b7	b8	b9	b10	b11	b12	b13	b14	b15	b16	b17	b18	b19	b20	b21	b22	b23	b24	b25	b26	b27	b28	b29
Basic s of Clinical Pathology	×	×	×	×	x	x	x	x	x	x	x	x	x	x															
Hematology															x	x	x	x	x	x									
Clinical Chemistry																					x	x	x	x					
Clinical microbiology and immunology																									x	x	x	x	x
Principles of molecular genetics																													
Stem cells																													

Programme ILOs

Course Title/Code	b30	b31	b32	b33	b34	b35	b36	b37	b38	b39	b40	b41	b42	b43	b44	b45	b46	b47	b48
Basic s of Clinical Pathology																			
Hematology																			
Clinical Chemistry																			
Clinical microbiology and immunology	x	x	x	x															
Principles of molecular genetics					x	x	x	x											
Stem cells									x	x	x	x							

Programme ILOs

Course Title/Code	c1	c2	c3	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15	c16	c17	c18	c19	c20	c21	c22	c23	c24	c25	c26	c27	c28	c29
Basic s of Clinical Pathology																													
Hematology	x	x	x	x	x	x	x																						
Clinical Chemistry								x	x	x	x																		
Clinical microbiology and immunology												x	x	x	x	x	x	x	x	x	x	x	x						
Principles of molecular genetics																													
Stem cells																													

Programme ILOs

Course Title/Code	d1	d2	d3	d4	d5	d6	d7	d8	d9	d10	d11	d12	d13	d14	d15	d16	d17	d18	d19	d20	d21	d22	d23	d24	d25	d26	d27	d28	d29
Basic s of Clinical Pathology																													
Hematology	x	x	x																										
Clinical Chemistry				x	x	x	x																						
Clinical microbiology and immunology								x	x	x	x	x																	
Principles of molecular genetics																													
Stem cells																													

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(6) Programme admission requirements:

- **General requirements:**

According to the faculty postgraduate bylaws

- **Specific requirements (if applicable):**

None

(7) Regulations for progression and programme completion:

Students must complete a minimum of 60 credit hours in order to obtain the **MD.** degree, which includes the courses of the first and second parts, the thesis, and activities of the log book.

(8) Evaluation of Programme's intended learning outcomes (ILOs):

Evaluator	Tools*	Sample size
Internal evaluator **(s)** **Dr/ Hassan Abd El-GhaffarDr/ Kefaya El-Said** **Dr/ Hossam Zaghlool**	**Group discussion**	
External Evaluator (s) **Prof. Dr. Ola sharaky** **Professor of Clinical Pathology , Faculty of Medicine, Alexandria university**	**External evaluator checklistreport**	
Senior student **(s)**	**None**	
Alumni	**None**	
Stakeholder **(s)**	**None**	
others	**None**	

* TOOLS= QUESTIONNAIRE, INTERVIEW, WORKSHOP, COMMUNICATION, E_MAIL

We certify that all information required to deliver this programme is contained in the above specification and will be implemented. All course specification for this programme are in place.	
Programme coordinator: Name: **Prof. Tarek Selim**	Signature & date:
Dean: Name: **Prof. Nesrene Salah Omar**	Signature & date:
Executive director of the quality assurance unit: Name: **Prof. Nesrene Mohamed Shalaby**	Signature & date:

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`scouncil	6 / 4/ 2020
(6) Date of last approval of programspecification by Faculty council	20/9/2020
(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	Lecture	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 equipment*** ***- 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

4.4 : Online teaching: https://youtu.be/oe0uGMpptN0
https://youtu.be/aD9gZQRoGyg
https://youtu.be/qPRGTixAS6A
https://youtu.be/R8kg_nkDOY4
https://youtu.be/0vgkGuMMdx0
https://youtu.be/eUFtzrxSK_o
https://youtu.be/_OteQKzeuAI

(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 : Handbooks: Guide to Clinical Pathology

6.2: Textbook :

a-Sunheimer R, Graves L (2018) Clinical Laboratory Chemistry. (2nd Ed) Pearson

b- Kemal J. (2014). Laboratory Manual and Review on Clinical Pathology. OMICS Group eBooks

c- *Kaushansky K& Lichtman MA (*2016). WilliamsHematology(9th ed) .McGrawHill.https://archive.org/details/WilliamsHematology9thEditionMcGrawHill_201805

d- Wintrobe MM& Greer JP. (2018) Wintrobe's Clinical Hematology, (14th ed.). WoltersKluwer. .https://clarafranciosi.tumblr.com/.../wintrob es-clinical-hematology-14th-edition

e- Carl A Burtis, Edward R Ashwood and DavidE Bruns. (2012) .Tietz Textbook of Clinical Chemistry and Molecular Diagnostics(5th ed.). Philadelphia: Elsevier Saunders,

f- Carl A. Burtis, Edward R. Ashwood, and David E. Bruns. (2008). Tietz Fundamentals of Clinical Chemistry.(6th edition). St Louis, MO: Saunders/Elsevier.

g- Rich R, Fleisher T, Shearer W, Schroeder H, Frew A, Weyand C. (2018). Clinical Immunology Principles and Practice .(5th ed.) . Elsevier Health Sciences.

h- DC Shanson. (2000) Microbiology in Clinical Practice (3rd ed). Butterworth-Heinemann.

i- Gladwin M, Trattler W, Mahan ES . (2013). Clinical Microbiology Made Ridiculously Simple (6th ed.). MedMaster.

j- Gabriel Virella (2019). Medical Immunology(7th ed) .CRC Press, in http://www.eshare-org.co.cc/2010/02/medical-immunology-6th-edition.html

6.3: Journals:

a- Blood, Hematology, Egyptian Journal of Hematology.

b- Journal of Clinical Chemistry

c- Journal of Clinical Microbiology .

d- Egyptian Journal of Immunology

e- Journal of Immunology

f- Clinical Pathology.

- Course coordinator: Prof. / Tarek Selim
- Head of the department: Prof. / Shereen Salah
- Quality manager: Prof. Nesrene Mohamed Shalaby

- Dean: Prof Nesrene Salah Omar

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 thecourse	**Clinical Pathology Department**
(4) Part of the programme:	**Second part**
(5) Date of approval by the Department`scouncil	6 / 4/ 2020
(6) Date of last approval of programme specification by Faculty council	20/9/2020
(7) Course title:	**Hematology**
(8) Course code:	**CPATH 630HE** **CPATH 630 HEP**

(9) Credit hours	**CPATH 630HE (8)** **CPATH 630 HEP (4)**
(10) Total teaching hours:	**CPATH 630HE (120)** **CPATH 630 HEP (120)**

(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 :

To provide the student with the technical knowledge, technical skills to perform laboratory tests in the field of hematology as well as interpretative skills of hematology laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

(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-Describe the causes, pathophysiology and clinical picture of various type of anemias
A2-Recognize the presentation, diagnosis and classification of acute and chronic leukemiasA3-Define the diagnostic criteria of different myeloproliferative neoplasms
A4-Classify myelodysplasia according to WHO guidelines
A5-Discuss the classification, natural history and molecular biology of myeloma, Hodgkin and non- Hodgkin lymphomas
A6- Outline the etiology, presentation and methods of diagnosis of various acquired and congenital platelet , coagulation and thrombotic disorders.
A7- Discuss methods of laboratory monitoring of anticoagulants
A8- Identify different antigens expressed on red cells, platelets and neutrophils
A9- Recognize clinical, laboratory and medicolegal aspects of blood transfusion
A10- Outline the molecular basis of hemoglobinopathies, thalassemia, hemophilia and thrombophilia
A11- Recall the hematological aspects of various systemic diseases
A12- Describe hematology in pregnancy, newborn and aged population

B- Intellectual skills

B1-Distinguish between various types of anemias based on laboratory results
B2-Interpret the results of appropriate laboratory methods to establish the diagnosis of acute and chronic leukemias
B3-Use appropriate laboratory methods to establish the diagnosis of various myeloproliferativeneoplasms
B4-Analyze the results of appropriate laboratory methods to establish the diagnosis of myelodysplastic syndromes
B5- Employ appropriate laboratory methods for diagnosis and staging of myeloma and determination of different types of lymphomas
B6-Interpret the results of laboratory screening tests for hemostasis and thrombophilia

C-Professional/practical skills

C1- Perform different hematological tests for diagnosis of anemias
C2- Carry out different hematological tests for diagnosis of acute and chronic leukemias
C3- Develop skills in preparation, staining and examination of peripheral blood and bone marrow smears
C4- Assess the results of cyto-chemical staining, immunophenotyping and cytogenetic studiesC5- Evaluate the results generated by automated blood counters, platelet aggregometer and coagulation analyzers
C6- Perform blood grouping, cross matching and antiglobulin test
C7- Observe the performance of cytogenetic and molecular techniques

D- Communication & Transferable skills

D1- Search effectively electronic resources to find valid appropriate information and use them for evidence-based diagnostic practice

D2-Work effectively and cooperatively and demonstrate interpersonal skills in functioning as member of a multidisciplinary health care team .

D3-Demonstrate the ability to provide direct communication to the referring physician or appropriate clinical personnel when interpretation of a laboratory assay reveals an urgent , critical or unexpected finding and document this communication in an appropriate fashion

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
General aspects of anemia	1.5		1.5		3
Iron-deficiency anemia	1.5		15		3
Iron refractory iron deficiency anemia	1.5		1.5		3
Iron overload	1.5		1.5		3
Anemia of chronic disease	1.5		1.5		3
Sideroblastic anemia	1.5		1.5		3
Hematological aspects of porphyria	1.5		1.5		3
Phenotype diversity of thalassemia and sickle cell anemia	1.5		1.5		3
Pre-implantation and prenatal diagnosis of thalassemia syndrome	1.5		1.5		3
Molecular techniques used in diagnosis of thalssemia syndrome	1.5		1.5		3
Molecular basis of thalassemia	1.5		1.5		3
Macrocytic anemias	1.5		1.5		3
General aspects of hemolytic anemias	1.5		1.5		3
Red cell membranopathies	1.5		1.5		3
Red cell enzymopathies	1.5		1.5		3
Hemoglobinopathies	1.5		1.5		3
Immune hemolytic anemias	1.5		1.5		3
Non-immune hemolytic anemias	1.5		1.5		3
Paroxysmal nocturnal hemoglobinuria	1.5		1.5		3
Microangiopathic hemolytic anemias	1.5		1.5		3
Aplastic anemia and Pure red cell aplasia	1.5		1.5		3
Congenital dyserthropoietic anemias	1.5		1.5		3
Pancytopenia	1.5		1.5		3
Stem cell transplantation	1.5		1.5		3
Benign disorders of granulocytes	1.5		1.5		3

Benign disorders of lymphocytes	1.5		1.5		3
Mononucleosis syndrome	1.5		1.5		3
Benign disorders of monocytes	1.5		1.5		3
Disorders of macrophages	1.5		1.5		3
Hypersplenism and hyposplenism	1		1		2
Oncogenesis	1.5		1.5		3.5
Cancer stem cell	1.5		1.5		3
Cytogenetics of hematological malignancies	1.5		2		3.5
Molecular genetics of hematological malignancies	1.5		2		3.5
Acute lymphoblastic leukemia	1.5		1.5		3
Acute myeloid leukemia	1.5		2		3.5
Myelodysplasia	1.5		1.5		3
Chronic myeloid leukemia	1.5		2		3.5
Polycythemia	1.5		1.5		3
Myelofibrosis	1.5		1.5		3
Primary thrombocythemia	1.5		1.5		3
Chronic lymphocytic leukemias	1.5		1.5		3
Hodgkin`s lymphoma	1.5		1.5		3
Non Hodgkin`s lymphoma	1.5		1.5		3
Multiple myeloma	1.5		2		3.5
Essential monoclonal gammopathy	1.5		1.5		3
Macroglobulinemia	1.5		1.5		3
Heavy chain disease	1.5		1.5		3
Free immunoglobulin light chain	1.5		1.5		3
Amyloidosis	1.5		1.5		3
Angiogenesis	1.5		1.5		3
Vascular purpuras	1.5		1.5		3
Thrombocytopenia	1.5		1.5		3

Thrombocytosis	1.5		2		3.5
Hereditary qualitative platelet disorders	1.5		1.5		3
Acquired qualitative platelet disorders	1.5		1.5		3
Hemophilias	1.5		1.5		3
Molecular genetics of hemophilia	1.5		1.5		3
vonWillebrand's disease	1.5		1.5		3
Acquired coagulopathies	1.5		1.5		3
Circulating inhibitors of coagulation	1.5		1.5		3
Hereditary thrombophilia	1.5		1.5		3
Molecular genetics of thrombophilia	1.5		1.5		3
Acquired thrombophilia	1.5		1.5		3
Antiphospholipid syndrome	1.5		1.5		3
Thrombotic microangiopathies	1.5		1.5		3
Antithrombotic therapy	1.5		1.5		3
Red cell antigens and antibodies	1.5		1.5		3
Leukocytes and platelet antigen and antibodies	1.5		1.5		3
Blood components therapy	2		1.5		3.5
Complications of blood transfusion	2		1.5		3.5
Autologous blood transfusion	1.5		1.5		3
Hematologic aspects of systemic diseases	2		1.5		3.5
Therapeutic apharesis	2		1.5		3.5
Blood alternatives	1.5		1.5		3
Hematology in pregnancy	2		1.5		3.5
Neonatal hematology	2		1.5		3.5
Geriatric hematology	2		1.5		3.5

(4) Teaching methods:

4.1: Lectures

4.2: Case study

4.3: Practical Lab

4.4: Self learning

4.5: Student teaching

4.6: online teaching

4.7: interactive sessions.

(5) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.5.2: Oral exam for assessment of knowledge & intellectual skills.

5.3: Practical exam for assessment of practical skills.

5.4: MCQ continuous assessment at the end of each semester

Percentage of each Assessment to the total mark:Written exam: 26.66% (80 marks)

Practical exam: 33.33% (100 marks)

Oral exam: 33.33% (100 marks)

MCQ exam: 6.66% (20 marks)

(6)References of the course:

6.1: Hand books:

Barbara J. Bain, Imelda Bates, Mike A Laffan(2017).

Dacie and Lewis Practical Haematology(12 th ed.) . Elsevier Health Sciences.

6.2: Text books:

*a-Kaushansky K& Lichtman MA (*2016). WilliamsHematology(9th ed) .McGrawHill.https://archive.org/details/Willi

amsHematology9thEditionMcGrawHill_201
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b- Wintrobe MM& Greer JP. (2018)
Wintrobe's Clinical Hematology, (14th ed.).
WoltersKluwer.
.https://clarafranciosi.tumblr.com/.../wintrob
es-clinical-hematology-14th-edition

6.3: Journals: Blood, Hematology , Egyptian J of Hematology

- Course coordinator: Prof. / Tarek Selim
- Head of the department: Prof. / Shereen Salah
- Quality manager: Prof. Nesrene Mohamed Shalaby

- Dean: Prof Nesrene Salah Omar

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 thecourse:	**Clinical Pathology Department**
(4) Part of the program:	**Second Part**
(5) Date of approval by the Department`scouncil	6/4 / 2020
(6) Date of last approval of programspecification by Faculty council	20/9/2020
(7) Course title:	**Clinical Chemistry**
(8) Course code:	**CPATH 630CC** **CPATH 630 CCP**
(9) Credit hours	**CPATH 630CC (8)** **CPATH 630 CCP (4)**
(10) Total teaching hours:	**CPATH 630CC (120)** **CPATH 630 CCP(120)**

(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 student with the technical knowledge, technical skills to perform laboratory tests in the field of clinical chemistry as well as interpretative skills of the clinical chemistry laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be derived from data.

(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 - Classify vitamins, tumor markers and disorders of porphyrin metabolism
A2- Recognize the biochemistry, Physiology and metabolism of carbohydrates, lipids, proteins, minerals and trace elements.
A3- Discuss the physiological actions, tissue distribution and clinical significance of clinically relevant enzymes
A4- Describe biochemistry , physiology , metabolism and regulation of different endocrine and exocrine glands
A5- Explain laboratory assessment of maternal, fetal, pediatric and geriatric clinical chemistry disorders

B- Intellectual skills

B1- Use cut off points in cancer detection and reference values variations in different age groups

B2- Apply the American diabetes association definition for diagnosis of diabetes, NCEPP for the detection, evaluation and treatment of lipid disorders, guidelines for interpretation of tumor markers, cardiac markers and thyroid profile in clinical chemistry practice.

B3- Interpret the functional laboratory tests that could be used in assessment of different endocrine system disorders

B4- Apply the different analytical methods used for monitoring of therapeutic drugs and drugs of abuse

C- Professional/practical skills

C1- Perform the analytical methods involved in diagnosis of different forms of diabetes, lipids , proteins, amino acids, minerals and trace elements disorders.

C2- Carry out the methods available for analysis of clinically significant enzymes

C3- Setup the clinical laboratory tests used to assess cardiac, kidney, liver, gastrointestinal, blood gases and electrolytes.

C4- Observe different molecular biological techniques relevant to diagnosis of clinical chemistry disorders

D- Communication & Transferable skills

D1- Show compassion: be understanding and respectful of patients, their families, and the staff and physicians caring for them.

D2- Interact with others without discrimination based on religious, ethnic, sexual, or educational differences.

D3- Conduct individual presentations at multidisciplinary conferences that are focused, clear and concise

D4- Communicate with, consult and respect the role of other health care providers.

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
Carbohydrate homeostasis	2		2		4
DM pathogenesis, C/P complications & diagnosis (Updates)	2		2		4
Classification of lipids & lipid metabolism	2		2		4
Cardiovascular risk factors	2		2		4
Metabolic syndrome	2		2		4
Amino acids classification and metabolism	2		2		4
Protein structure & metabolism	2		2		4
Acute phase proteins	2		2		4
Inborn error of metabolism I	2		2		4
Inborn error of metabolism II	2		2		4
Inborn error of fatty acids and organic acids metabolism	2		2		4
Physiology of normal renal functions & Glomeruler & tubular function tests	2		2		4
Chemical pathology of renal disorders	2		2		4
Water homeostasis & related factors	2		2		4
Electrolyte balance, electrolyte disturbance and there assay	2		2		4
Acid base balance disorders	2		2		4
Physiology of liver function & Liver function tests	2		2		4
Chemical pathology of hepatic disorders	2		2		4
Gastric function tests and gastric diseases	2		2		4
Exocrine pancreatic function tests & pancreatic diseases	2		2		4
Intestinal function tests & malabsorbtion syndromes	2		2		4
Cardiac function study	2		2		4
Diagnosis of ischemic heart diseases	2		2		4

Rule of laboratory in diagnosis & follow up of heart failure & hypertension	2		2		4
Clinical enzymology I	2		2		4
Clinical enzymology II	2		2		4
Clinical enzymology III	2		2		4
Ca homeostasis & assay	2		2		4
Phosphorous & Mg disorders & assay	2		2		4
Markesr of bone turnover	2		2		4
Vitamin assessment	2		2		4
Multiple endocrine neoplasm	2		2		4
Trace element assessment	2		2		4
Nutrition and obesity	2		2		4
Biochemical Tumor markers	2		2		4
Hypothalamo-pituitary unit	2		2		4
Hypothalamo-pituitary adrenal axis	2		2		4
Hypothalamo-pituitary thyroid axis	2		2		4
Pancreatic hormones	2		2		4
Reproductive related disorders	2		2		4
Clinical chemistry of pregnancy & fetal monitoring	2		2		4
Assessment of porphyrins and disorders of porphyrin metabolism Iron homeostasis	2		2		4
Clinical chemistry of pediatric	2		2		4
Clinical chemistry of geriatric	2		2		4
Adipose tissue as an endocrine organ	2		2		4
Applications of molecular biology in clinical chemistry	2		2		4
Microarray in clinical chemistry	2		2		4
Therapeutic drug monitoring	2		2		4
Updates in Clinical Chemistry	24		24		48

- ***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***					

(4) Teaching methods:

4.1 : Lectures

4.2 : Case study

4.3 : Practical Lab

4.4 : Self learning

5.4: Student teaching

5.5: Online teaching: https://youtu.be/zDLuaD_qmE0

https://youtu.be/tw7L3pI0DPg

(5) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.

5.2: Oral exam for assessment of knowledge, intellectual & communication skills.5.3: Practical exam for assessment of practical skills.

5.4: MCQ continuous assessment at the end of each semester

Percentage of each Assessment to the total mark:

Written exam: 26 . 66% (80)

Practical exam: 33 . 33% (100)

Oral exam: 33 . 33% (100)

MCQ exam: 6 . 66% (20)

(6) References of the course:

6.1 : Hand books: Guide to Clinical Pathology

6.2 : Text books:

a- Burtis, Edward R Ashwood and DavidE Bruns . (2012) Tietz Textbook of Clinical Chemistry and Molecular Diagnostics(5th ed). Philadelphia: Elsevier Saunders,

b- Carl A. Burtis, Edward R. Ashwood, and David E. Bruns . (2008).Tietz Fundamentals of Clinical Chemistry, (6th ed.). St Louis, MO: Saunders/Elsevier.

c- Melmed S, Koenig R, Rosen C, Auchus R, Goldfine A. (2019)Williams Textbook of Endocrinology (14th ed). Elsevier .eBook ISBN: 9780323711548

- d- Sunheimer R , Graves L (2018)Clinical Laboratory Chemistry. (2nd Ed) Pearson
-

6.3: Journals:a- Journal of Clinical Chemistry.
b- Clinical Pathology

- Course coordinator: Prof. / Tarek Selim
- Head of the department: Prof. / Shereen Salah

- Quality manager: Prof. Nesrene Mohamed Shalaby

COURSE SPECIFICATION

(A) Faculty of Medicine– Mansoura UniversityAdministrative 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 thecourse:	**Clinical Pathology Department**
(4) Part of the program:	**Second part**
(5) Date of approval by the Department`scouncil	6-4-2020
(6) Date of last approval of programspecification by Faculty council	20/9/2020
(7) Course title:	**Clinical Microbiology and Immunology**
(8) Course code:	**CPATH 630CMI** **CPATH 630CMIP**
(9) Credit hours	**CPATH 630CMI (8)** **CPATH 630CMIP (4)**
(10) Total teaching hours:	**CPATH 630CMI (120)** **CPATH 630CMIP (120)**

(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 student with the technical knowledge, technical skills to perform laboratory tests in the fields of clinical microbiology and clinical immunology as well as interpretative skills of the clinical microbiology and clinical immunology laboratory data and communication skills with the referring clinicians and other health care providers so that a clinically useful opinion can be

(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- Identify the different classes of microbes and the major characters of infections caused by each class
A2- Describe the principles, advantages and disadvantages of different methods used in diagnosis of infective syndromes.
A3- Discuss the different mechanisms of antimicrobial resistance.
A4- Outline the principles and uses of sterilization and disinfection procedures
A5- Classify the biohazardous agents and its level of biosafety.
A6- List the different applications of nanotechnology in clinical microbiology.
A7-Outline the principles of autoimmunity and major autoimmune diseases
A8-List cytokines and chemokines
A9-Recognize the concepts of transplantation and tumor immunology and immune therapy
A10 - Describe immune mediated reproductive, hematological, vascular and neurologial diseases

B- Intellectual skills

B1- Apply the appropriate microbiological methods for diagnosis of each type of infection
B2- Interpret the results of different microbiological methods used in diagnosis of infections.
B3- Analyze the results of investigations made for hospital acquired infections.
B4- Employ the suitable antibiotic policy for each hospital.
B5- Use the suitable probiotics for treating different infections.
B6- Demonstrate the role of MHC and NK cell in immune response
B7-Use complement protein measurements to assess inherited and acquired immune deficiency states
B8-Apply the immunology laboratory tests for diagnosis of immune-mediated rheumatic, GIT, hepatobiliary and endocrine diseases
B9- Apply principles of immune modulating and gene therapy in clinical practice

C- Professional/practical skills

C1- Perform the different microbiological methods used in diagnosis of infections
C2- Be able to identify the different types of organisms
C3- Develop skills in operating the automated culture systems used for rapid microbiological diagnosis
C4- Be able to design a microbiology laboratory according to biosafety guidelines.
C5- Examine water and air for pollution.
C6- Apply the standard precautions of infection control in hospital.
C7-Assess neutrophil function
C8-Carry out immunoglobulin, complement proteins and cytokine assays
C9-Be able to detect different autoantibody markers
C10-Perform isolation of mononuclear cells using density gradient separation techniques
C11-Observe HLA typing by different methods
C12-Work well with medical technologists in continuing education settings and in the day to day laboratory environment
C13-Demonstrate the ability to write an informative laboratory report including a precise diagnosis, differential diagnosis, and recommended follow up or additional studies as appropriate

D- Communication & Transferable skills

D1- Communicate ideas and arguments effectively,
D2- Manage time and resources and set priorities.
D3- Apply the principles of scientific research.
D4- Use simple statistical methods to analyze data.
D5 - Develop experience in the use of Web-based genomic databases

(3) Course content:

1- Clinical Microbiology

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
1- Introduction to clinical microbiology					
Cell structure, physiology, metabolism and genetics	1		1		2
Classification of microbes	1		1		2
Introduction to viral infections	1		1		2
Introduction to fungal infections	1		1		2
Bacterial flora	1		1		2
Performance improvement in the Microbiology laboratory	1		1		2
• Antimicrobial drugs ***- Classification*** ***- Mechanism of action***	1		1		2
Molecular diagnosis	1		1		2
Immunodiagnosis of infective syndromes	1		1		2
Disinfection and sterilization	1		1		2
Automation : principles of instruments used in microbiology lab.	1		1		2
*** Lab. Identification of significant isolates :-**					
Staphylococci.streptococci, enterococci and other catalase positive Gram positive cocci	1		1		2
Neisseria , Moraxella, Haemophilus and other fastidious gram negative Bacteria	1		1		2
Enterobacteracae	1		1		2
Vibrio , aeromonas, campylobacter and and Non fermentive Gram negative bacilli	1		1		2
Anaerobes	1		1		2
Chlamydia & Rickettsia	1		1		2
Mycoplasma and ureaplasma	1		1		2
3- Lab. diagnosis of infectious					

diseases :					
Upper and lowe respiratory tract infections1.5	1.5		1.5		3
Skin and sof1.5t tissue infections	1.5		1.5		3
Anaerobic infections	1.5		1.5		3
GIT and food poisoning	1.5		1.5		3
Infection of central nervous system	1.5		1.5		3
Bacteraemia and septicaemia	1.5		1.5		3
Urinary tract infections	1.5		1.5		3
Genital infections and sexually transmitted diseases	1.5		1.5		3
• Infection in special population: ***- In transplant patients*** ***- In children*** ***- In HIV patients*** ***- Opportunistic infection***	1.5		1.5		3
Occular infections	1.5		1.5		3
Pyrexia of unknown origin	1.5		1.5		3
• Mycobacterial infection ***- Classification*** ***- Pathophysiology*** ***- Epidemiology*** ***- Multidrug resistance & its mechanism*** ***- Public health concern***	1.5		1.5		3
4-Clinical syndromes associated with viral infections	1.5		1.5		3
5- Fungal infections ***- Pathophysiology*** ***- Transmission*** ***- Clinical presentations*** ***- Epidemiology*** ***- Diagnosis (Superficial & deep) .***	1.5		1.5		3
Infection control	1.5		1.5		3
Parasitic infections ***- Intestinal parasites*** ***- Tissue parasites*** ***- Blood parasites***	1.5		1.5		3

- Protozoa					
**** Biofilm***	1.5		1.5		3
**** Host – parasite interrelationship***	1.5		1.5		3
**** Antimicrobial drug resistance &mobile genetic elements***	1.5		1.5		3
**** Probiotics***	1.5		1.5		3
**** Bioterrorism***	1.5		1.5		3
**** Biohazard and Biosafety***	1.5		1.5		3
Air and water pollution ***- Testing of quality*** ***- related Biohazards***	1.5		1.5		3
**** Nanotechnology in clinical microbiology***	1.5		1.5		3
**** Emerging pathogens***	1.5		1.5		3
**** Infection control guidelines***	1.5		1.5		3
**** Public health principles and interrelation between diagnostic lab. and public health agencies***	1.5		1.5		3
**** Chronic fatigue syndrome (Microbiological causes)***	1.5		1.5		3

2- Clinical Immunology

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hours
Introduction to Immune System	1		1		2
Immune response part I	1		1		2
Immune response part II	1		1		2
Innate Immunity Part I	1		1		2
Innate Immunity Part II1	1		1		2
Antigen and Immunogen	1		1		2
T-lymphocytes & Tregs1	1		1		2
B-lymphocytes1	1		1		2
Immunoglobuli1n	1		1		2
Receptor Divers1ity	1.5		1.5		3
NK and KIR1	1.5		1.5		3
Antigen-presenting cell , Ag processing and presentation	1.5		1.5		3
Complement system	1.5		1.5		3
Major histocompatibility complex	1.5		1.5		3
Histocompatibility testing	1.5		1.5		3
Cytokines	1.5		1.5		3
Chemokines	1.5		1.5		3
Tolerance & Autoimmunity	1.5		1.5		3
Evaluation of Immune-competence	1.5		1.5		3
Immunodeficiency syndromes Part I	1.5		1.5		3
Immunodeficiency syndromes Part II	1.5		1.5		3
Hypersensitivity Part I	1.5		1.5		3
Hypersensitivity Part II	1.5		1.5		3
Immune-mediated Rheumatic diseases Part I	1.5		1.5		3
Immune-mediated Rheumatic diseases Part II	1.5		1.5		3
Immune-mediated GIT& Hepatobiliary diseases	1.5		1.5		3

Immune-mediated Endocrine dis.	1.5		1.5		3
Tumor Immunology	1.5		1.5		3
Transplant Immunology Part I	1.5		1.5		3
Transplant Immunology Part II	1.5		1.5		3
Stem cell transplant	1.5		1.5		3
Immunologic therapy	1.5		1.5		3
Reproduction and immune system	1.5		1.5		3
Immune-mediated hematologic diseases	1.5		1.5		3
Inflammation	1.5		1.5		3
Mucosal Immunity	1.5		1.5		3
Immune-mediated vascular disease	1.5		1.5		3
Immune-mediated neurologic disease	1.5		1.5		3
Immune modulating therapy	1.5		1.5		3
Gene therapy	1.5		1.5		3
Cell cycle kinetics	1.5		1.5		3
Introduction to molecular biology	1.5		1.5		3
Molecular biology in immunology	1.5		1.5		3

(4) Teaching methods:

4.1：Lectures

4.2：Case study

4.3：Practical Lab

4.5: Self learning

4.6: Student teaching

4.7：Online teaching: https://youtu.be/oe0uGMpptN0 B lymphocyte

https://youtu.be/aD9gZQRoGyg T lymphocyte

https://youtu.be/PbLORz2NBS8 Cytokines

https://youtu.be/jdX2Pw6quY8 HLA

https://youtu.be/eUFtzrxSK_o Molecular diagnosis & Introduction to molecular biology.

https://youtu.be/ERvEe3mtCcQ Mycobacterial infection

https://youtu.be/yHddThrw_oI Upper and lower respiratory tract infections

https://youtu.be/wHc1tgAdlXY Anaerobic infections

https://youtu.be/z7wR-WdW1Gw Chlamydia & Rickettsia & Mycoplasma and ureaplasma

https://youtu.be/gCaN53Svw1g Tumor Immunology

https://youtu.be/aMFGYc30jqM Immunodeficiency

https://youtu.be/X4EqxveiUnk Tolerance & Autoimmunity

https://youtu.be/VVEsmambqkY Immunoglobulin

https://youtu.be/I1z9fzTwBr8 Hypersensitivity

https://youtu.be/0MvYjCzmJtU Autoimmunity

https://youtu.be/uTplANsJwMk Fungal infection

https://youtu.be/XAzNgdgWAJU Infection of CNS

https://youtu.be/SkRdZgCsYVg Genital infections and sexually transmitted diseases

https://youtu.be/ySByLLASfgU GIT and food poisoning

https://youtu.be/ONQF5y199Xc *Immunodiagnosis of infective syndromes*

https://youtu.be/kT67p8_stDw *Introduction to viral infections*

https://youtu.be/ZtfxsS6-jDI *Ocular infections*

4.8: Interactive sessions

(5) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.

5.2: Oral exam for assessment of knowledge, intellectual & communication skills.5.3: Practical exam for assessment of practical skills.

5.4: MCQ continuous assessment at the end of each semester.

Percentage of each Assessment to the total mark:Written exam: 26.66% (80 marks)

Practical exam: 33.33% (100 marks)

Oral exam: 33.33% (100 marks)

MCQ exam: 6.66% (20 marks)

(6) References of the course:

6.1: Hand books: Guide to Clinical Pathology

6.2: Text books:

A-DC Shanson. (2000) Microbiology in Clinical Practice (3rd ed). Butterworth-Heinemann.

B-Peakman M & Vergani D . (1997) Basic and Clinical Immunology. Elsevier Health Sciences

C- Gabriel Virella . (2019) Medical Immunology .CRC Press. in http://www.eshare-org.co.cc/2010/02/medical-immunology-6th-edition.html

D- Rich R, Fleisher T, Shearer W, Schroeder H, Frew A, Weyand C .(2018). Clinical Immunology Principles and Practice. (5th ed) .

E-Amy L. Leber. (2016). Clinical Microbiology Procedures Handbook, (4th ed).Wiley online library.

F- Gladwin M, Trattler W, Mahan ES

. (2013). Clinical Microbiology Made Ridiculously Simple
(6th ed.). MedMaster.

.6.3: Journals:

a-Journal of Clinical Microbiology.

b-Egyptian Journal of Immunology.

c-Journal of Immunology.

- Course coordinator: Prof. / Tarek Selim
- Head of the department: Prof. / Shereen Salah
- Quality manager: Prof. Nesrene Mohamed Shalaby
- Dean: Prof Nesrene Salah Omar

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**
(3) Department responsible for teaching thecourse:	**Clinical Pathology**
(4) Part of the program	**Second Part (elective)**
(5) Date of approval by the Department`scouncil	6 / 4/ 2020
(6) Date of last approval of programspecification by Faculty council	20/9/2020
(7) Course title	**Stem cells**
(8) Course code	**CPATH 630 SC**
(9) Credit hours	**1**
(10) Total teaching hours:	15

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 student with the basic characteristics and role of stem cells in disease pathogenesis and therapy

(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-Identify the general characteristics of stem cell

A2-recognize the principles of immunogenetics of stem cell

A3-Describe the stem cell niche

A4-Define stem cell plasticity

B- Intellectual skills

B1- Demonstrate the role of leukemic stem cell in leukemogenesis

B2- Apply the principle of stem cell trans-differentiation in reparative medicine

B3- Distinguish various types of stem cells

B4- Use stem cell transplantation in disease management

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hour
Stem cell: General issues	1.5				1.5
Stem cell separation	2				2
Stem cell culture	2				2
Stem cell niche	1.5				1.5
Immunogenetics of stem cells	2				2
Cancer stem cell and leukemicstem cell	2				2
Stem cell transplantation	2				2
Stem cell plasticity	2				2

(4) Teaching methods:

4.1: Lectures

4.2: Self-learning

4.3: Student teaching

4.4: Interactive sessions

4.5: Online teaching

(5) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.

5.2: Oral exam for assessment of knowledge, intellectual & communication skills.

5.3: MCQ continuous assessment at the end of each semester.

Percentage of each Assessment to the total mark:

Written exam: 60%(24 marks)

Oral exam: 25%(10 marks)

MCQ exam: 15%(6 marks)

Total : 100% (40 marks)

(6) References of the course:

- 6.1: Text books: Linza R, Klimanskaya I (2008). Essential stem cell methods: reliable laboratory solution.(1st ed) In https://www.booksdeal.com/products/essential-stem-cell-methods.

6.2: Journals: Blood

6.3: Bari, S., Seah, K. K. H., Poon, Z., Cheung, A. M. S., Fan, X., Ong, S. Y., & Hwang, W. Y. K. (2015). Expansion and homing of umbilical cord blood hematopoietic stem and progenitor cells for clinical transplantation. Biology of Blood and Marrow Transplantation, 21(6), 1008-1019.

6.4: Buyl, K., Vanhaecke, T., Desmae, T., Lagneaux, L., Rogiers, V., Najar, M., & De Kock, J. (2015). Evaluation of a new standardized enzymatic isolation protocol for human umbilical cord-derived stem cells. Toxicology in vitro, 29(6), 1254-1262.

6.5: Dzierzak, E., & Bigas, A. (2018). Blood development: hematopoietic stem cell dependence and independence. Cell Stem Cell, 22(5), 639-651.
6.6: Fei, X., Jiang, S., Zhang, S., Li, Y., Ge, J., He, B., ... & Ruiz, G. (2013). Isolation, culture, and identification of amniotic fluid-derived mesenchymal stem cells. Cell biochemistry and biophysics, 67(2), 689-694
6.7: George, J., Manjusha, W. A., Jegan, S. R., Mahija, S. P., & Josphin, J. S. (2017). A Review of Stem Cells in Regenerative Medicine. Science and Technology, 3(8), 806-815.

Course coordinator: Prof. Tarek Selim

Head of the department: Prof. Shereen Salah

Quality manager: Prof. Nesrene Mohamed Shalaby

Dean: Prof. Nesrene Salah Omar

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**
(3) Department responsible for teaching thecourse:	**Clinical Pathology**
(4) Part of the program	**Second Part (elective)**
(5) Date of approval by the Department`scouncil	**15 – 6 - 2016**
(6) Date of last approval of programspecification by Faculty council	9/8/2016
(7) Course title	**Principles of molecular genetics**
(8) Course code	**CPATH 630 PMG**
(9) Credit hours	**1**
(10) Total teaching hours:	15

(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 student with the necessary knowledge on DNA and its role in pathogenesis and diagnosis of genetic diseases

(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 basic DNA and gene structure

A2-Describe the principles of microbial genetics

A3-Define genomics and epigenetics

A4-Classify gene mutations and polymorphisms

B- Intellectual skills

B1- Use the molecular basis of cancer in clinical

practiceB2- Interpret HLA molecular typing data
B3- Analyze genotype-phenotype relationship

B4- Distinguish different phases of cell cycle

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Teaching Hour
Basic DNA structure	1				1
Gene structure and expression	1				1
Methods of DNA analysis	1.5				1.5
Gene mutations	1.5				1.5
Gene polymorphisms	1				1
The cell cycle	1.5				1.5
Molecular basis of Cancer	1.5				1.5
DNA-based HLA typing	1.5				1.5
Microbial genetics	1.5				1.5
Microbial phylogenetic analysis	1.5				1.5
Human Genome project, genomics & epigenetics	1.5				1.5

(4) Teaching methods:

4.1: Lectures

4.2: Self-learning

4.3: Student teaching.

4.4: Interactive sessions

4.5: Online teaching

(5) Assessment methods:

5.1: Written exam for assessment of knowledge & intellectual skills.

5.2: Oral exam for assessment of knowledge, intellectual & communication skills.

5.3: MCQ continuous assessment at the end of each semester.

Percentage of each Assessment to the total mark:Written exam: 60% (24marks)

Oral exam: 25% (10 marks)

MCQ exam: 15 % (6 marks)

Total : 100 % (40 marks)

(6)References of the course:

6.1: Text books:

a- *Kaushansky K& Lichtman MA* 2016. WilliamsHematology(9th ed) .McGrawHill.

b- Khush. G. S.(2015). Essentials of Molecular Genetics. Alpha Science International.

c-Hartl D L. Jones EW. (2005) Genetics: Analysis of genes and genomes. Jones and Bartlett Publishers

6.2: Journals:

a-.Quail DF, Joyce JA. Microenvironmental regulation of tumor progression and metastasis. Nat Med. 2013;19(11):1423-37. doi: 10.1038/nm.3394. PMID: 24202395; PMCID: PMC3954707.

b- Yeang CH, McCormick F, Levine A. Combinatorial patterns of somatic gene mutations in cancer. FASEB J. 2008 ;22(8):2605-22. doi: 10.1096/fj.08-108985. Epub 2008 Apr 23. PMID: 18434431.
c- Perge P, Igaz P. Basic Concepts of Genetics. Exp Suppl. 2019;111:3-19. doi: 10.1007/978-3-030-25905-1_1. PMID: 31588524.
d- Handel AE, Ebers GC, Ramagopalan SV. Epigenetics: molecular mechanisms and implications for disease. Trends Mol Med. 2010;16(1):7-16. doi: 10.1016/j.molmed.2009.11.003. Epub 2009. PMID: 20022812.
e- Ishikawa Y, Tokunaga K. [Progress of DNA based HLA typing methods]. Nihon Rinsho. 1996;54(12):3398-407. Japanese. PMID: 8976126.
f-Trachtenberg EA, Erlich HA. DNA-based HLA typing for cord blood stem cell transplantation. J Hematother. 1996;5(3):295-300. doi: 10.1089/scd.1.1996.5.295. PMID: 8817397.
g-Glaser P, Chandler M, Rocha E. Microbial genomics. Res Microbiol. 2007 Dec;158(10):721-3. doi: 10.1016/j.resmic.2007.10.003. Epub 2007. PMID: 18082580.
h- Kemble, Harry et al. "Recent insights into the genotype-phenotype relationship from massively parallel genetic assays." *Evolutionary applications* . 12,9 1721-1742. 2019,

doi:10.1111/eva.12846

Course coordinator: Prof. / Tarek Selim

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ماجستير طب الطوارئ والإصابات