Master (MSC) Degree Program and Courses Specifications for Clinical Pathology

(According to currently applied Credit point bylaws)

Clinical Pathology Department
Faculty of medicine
Assiut University
2022-2023

Master degree of Clinical Pathology

A. Basic Information

- **Program Title: Master degree of Clinical Pathology**
  Nature
- **Nature of the program: Single.**
- **Responsible Department: Clinical Pathology**
  Department- Faculty of Medicine- Assiut University.
- **Program Academic Director (Head of the Department):**
  Prof Dr Azza Mahmoud Ezz EL Din
- **Coordinator (s):**
  - **Principle coordinator: Prof. Dr Eman Naser**

  Assistant coordinator(s)
  Staff members of Clinical Chemistry Unit
  Staff members of Hematology unit
  Staff members of immunology unit
  Staff members of microbiology unit

Internal evaluators:
Prof. Neven Abdel-Moneim Hasan Kamel
Prof. Madiha Younis Bakhit Salim
Prof . Sohair Kamel Sayed Ahmad
Prof. Hesham Abdel-Raheem Abdel-Baset
Prof. Hanan galal Abdel-Azeem Ibrahim
Prof. Azza Mahmoud EzzEl-Dine Mostafa Mahmoud
Prof. Heba Allah Mohamed Gamal El-Din Rashed
Prof. Mohamed Zakaria Abdel-Rahman Ali Abo krisha

- **External evaluator**
  Prof.Dr./ Prof.Dr./Ekbal Hashem- Mansoura University
  Prof.Dr./ Ahmed abdel-samie- Menia University.
- **Date of Approval by the Faculty of Medicine Council of Assiut University:** 23/9/2014**.**
- **Date of most recent approval of program specification by the Faculty of Medicine Council of Assiut University: 27/11/2022**
- **Total number of courses: 5 courses**
  - **First part: 4 courses**
  - **Second part: 1 course**

B. Professional Information

1- Program aims

I/1. To enable candidates to keep up with international standards of clinical Pathology by teaching high levels of laboratory skills, in addition to updating medical knowledge as well as laboratory experience and competence in the areas of clinical chemistry, hematology, immunology, microbiology, blood banking, emergency lab and internal medicine and enabling the candidates to make appropriate referrals to a sub-specialist.

1/2. To help candidates develop an understanding of the appropriate use and interpretation of patient care tests in four sub-speciality areas of clinical pathology (clinical chemistry, hematology, immunology, and microbiology).

1/3. Become familiar with the consultation role of the clinical pathologist in patient care and research.

¼. To give candidates a glimpse of today's cutting-edge technology and equipment in clinical chemistry, hematology, immunology, and microbiology laboratory testing.

1/5. To help candidates to understand laboratory quality clinical chemistry, hematology, immunology, and microbiology laboratory testing.

1/6. To introduce candidates to the basics of scientific medical research.

1/7. To provide the candidates with a master's degree:

- Enabling them to start professional careers as specialist's in Egypt.
- Making them recognized as specialists abroad.
- Enabling them to pursue higher studies and subspecialties.
- Enabling them to understand and get the best of published scientific research and do their own.
- Updating their knowledge and self learning.
- Fellow the ethical standard of medical and clinical practice of patient care and research work according to our local Ethical Committee.

2-Intended learning outcomes (ILOs) *for the whole program*:

2/1Knowledge and understanding:

A. Explain the essential facts and principles of relevant basic sciences, including, clinical parasitology, the principals of general and clinical microbiology, the principals of general and clinical immunology, and internal medicine related to clinical pathology.

B. Mention important facts about clinically supportive sciences, such as clinical parasitology, the principal of general and clinical microbiology, the principal of general and clinical immunology, and internal medicine in relation to clinical pathology.

C. Demonstrate sufficient knowledge of the etiology, clinical picture, diagnosis, prevention, and treatment of common diseases and situations related to clinical pathology.

D. Give recent and update developments in the pathogenesis, early diagnosis of common diseases and situations related to clinical pathology and prevention of related complication.

E. Mention the basic ethical and medico legal principles relevant to the clinical pathology.

F. Mention the basic ethical and medicolegal principles relevant to the clinical pathology.

G. Mention the ethical and scientific principles of medical research.

H. State the impact of common health problems in the field of clinical pathology on the society.

I. Determine the importance of quality management system developments in clinical pathology laboratories.

2/2 Intellectual outcomes

A. Correlate the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis of common diseases of the clinical pathology.

B. Demonstrate an investigatory and analytic thinking approach (problem solving) to common clinical situations related to clinical pathology.

C. Design and present a case report for a common problem related to clinical pathology.

D. Formulate management plans (diagnosis and follow up of treatment) and alternative decisions in different situations in the field o f the clinical pathology.

2/3 Skills

2/3/1 Practical skills (Patient Care)

A. Take an accurate history, evaluate clinical data, and communicate effectively with patients in a caring and respectful manner.

B. Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgement for common conditions related to clinical pathology.

C. Carry out patient management plans (diagnosis and follow up of treatment) for common conditions related to clinical pathology.

D. Use laboratory information technology and quality management systems to support patient care decisions and patient education in common clinical situations related to clinical pathology

E. Perform non-invasive and invasive procedures considered essential for clinical pathology competently.

F. Provide health care services aimed at preventing health problems related to clinical pathology.

G. Provide patient-centered care in common clinical pathology conditions while collaborating with other health care professionals, including those from other disciplines.

J. Write all forms of professional reports related to clinical pathology (lab reports, experiment reports, etc.).

2/3/2 General skills

Including:

- Practice-based Learning and Improvement
- Interpersonal and Communication Skills
- Professionalism
- Systems-based Practice

Practice-Based Learning and Improvement

A. Perform practice-based improvement activities using a systematic methodology (share in audits and use logbooks).

B. Appraises evidence from scientific studies.

C. Conduct epidemiological Studies and surveys.

D. Perform data management including data entry and analysis.

E. Facilitate learning of students and other health care professionals.

Interpersonal and Communication Skills

F. Maintain therapeutic and ethically sound relationship with patients.

G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.

H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.

I. Work effectively with others as a member of a health care team or other professional group.

Professionalism

J. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society

K. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices

L. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Systems-Based Practice

M. Work effectively in relevant health care delivery settings and systems.

N. Practice cost-effective health care and resource allocation that does not compromise quality of care.

O. Assist patients in dealing with system complexities.

3- Program Academic Reference Standards (ARS) (Annex 2)

Academic standards for master degree in *Clinical pathology*

Assiut Faculty of Medicine developed master degree programs' academic standards for different clinical specialties.

In preparing these standards, the General Academic Reference Standards for post graduate programs (GARS) were adopted. These standards set out the graduate attributes and academic characteristics that are expected to be achieved by the end of the program.

These standards were approved by the Faculty Council on 17-6-2009. These standards were revised and approved without changes by the Faculty Council on 23-9-2014.These standards were revised and reapproved recently without changes by the Faculty Council on 27-11-2022.

4- Program External References(Benchmarks)

1. **ACGME (Accreditation Council for Graduate Medical education).**

2. **Residency Program of clinical Pathology, Emory University School of Medicine, Emory University Hospital, Atlanta, USA.**

http://pathology.emory.edu/Training_ClinicalPathology.html

Comparison between program and external reference		
Item	**Master Degree for Clinical Pathology**	Emory University School of Medicine Emory University Hospital, Atlanta, USA **Residency Program Of clinical pathology**
Goals	Matched	Matched
ILOS	Matched	Matched
Duration	2-4 years	3 years
Requirement	Different	different
Program structure	Different	different

5. Program Structure and Contents

A. Duration of program: 3 – 5 years

B. Structure of the program:

Total number of credits points : 180 (20 out of them for thesis)

Didactic# 40 (22.2 %), practical 120 (66.7%), thesis 20 (11.1%), total 180

First part

Didactic 14 (35 %), practical 24 (60 %), elective course 2 CP (5%), total 40

Second part

Didactic 24 (20%), practical 96 (80 %), total 120 # Didactic (lectures, seminars, tutorial)

According the currently applied bylaws:

Total courses 160 CP

Compulsory courses: 98.9%

Elective course: 2 credit point: 1.1%

	Points	% from total
▪ Basic science courses	24	13.3%
Humanity and social courses	2	1.1%
▪ Speciality courses	134	74.5%
▪ Others (Computer)	-	-
▪ Field training	120	66.7%
Thesis	20	11.1%

C. Program Time Table

A. Duration of program 3 years maximally 5 years divided into

- **Part 1: (36.6% from final marks)**

  Program-related basic science courses and ILOs + elective courses

  Students are allowed to sit the exams of these courses after at least 12 months from applying to the MSc degree.

  One elective course can be set during either the 1st or 2nd parts.

- **Thesis**

  For the MSc thesis;

  MSc thesis subject should be officially registered within 6 months from application to the MSc degree.

  Discussion and acceptance of the thesis could be set after 12 months from registering the MSc subject;

  It should be discussed and accepted before passing the second part of examination)

- **Part 2 (3 years)(64.4% from final marks)**

Program –related Speciality courses and ILOs

Students are not allowed to sit the exams of these courses before 3 years from applying to the MSc degree.

The students pass if they get 50% from the written exams and 60% from oral and clinical/practical exams of each course and 60% of summation of the written exams, oral and clinical/practical exams of each course
Total degrees 1900 marks.
700 marks for first part
1200 for second part
Written exam 40% - 70%.
Clinical /practical and oral exams 30% - 60%.

D. Curriculum Structure: (Courses): Courses): as mentioned above

Curriculum Structure: (Courses / units/ rotations):

Year 1

The first year of the fellowship is primarily for basic science related medical knowledge (studied in speciality courses over 6-18 months in collaboration with the departments of parasitology and internal medicine of Assiut Faculty of Medicine , principal of general and clinical microbiology and principal of general and clinical immunology in the clinical pathology department of Assiut Faculty of Medicine, and a practical year during which the fellows gain experience in the microbiology lab and immunology lab, blood bank, and emergency lab, develop proficiency in the performance and appropriate utilization of various laboratory techniques, and develop proficiency in the utilization and interpretation of laboratory testing. Throughout the year, emphasis is placed on developing: 1) an understanding of basic clinical parasitology; 2) an understanding of some subjects in internal medicine and the ability to efficiently formulate laboratory assessments; 3) an understanding of the principals of general and clinical microbiology and general and clinical immunology and the ability to critically analyze the relevant medical literature; and 4) skills in communicating with nursing and medical staff as well as house staff.
The first year fellow spends the year rotating among different services: 1) Assiut University Hospital's blood bank; 2) Assiut

University Hospital's emergency lab; 3) Assiut University Hospital's chemistry lab; 4) Assiut University Hospital's haematology lab; 5) Assiut University Hospital's immunology lab; and 6) Assiut University Hospital's microbiology lab. These rotations are briefly described below.

Years 2 and 3

Although the primary focus of the second and third years is the development of skills and experience in research (see below), senior fellows continue to participate in practical activities and certain procedures. First, they maintain their longitudinal laboratory experience throughout these years. Senior fellows will also actively participate in the regular weekly scientific seminars and collaborate with those fellows in their first year. In addition, fellows rotate through the different laboratory services for approximately two months on laboratory rotations (blood bank, chemistry lab, emergency lab, hematology lab, microbiology and Immunology lab, and outpatient lab). This rotation complements the previous inpatient and outpatient experiences. To identify a research area on which the subsequent two years will be focused. Together, the trainee and supervisor develop a project for investigation that is of interest to the trainee and within the expertise of the faculty member; in certain instances, joint mentorship provided by two faculty members within the division, or by one divisional faculty member and a collaborator from another unit, is appropriate. By the beginning of the second year, the fellow presents a conference in which he/she synthesizes existing knowledge, presents the problem for investigation, and describes the proposed plan of investigation. The faculty members and fellows in attendance provide feedback to the fellow and supervisors about the proposed project. This process of peer review provides a useful experience for the fellow and often strengthens the experimental approach.

During the second and third years, the trainee carries out the proposed work in the clinical research facilities of the faculty mentor(s). The trainee also benefits from interactions with other

trainees, technicians, and collaborating investigators. The trainee also participates in laboratory meetings and journal clubs specific to individual research groups. Presenting research findings at regional and national meetings and submitting work for publication are both important aspects of the investigative endeavor. The trainee will receive guidance and specific assistance in learning to prepare data for oral and written presentation, to prepare graphics, and to organize talks and prepare slides. Throughout the two-year research training period, it is anticipated that the fellow will assume increasing intellectual responsibility and technical independence.

Research Training Pathways

Selection of a research project and supervisors is subject to the approval of the Clinical pathology Department council approval and vice-Dean of post graduate studies of the faculty as officially regulated. Fellows may elect either essay or clinically or epidemiologically -based research training pathways. For all research fellows, a research advisory committee will be selected by the fellow based on the approved regulatory rules of the faculty council. This committee will monitor the progress of research fellows and provide advice regarding research training and career development.

courses of the program:

courses	Course Code	Core Credit points		
		Lectures	training	total
First Part				
Basic science courses (8CP) Course1:Clinical Parasitology Course 2: Principal of General and Clinical Microbiology Course 3: Principal of General and Clinical Immunology Course 4: Internal Medicine	 **CCP208** **CCP231A** **CCP231B** **CCP218**	 1 3.5 3.5 2	 1 1.5 1.5 -	 2 5 5 2
General clinical compulsory courses (6 points)		6		
Elective courses*	2CP			
- Elective course				
Clinical training and scientific activities:				
A. Clinical training in General clinical compulsory courses (clinical parasitology+ Internal medicine(4 CP)			4	
B. Clinical training and scientific activities in Speciality course (20 CP)			20	
Thesis	20 CP			
Total of the first part				
Second Part	Speciality courses 24 CP Speciality Clinical Work (log Book) 96 CP			
Speciality Courses(24 CP) Course 5; Clinical pathology	**CCP231C**	24		
Training and practical activities in clinical pathology (96 CP)			96	
Total of the second part		**24**	**96**	**120**
Total of the degree	**180**			

* Elective courses can be taken during either the 1st or 2nd parts.

Student work load calculation:

Work load hours are scheduled depending on the type of activities and targeted competences and skills in different courses

Elective Courses#:

- Medical statistics.
- Evidence based medicine.
- Medicolegal Aspects and Ethics in Medical Practice and Scientific Research
- Quality assurance of medical education
- Quality assurance of clinical practice.
- Hospital management

One of the above mentioned courses are prerequisites for fulfillment of the degree.

Thesis:

20 CP are appointed to the completion and acceptance of the thesis.;.

6. Courses Contents (Annex 1)

The competency based objectives for each course/module/rotation are specified in conjunction with teaching/training methods, requirements for achieving these objectives and assessment methods.

See Annex 1 for detailed specifications for each course/ module

7-Admission requirements

- **Admission Requirements (prerequisites) if any :**

I. General Requirements:

a. MBBCh Degree form any Egyptian Faculties of Medicine

b. Equivalent Degree from medical schools abroad approved by the Ministry of Higher Education

c. **One year appointment within responsible department (for non Assiut University based** registrars)

II. Specific Requirements:

a. Candidates graduated from Egyptian Universities

b. Candidate should be fluent in English (Study Language).

c. **External Candidate should be present in our department at the 2nd year of registration of Master degree**.

d. Should attend the scientific and clinical activities of our department for at least **80%.**

VACATIONS AND STUDY LEAVE

The current departmental policy is to give working residents 1-2 week leave prior to first/ second part exams according to departmental council.

FEES:

As regulated by the postgraduate studies rules and approved by the faculty vice dean of post graduate studies and the faculty and university councils.

8-Progression and completion requirements

- Examinations of the first part could be set at 12 months from registering to the MSc degree.
- Examination of the second part cannot be set before 3 years from registering to the degree.

- Discussion of the MSc thesis could be set after 1 year from officially registering the MSc subject before setting the second part exams.
- The minimum duration of the program is 3 years.

The students are offered the degree when:

1. Passing the exams of all basic science, elective and speciality courses of this program as regulated by the post graduates approved rules by the faculty council.
2. Completing all scheduled CP and log book (minimum 80%).
3. Discussion and acceptance of the MSc thesis.

9- Program assessment methods and rules (Annex IV)

Method	ILOs measured
Written examinations: **Structured essay questions** **Objective questions:** **MCQ** **Problem solving**	**K & I**
Clinical: **Long/short cases** **OSCE**	**K ,I, P &G skills**
Structured oral	**K ,I &G skills**
Logbook assessment	**All**
Research assignment	**I &G skills**

Weighting of assessments:

Courses		Degrees			
	Course code	Written Exam	Degree		Total
			Oral Exam *	Practical / Clinical Exam	
First part					
Basic academic Courses:					
Clinical Parasiytology	CCP208	50	20	30	100
Principal of General and Clinical Microbiology	CCP231A	125	50	75	250
Principal of General and Clinical Immunology	CCP231B	125	50	75	250
General clinical courses					
Internal Medicine	CCP218	65	35		100
		365	155	180	700
Second Part					
Speciality Courses:					
Clinical Pathology	**CCP231C**	**500**	**220**	480	1200
Elective course					

* 25% of the oral exam for assessment of logbook

Examination system:

➢ First part: after 18 months

-Written exam one paper 2 hours in Clinical Parasitology + oral & Practical exam.

- Written exam one paper 3 hours in Principal of General and Clinical Microbiology + Oral & Practical exam.

- Written exam one paper 3 hours in Principal of General and Clinical Immunology + Oral & Practical exam.

- Written exam one paper 2 hours in Principal of Internal Medicine + Oral exam.

➢ Second part:

Written exam two papers 3 hours in Clinical chemistry + oral & Practical exam.

Written exam two papers 3 hours in Hematology + oral & Practical exam.

Written exam one paper 2 hours in Immunology and clinical microbiology + oral exam.

➢ Elective courses

- Written exam one paper 1 hour in Elective course + Oral & Practical exam

10-Program evaluation

By whom	Method	sample
Quality Assurance Unit	Reports Field visits	#
External Evaluator (s):According to department council External Examiner (s): According to department council	Reports Field visits	#
Stakeholders	Reports Field visits Questionnaires	#
Senior students	Questionnaires	#
Alumni	Questionnaires	#

#Annex 5 contains evaluation templates and reports (Joined in the departmental folder).

11-Declaration

We certify that all of the information required to deliver this program is contained in the above specification and will be implemented.

All course specifications for this program are in place.

Contributor	Name	Signature	Date
▪ **Program Principle Coordinator:**	**Prof. Dr Eman Nasser**		
▪ **Head of the Responsible Department (Program Academic Director):**	**Prof Dr Azza Mahmoud Ezz EL Di**		

Annex 1, Specifications for Courses / Modules

Annex 1: specifications for courses/

Course 1 Clinical Parasitology

- **Name of department: Clinical Pathology**
  - **Faculty of medicine**
  - **Assiut University**
  - **2022/2023**

1. Course data

- **Course Title: Clinical parasitology**
- **Course code: CCP208**
- **Speciality : Clinical Pathology**
- **Number of points: Credit points Didactic 2 credit, (50%) practical2 credit.(50%).total 4 credit points**
- **Department (s) delivering the course: Department of parasitology in conjunction with Clinical pathology.**
- **Coordinator (s): Staff members of parasitology Department in conjunction with Clinical Pathology Department as annually approved by both departments councils**
- **Date last reviewed: 5/2022**
- **General requirements (prerequisites) if any : None**
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course Aims

2.1The student should acquire the detailed principals of clinical Parasitology necessary for clinical pathology in clinical reasoning and diagnosis.

3. Course intended learning outcomes (ILOs):

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Describe detailed Principles of Clinical Parasitology:(Life cycle, pathogenesis and laboratory diagnosis of ; *-Helminthesis : -Class Trematoda • Liver Flukes • Intestinal Flukes • Blood Flukes • Lung Flukes - Class Cestoda • Taenia • Echinococcus • Hymenolepis • Diphyllobothrium latum - Class Nematoda • Tissue • Intestinal *-Protozoa : • Entamoeba • Giardia • Trichomonas • Trypanosoma • Leishmania • Plasmodium • Toxoplasma • Cryptospordium • Balantidium Coli • Babesia	-Lectures -Laboratory work	-Written, oral and practical examination - Log book

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of clinical parasitology with clinical reasoning and diagnosis of common diseases related to **clinical pathology.**	Didactic (lectures, seminars, tutorial)	-Written, and oral examination

C- Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Identify common parasites by examining eggs and larvae under the microscope.	Laboratory work	- Practical exam. -Logbook
B-Use information technology to support decisions related to clinical Parasitology of clinical pathology.		

D-General Skills
Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform data management including data entry and analysis.	-Observation and supervision -Written and oral communication	Log book

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
B. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.	-Observation and supervision -Written and oral communication	Log book
C. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
D. Write a report in common condition mentioned in A.A		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
E. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation -Senior staff experience	Logbook
F. **Demonstrate a commitment** to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
G. Work effectively in relevant health care delivery settings and systems.	Observation -Senior staff experience	Logbook

4. Course contents (topic s/modules/rotation
Course Matrix

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	**Intellectual**	**Practical skills**	**General Skills**
Describe (Life cycle, pathogenesis and laboratory diagnosis of	**A**	**A**	**A,B**	**A-D**
*-Helminthesis				
-Class Trematoda • Liver Flukes • Intestinal Flukes • Blood Flukes • Lung Flukes	**A**	**A**	**A,B**	**A-D**
-Class Cestoda • Taenia • Echinococcus • Hymenolepis • Diphyllobothrium latum	**A**	**A**	**A,B**	**A-D**
- Class Nematoda • Tissue • Intestinal	**A**	**A**	**A,B**	**A-G**
*-Protozoa				
• Entamoeba • Giardia • Trichomonas • Trypanosoma • Leishmania • Plasmodium • Toxoplasma • Cryptospordium • Balantidium Coli • Babesia	**A**	**A**	**A,B**	**A-D**

5. Course Methods of teaching/learning:

1 Didactic (lectures, seminars, tutorial)
2 Laboratory work
3 Observation and supervision
4 Written & oral communication
5 Senior staff experience

6. Course Methods of teaching/learning: for students with poor achievements

1. Extra Didactic (lectures, seminars, tutorial) according to their needs
2. Extra Laboratory work according to their needs

7. Course assessment methods:

i. Assessment tools: 1- Written, oral and practical examination.
2-Log book.

ii. Time schedule: At the end of the first part

iii. Marks: 60% of the first part (100 MARK)

8. List of references

i. Lectures notes

- Course notes
- Staff members print out of lectures and/or CD copies

ii. Essential books

Parasitology notes of department

iii. Recommended books

- Medical Diagnostic Parasitology By Lynne Shore Garcia,By Lynne S. Garcia,fifth edition,2007.

iv. Periodicals, Web sites, … etc

- Journal of Parasitology,
- Journal of Helminthology

v. Others

None

9. Signatures

Course Coordinator: **Prof.**	**Head of the Department:** **Prof.**
Date:	**Date:**

Course 2 Principal of General and Clinical Microbiology

- **Name of department: Clinical Pathology**
  - **Faculty of medicine**
  - **Assiut University**
  - **2022-2023.**

1. Course data

- **Course Title: Principal of General and Clinical Microbiology Course code: CCP2331A**

- **Speciality : Clinical Pathology**

- **Number of points: Credit points Didactic 2.5 credit, (50%) practical 2.5 credit.(50%).total 5 credit points**

- **Department (s) delivering the course: Department of Clinical pathology- Faculty of Medicine-Assiut University.**
  - **Coordinator (s): Staff members of Clinical Pathology Department Microbiology Unit.**
  - **Course coordinator: Prof.Heba Gamal Rashed**
  - **Assistant coordinator (s) Dr. Mohamed Zakeria**
    Dr. Asmaa Omar
  -

- **Date last reviewed: 5/2022**

- **General requirements (prerequisites) if any : None**

- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course Aims

2/1- To enable candidates to keep up with international standards of general and clinical microbiology by teaching a high level of laboratory skills, in addition to updating medical knowledge as well as laboratory experience and competence in the area of clinical microbiology.
2/2- To help candidates develop an understanding of the appropriate use and interpretation of patient care tests in four sub-speciality areas of clinical pathology (clinical microbiology).
2/3- To become familiar with the consultation role of the clinical microbiology in patient care and research.
2/4 -To provide candidates with a glimpse of the current state of the art technology and equipment of laboratory testing in clinical microbiology.
2/5 -To introduce candidates to the basics of scientific medical research.

3. Course intended learning outcomes (ILOs):

A-Knowledge and understanding

ILOs	**Methods of teaching/ learning**	***Methods of Evaluation***
A. Describe detailed Principles of Clinical **General microbiology** a- Diagnostic techniques in microbiology & Sterilization b- Collection of samples& Transportation of samples c- Processing of samples& Rejection of samples d- Antibiotic groups & drug resistant e- Gram positive cocci and bacilli f- Gram negative cocci, bacilli and coccobacilli g- Anaerobic bacteria h- Mycobacteria i- Fastidious organisms j- Spirochaetes **Medical mycology:** a- Basic mycology b- Superficial and cutaneous Mycosis c- Subcutaneous mycosis d- Systemic mycosis	-Lectures -Laboratory work	-Written, oral and practical examination **- Log book**
B. Describe the etiology, clinical picture, and		

diagnosis of the following diseases and clinical conditions associated with: - Gram positive cocci . -Gram negative cocci -Gram positive rods -Gram negative rods -spirochetes -Poorly gram staining organisms -Important fungal infections - Viral infection - Quality in microbiology laboratories		
C. State update and evidence based Knowledge of conditioned mentioned in A&B.		
D. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to l microbiology		
E. Mention the basic ethical and medicolegal principles revenant to the microbiology.		
F. Mention the basics of quality assurance to ensure good clinical care in his field		
G. Mention the ethical and scientific principles of medical research		
H. State the impact of common health problems in the field of speciality on the society. Field of speciality on the society.		

Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. A. Correlates the facts of basic bacteriology with clinical reasoning and diagnosis of common diseases related to **microbiology.**	Didactic (lectures, seminars, tutorial)	-Written, and oral examination
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common		

clinical situations related to Microbiology		
C. **Design and present** cases , seminars in common problem in Microbiology.		
D-Formulate management plans and alternative decisions in different situations in the field of the Microbiology.		

C-Practical skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Demonstrate an investigatory and analytic thinking approach to the following conditions: related to microbiology mentioned in AA,AB	Clinical round with senior staff Observation Postgraduate teaching Hand on workshops	Procedure presentation - Log book - Chick list
B-Use information technology to support decisions related to clinical Parasitology of clinical pathology. B. Recommend the following non invasive diagnostic procedures; *.Sampling and Specimens collection: Blood, Urine, Pus, Sputum, Stool and biological fluid --Techniques - Precautions - Containers *- Transportation and Processing of Specimens: Blood, Urine, Pus, Sputum, Stool and biological fluids *-Staining procedures: -Gram stain -Ziehl-Neelsen stain - Fluorescent stains *-Media preparation		

-Nutrient -Blood -Chocolate -MacConkey -Manitol- salt -Eosin Methylene Blue -CLED *- culture of different specimens -Blood - CSF -Wound - Urine -Sputum -Stool - Biological fluid *-Isolation and identification of aerobic organisms *- Culture of anaerobe -Techniques -Precautions - Container *- Antibiogram *-Tuberculosis: -Direct smear microscopy -Z-N preparation -Culture on LJ -Identification of strains -Interpretation -Drug susceptibility -New methods: PCR -Advanced Techniques : -PCR -PCR- RFLP *- Automation in Microbiology		
C. Interpret the following non invasive diagnostic procedures mentioned in C.B		
D. Perform the following non invasive/invasive		

diagnostic procedures mentioned in C.B		
E. Carry out patient management plans for common conditions related to microbiology**.**		
F. Use information technology to support patient care decisions and patient education in common clinical situations related to microbiology		
G.Provide health care services aimed at preventing health problems infectious diseases related to microbiology		
H. Provide patient-focused care in common conditions related to clinical microbiology, while working with health care professionals, including those from other disciplines		
I. Write competently all forms of reports related to microbiology, (lab reports).		

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	-Case log -Observation and supervision -Written & oral communication	Procedure/case presentation -Log book and Portfolio
B. Appraises evidence from scientific studies(journal club)	-Journal clubs - Discussions in seminars and clinical rounds	
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.	Clinical rounds Senior staff experience	

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain diagnostic and ethically sound relationship with patients.	Simulations Clinical round Seminars Lectures Case presentation Hand on workshops	Global rating Procedure/case presentation Log book Portfolios Chick list and
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case in Microbiology	Practical round Seminars	
K. Write a report in all investigations mentioned in C.B.	Senior staff experience	Chick list
L. Council patients and families about conditioned mentioned in B.A.	Clinical round with senior staff	

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation Senior staff experience Case taking	1. Objective structured clinical examination 2. Patient survey
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		1. Objective structured clinical examination 2. 360o global rating
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		**1. Objective structured clinical examination**

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems.	Observation Senior staff experience	360o global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		Check list evaluation of live or recorded performance
R. Assist patients in dealing with system complexities.		- 360o global rating - Patient survey

4. Course contents (topic s/modules/rotation
Course Matrix

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skills	General Skills
basic microbiology	**A**	**A**	**---**	**A-C**
Basic Virology	**A**	**A**	**---**	**A-C**
Basic Mycology	**A**	**A**	**---**	**A-C**
Laboratory strategy in diagnosis of bacterial infections	**A-H**	**A-D**	**A-I**	**A-K P-R**
Gram positive cocci	**A-H**	**A-D**	**A-I**	**A-K P-R**
Gram negative cocci	**A-H**	**A-D**	**A-I**	**A-K P-R**
Gram positive rods	**A-H**	**A-D**	**A-I**	**A-K P-R**
Gram negative rods	**A-H**	**A-D**	**A-I**	**A-K P-R**
Spirochaetes	**A-H**	**A-D**	**A-I**	**A-K P-R**
Poorly gram staining organisms	**A-H**	**A-D**	**A-I**	**A-K P-R**
Important fungal infections	**A-H**	**A-D**	**A-I**	**A-K P-R**
Antimicrobial chemotherapy	**A-H**	**A-D**	**A-I**	**A-K P-R**
Technologic advances in clinical microbiology	**A-H**	**A-D**	**A-I**	**A-K P-R**
Immunologic methods in clinical microbiology	**A-H**	**A-D**	**A-I**	**A-K P-R**
Molecular methods in clinical microbiology	**A-H**	**A-D**	**A-I**	**A-K P-R**
Sterilization techniques	**A-H**	**A-D**	**A-I**	**A-K P-R**
Nosocomial infection	**A-H**	**A-D**	**A-I**	**A-K P-R**
Biological terrorism	**A-H**	**A-D**	**A-I**	**A-K P-R**

5. Course Methods of teaching/learning:

1. Didactic: Lectures.
2. Seminars.
3. Service teaching.
4. Post graduate teaching
5. hand on work shops
6. Case presentation
7. Simulations

6. Course Methods of teaching/learning: for students with poor achievements

1-Didactic: Lectures.
2-Seminars.
3-Service teaching.
4-Post graduate teaching
5-hand on work shops
6-Case presentation
7-Simulations

7. Course assessment methods:

i. Assessment tools:

- Clinical examination
- Written and oral examination
- Chick list
- log book & portfolio
- Procedure/case presentation
- MCQ examination
- Objective structured clinical examination
- Check list evaluation of live or recorded performance
- Patient survey
- 360o global rating

ii. Time schedule: At the end of the first part

iii. Marks: 60% of the first part (250 MARK)

8. List of references

i. Lectures notes

i. Lectures notes

Staff members print out of lectures and/or CD copies

ii. Essential books

Jawetz medical microbiology **Jawetz Melnick & Adelbergs Medical Microbiology 28 E,** Stefan Riedel, Stephen A. Morse, Timothy A. Mietzner, Steve MillerMcGraw Hill Professional, Aug 25, 2019 - ,LANGE.

iii. Recommended books

7-Diagnostic Microbiology (Koneman**),**edited by Elmer W. Koneman,7th edition,2017.

iv. Periodicals, Web sites, etc

- Journal of Clinical Microbiology
- Clinical Microbiology reviews
- Journal of Bacteriology

v. Others

None

9. Signatures

Course Coordinator: Prof. Heba Gamal Rashed .	**Head of the Department:** **Prof Dr Azza Mahmoud Ezz EL I**
Date:	**Date:**

Course 3 Principal of general and clinical immunology

- **Name of department: Clinical Pathology**
  - **Faculty of medicine**
  - **Assiut University**
  - **2022-2023**

1. Course data

- **Course Title: Principal of general and clinical immunology**
- **Course code: CCP231B**
- **Speciality : Clinical Pathology**
- **Number of points: Credit points Didactic 2.5 credit, (50%) practical 2.5 credit.(50%).total 5 credit points**
- **Department (s) delivering the course: Department of Clinical pathology- Faculty of Medicine-Assiut University.**
  - **Coordinator (s): Staff members of Clinical Pathology Department Immunology Unit.**
  - **Course coordinator: Prof.Waff Tohame**
  - **Assistant coordinator (s) Dr. Soheir Kamel**
    Dr. Ashraf Hasabella
    Dr. Tark Taha
- **Date last reviewed: 5/2022**
- **General requirements (prerequisites) if any : None**
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course Aims

2/1 To enable candidates to keep with international standards of General and Basic and clinical immunology by teaching high level of laboratory skills, in addition to update medical knowledge as well as laboratory experience and competence in the area of clinical immunology.

2/2. To help candidates develop an understanding of the appropriate use and interpretation of patient care tests in four sub-speciality areas of clinical pathology (clinical immunology).

2/3 To become familiar with the consultation role of the clinical microbiology in patient care and research.

2/4 To provide candidates with a glimpse of the current state of the art technology and equipment of laboratory testing in clinical microbiology.

5/5 To introduce candidates to the basics of scientific medical research.

3. Course intended learning outcomes (ILOs):

A-Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Describe detailed Principles of basic and clinical immunology i.e. ***Basic Immunology:*** **a- Introduction to immune system** - Cells of immune system - Antigens and receptors **b- Innate Immune system** - Barrier to infection - cells of innate immune system - Innate immune function **d- Adaptive Immune system** - Molecules of adaptive Immunity - Cells and organs - Lymphocyte Antigen receptor - Lymphocyte development - Lymphocyte Activation - Lymphocyte function - Regulation of Adaptive responses e- **Immunological tolerance** ***Basic Immunology Techniques:** a- Safety and sampling b- Precipitation and agglutination c- Labeled Immunoassay d- Molecular diagnostics e- Flow cytometry. f- Automation in Immunology lab ***Clinical Laboratory Immunology:*** *a- Autoimmune diseases* - Liver diseases - Endocrine diseases - Connective tissue diseases - Renal disease - Hematological diseases *b- Immunoproliferative disorders* c- Immune response, serological and molecular	Didactic; -Lectures -Practical rounds -Seminars -practical rotations (service teaching)	**-OSCE at the end of each year** **-log book & portfolio** **- MCQ examination at the second year** **-Oral and written exam**

detection of Bacteria d- Immune response, serological detection of Parasitic and spirochete diseases e- Immune response, serological and molecular detection of Viral diseases- Hepatitis-EBV, Cytomegalovius ,rubella f- HIV disease COVID 19 Quality in immunology laboratories		
B. Describe the etiology, clinical picture, and diagnosis of the following diseases and clinical conditions: *Acquired immunodeficiency diseases (Human immunodeficiency Virus) - Molecular and biologic features - Pathogenesis - Clinical features - Immune response - Diagnosis *- Virus of the immune system *- Rheumatic Diseases -Systemic lupus erythematosus -Rheumatoid arthritis * -Endocrine Diseases -Type 1 (Insulin- dependent) Diabetes mellitus -Autoimmune thyroid disease *- Liver Diseases -autoimmune hepatitis. -Primary biliary cirrhosis. -Viral Hepatitis -Drug –induced hepatitis. *- Renal Diseases. *-Hematological diseases.	**-OSCE at the end of each year** **-log book & portfolio** **- MCQ examination at the second year** **-Oral and written exam**	
C. State update and evidence based Knowledge of conditioned mentioned in A&B.		
D. Memorize the facts and principles of the		

relevant basic and clinically supportive sciences related to Immunology		
E. Mention the basic ethical and medicolegal principles revenant to the immunology.		
F. Mention the basics of quality assurance to ensure good clinical care in Immunology		
G. Mention the ethical and scientific principles of medical research		
H. State the impact of common health problems in the field of Immunology on the society.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning and diagnosis of common diseases related to **Immunology.**	Clinical rounds Senior staff experience	Procedure/case presentation Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Immunology.		
C. Design and present cases , seminars in common problem of immunology		
D-Formulate management plans and alternative decisions in different situations in the field of Immunology		

C-Practical skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Demonstrate an investigatory and analytic thinking approach to the following conditions: related to immunology mentioned in AA,AB	-Didactic; -Lectures -Clinical rounds -Seminars -Clinical rotations (service teaching)	OSCE at the end of each year -log book & portfolio - One MCQ examination at the second half of the second year and another one in the third year
B. **Recommend** the following non invasive diagnostic laboratory procedures - Screening test for hypersensitivity and detection of different allergens. - - Cytogenetic analysis. - Real time PCR and its applications. - Advanced molecular techniques. - All tests mentioned in D	Clinical round with senior staff Observation Post graduate teaching Hand on workshops	-Procedure presentation - Log book - Chick list
C. Interpret the following non invasive diagnostic laboratory procedures - Cytogenetic analysis. - Quantitative PCR - Real time PCR and its applications. - Advanced molecular techniques. - All tests mentioned in D	Clinical round with senior staff	Procedure presentation - Log book - Chick list
D. Perform the following non invasive diagnostic laboratory procedures -Serological tests: Widal test. Malta test. RF. ASOT.	Clinical round with senior staff -Perform under supervision of senior	Procedure presentation - Log book - Chick list

CRP. -Virological tests by AxSym *Hepatitis markers. - Anti-HIV - Anti-HCV -HBsAg - Anti-HBsAg (AUSAB) - HBeAg - Anti-HBeAg - Anti-cIgM - Anti-cIgG - Rubella IgM - Rubella IgG - CMV IgM - CMV IgG - Toxoplasma IgM - Toxoplasma IgG -ELISA tests - RIBA test -Separation of lymphocytes - Counts of T cells - Counts of B cells - C3, C4, IgM, IgG, and IgA tests. - Autoantibodies tests. *Anti-ds DNA *ANA, * ASMA, AMA, LKMA *Anti-thyroid antibodies. *Anti-sperm antibodies. *Anti-cardiolipin -immunophenotyping by Flowcytometry -Qualitative PCR	staff	
E. Carry out patient management plans for common conditions related to Immunology.	Clinical round with senior staff	
F. Use information technology to support patient care decisions and patient education in common clinical situations related to Immunology.		
G. Provide health care services aimed at preventing health problems related to Immunology like: conditioned mentioned in A.A.		

H-Provide patient-focused care in common conditions related to Immunology, while working with health care professionals, including those from other disciplines like: Conditions mentioned in B.A.		
I. Write competently all forms of reports related to the Immunology, (lab reports).		

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	-Case log -Observation and supervision -Written & oral communication	Procedure/case presentation -Log book and Portfolios
B. Appraises evidence from scientific studies(journal club)	Journal clubs - Discussions in seminars and clinical rounds	
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.	Clinical rounds Senior staff experience	

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain **diagnostic** and ethically sound relationship with patients.	Simulations Clinical round Seminars Lectures Case presentation	Global rating Procedure/case presentation Log book Portfolios Chick list

G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.	Hand on workshops	
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case in common problems related to Immunology.	Clinical **(practical)**round Seminars	
K. Write a report in: -All investigations in immunology.	Senior staff experience	Chick list
L. Council patients and families about: -Viral hepatitis -Transmission of hepatitis C and B - HIV	Clinical round with senior staff	

Professionalism

ILOs	**Methods of teaching/ learning**	**Methods of Evaluation**
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation Senior staff experience Case taking	1. Objective structured clinical examination 2. Patient survey
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		1. 360o global rating
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		1. Objective structured clinical examination 2. 360o global rating

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems.	Observation Senior staff experience	360o global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		Check list evaluation of live or recorded performance
R. Assist patients in dealing with system complexities.		- 360o global rating - Patient survey

4. Course contents (topic s/modules/rotation
Course Matrix

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skills	General Skills
Cells, tissues and organs of	**A,C-D**	**A**	**---**	**A**
Anatomy and function of lymphoid tissue.	**A,C-D**	**A**	**---**	**A**
Mechanism and Pathways of lymphocytes recirculation and homing	**A,C-D**	**A**	**---**	**A**
Antigen	**A,C-D**	**A**	**---**	**A**
Innate Immunity	**A,C-D**	**A-D**	**---**	**A-C**
Complement	**A,C-D**	**A-D**	**---**	**A-C**
Antigen Presenting Cells and antigen presentation	**A,C-D**	**A**	**---**	**A-R**
Adaptive Immunity	**A,C-D**	**A-D**	**---**	**A-C**
Immunoglobulin	**A,C-D**	**A-D**	**---**	**A-R**
Natural killer cells	**A,C-D**	**A-D**	**---**	**A-C**
Cytokines	**A,C-D**	**A-D**	**---**	**A-C**
The major histocompatibiltiy complex	**A,C-D**	**A**	**---**	**A-C**
Apoptosis	**A,C-D**	**A**	**---**	**A-C**
Immunological Tolerance	**A**	**A**	**---**	**A-C**
Immune response to viral	**A**	**A**	**---**	**A-C**
Acquired immunodeficiency diseases	**A-H**	**A-D**	**A-I**	**A-K P-R**
Virus of the immune system	**A-H**	**A-D**	**A-I**	**A-K P-R**
Rheumatic Diseases	**A-H**	**A-D**	**A-I**	**A-K P-R**
Endocrine Diseases	**A-H**	**A-D**	**A-I**	**A-K P-R**

Liver Diseases	**A-H**	**A-D**	**A-I**	**A-K** **P-R**
Renal Diseases.	**A-H**	**A-D**	**A-I**	**A-K** **P-R**
Hematological diseases	**A-H**	**A-D**	**A-I**	**A-K** **P-R**

5. Course Methods of teaching/learning:

1-Didactic: Lectures.
2-Seminars.
3-Service teaching.
4-Post graduate teaching
5-hand on work shops
6-Case presentation
7-Simulations

6. Course Methods of teaching/learning: for students with poor achievements

1-Didactic: Lectures.
2-Seminars.
3-Service teaching.
4-Post graduate teaching
5-hand on work shops
6-Case presentation
7-Simulations

7. Course assessment methods:

i. Assessment tools:

- Clinical examination
- Written and oral examination
- Chick list
- log book & portfolio
- Procedure/case presentation
- MCQ examination

- Objective structured clinical examination
- Check list evaluation of live or recorded performance
- Patient survey
- 360o global rating

ii. Time schedule: At the end of the first part

iii. Marks: 250 mark

8. List of references

i. Lectures notes

i. Lectures notes

Staff members print out of lectures and/or CD copies

ii. Essential books

- Basic immunology ,By E. R. Gold, D. B. Peacock,4th edition,2014.

- Basic and clinical immunologyy Mark Peakman, Diego Vergani,2nd edition,2009.

- Cellular and Molecular Immunology ,By Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai .EIGHTH EDITION,2012.

iii. Recommended books

Medical Immunology, 7th Edition edited by Gabriel Virella,2020.

iv. Periodicals, Web sites, … etc

- Egyptian journal of immunology
- The journal of immunology
- Journal of clinical immunology

v. Others

None

9. Signatures

Course Coordinator: Prof.Waff Tohame	**Head of the Department: Prof Dr Azza Mahmoud Ezz EL I**
Date:	**Date:**

Course 4 Internal Medicine

- **Name of department: Internal Medicine**
  - **Faculty of medicine**
  - **Assiut University**
  - **2022/2023**

1. Course data

- **Course Title: internal medicine**

- **Course code: CCP218**
- **Speciality : Clinical Pathology**

- **Number of points: 2 Credit points for Didactic(50%),2 credit points for training (50%).total 4 credit points.**

- **Department (s) delivering the course: Department of internal medicine in conjunction with Clinical pathology.**
- **Coordinator (s): Staff members of internal medicine Department in conjunction with Clinical Pathology Department as annually approved by both departments councils**
- **Date last reviewed: 5/2022**

- **General requirements (prerequisites) if any : None**

- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course Aims

2/1-The student should acquire the **principals** of **detailed internal medicine** necessary for clinical pathology in clinical reasoning and diagnosis.

3. Course intended learning outcomes (ILOs):

A-Knowledge and understanding

ILOs	**Methods of teaching/ learning**	***Methods of Evaluation***
A. Explain update and evidence based etiology, clinical picture, diagnosis and management of the following : ***Kidney diseases:** - Glomerulonephritis - Nephrotic Syndrome - Renal failure ***Electrolytes** *** Acute coronary syndrome** *** Diabetes Mellitus** ***Diabetes Insipidus** ***Liver diseases**: - Hepatitis - Liver cirrhosis - Markers of HCC ***Hematology:** - Anemia - Leukemia - Lymphoma ***Rheumatology** - Systemic Lupus Erythermatosus - Rheumatoid Artheritis	-Lectures -Laboratory work	-Written, oral and practical examination **- Log book**

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the clinical presentation of different cases related to **clinical pathology.**	Didactic (lectures, seminars, tutorial)	-Written, and oral examination

C-Practical skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A- Take history, examine and clinically diagnose different conditions related to internal medicine	Laboratory work	- practical exam. -Logbook
B-Use information technology to support decisions related to internal medicine.		

D-General Skills
Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform data management including data entry and analysis.	-Observation and supervision -Written and oral communication	Log book

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
B. Create and sustain a therapeutic and ethically sound relationship with patients	-Observation and supervision -Written and oral communication	Log book
C. Perform the following oral communications: Interpretation of the results of different investigations related to internal medicine		
D. Write a report in common condition mentioned in A.A		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
E. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation -Senior staff experience	Logbook
F. **Demonstrate a commitment** to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
G. Work effectively in relevant health care delivery settings and systems.	Observation -Senior staff experience	Logbook

4. Course contents (topic s/modules/rotation
Course Matrix

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skills	General Skills
Kidney diseases: - Glomerulonephritis - Nephrotic Syndrome - Renal failure	**A**	**A**	**A,B**	**A-D**
Electrolytes	**A**	**A**	**A,B**	**A-D**
Acute coronary syndrome	**A**	**A**	**A,B**	**A-D**
Diabetes Mellitus	**A**	**A**	**A,B**	**A-G**
Diabetes Insipidus	**A**	**A**	**A,B**	**A-D**
Liver diseases: - Hepatitis - Liver cirrhosis - Markers of HCC	**A**	**A**	**A,B**	**A-G**
Hematology: - Anemia - Leukemia - Lymphoma	**A**	**A**	**A,B**	**A-G**
rheumatology - Systemic Lupus Erythermatosus - Rheumatoid Arthritis	**A**	**A**	**A,B**	**A-G**

5. Course Methods of teaching/learning:

1-Didactic (lectures, seminars, tutorial)

2-Inpatient

3-Clinical rounds

4-Clinical rotations

5-Laboratory work

6-Observation and supervision

7-Written & oral communication

8-Senior staff experience

6. Course Methods of teaching/learning: for students with poor achievements

2. Extra Didactic (lectures, seminars, tutorial) according to their needs
3. Extra Laboratory work according to their needs

7. Course assessment methods:

i. Assessment tools: 1- Written, oral and practical examination.

2-Log book.

ii. Time schedule: At the end of the first part

iii. Marks: 65 % Didactic and 35% oral (100 marks of the first part)

8. List of references

i. Lectures notes

- Course notes
- Staff members print out of lectures and/or CD copies

9. Signatures

Course Coordinator:	**Head of the Department:**
Date:	**Date:**

Second Part

Course 5 /Clinical pathology

- **Name of department: Clinical Pathology**
  - **Faculty of medicine**
  - **Assiut University**
  - **2022-2023**

1. Course data

- **Course Title: Clinical Pathology**
- **Course code: CCP231C**

- **Speciality : Clinical Pathology**

- **Number of Credit points(CP) Didactic 24CP, (17.2%) practical 116CP.(82.8%).total 140 credit points**

- **Department (s) delivering the course: Department of Clinical pathology- Faculty of Medicine-Assiut University.**
  - **Coordinator (s): Staff members of Clinical Pathology Department**
  - **Course coordinator: Prof.Eman Naser**
- **Assistant coordinator (s):**

Prof. Sohair Mohamed Ahmed Farghaly
Dr. Ebtsam Farouk Mohamed Hassan
Prof. Hanan Omar Mohamed Omar
Prof.Eman Nasr Eldin Mohamed Mohamed Fandy
Prof. Sahar Abdullah Morsy El-Gammal
Prof. Ola Abdel-Halim Mohamed El-Sayed Afify
Dr. Asmaa Omar Ahmed Mohamed

- **Date last reviewed: 5/2022**
- **General requirements (prerequisites) if any : None**

- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**
- **This course consists of 4 Units (Modules)**
- **1-Unit (Module) 1 Clinical Chemistry.**
- **2- Unit (Module) 2 Hematology**
- **3- Unit (Module) 3 Immunology**
- **4- Unit (Module) 4 Microbiology**
- **(subsidiary rotation : Blood bank, Emergency Lab, Outpatient Clinic)**
- **Weighting of units and time table in Speciality course.**

Units' Titles' list	% from total Marks	Level (Year)	Core Credit points		
			Didactic	training	Total
1)Unit 1 "Clinical Chemistry."	35.8 %	1&2&3	11	39	50
2)Unit 2 " Hematology".	35.8 % 14.2%	1&2&3 3	11 1	39 19	50 20
3) Unit 3"Clinical Immunology"	14.2 %	3	1	19	20
4)Unit 4"Clinical Microbiology"					
Total No. of Units:	4		24	116	140

Unit Coordinator (s):

Unit	Principle coordinator	Assistant coordinator
Clinical Chemistry	Dr. Omenia Abdel-Moneam	Dr. Ebtsam Farouk Dr. Heba Abdel-Hafiz
Hematology	Dr. Sahar Abdala El-Gamal	Dr. Ola Abdel-Halim Afifi
Immunology	Prof. Wafaa Tohamy	Prof.Dr.Azza Mahmoud
Microbiology	Prof. Heba Gamal Rashed	Dr. Mohammad Zakaria

2. Course Aims

2/1 To enable candidates to keep with international standards of clinical Pathology by teaching high level of laboratory skills, in addition to update medical knowledge as well as laboratory experience and competence in the area of clinical chemistry, hematology, immunology, microbiolgy, blood banking and emergency lab and enabling the candidates of making appropriate referrals to a sub- specialist

2/2. To help candidates develop an understanding of the appropriate use and interpretation of patient care tests in four sub-speciality areas of clinical pathology (clinical chemistry, hematology, immunology, and microbiology).

2/3 To become familiar with the consultation role of the clinical pathologist in patient care and research.

2/4 To provide candidates with a glimpse of the current state of the art technology and equipment of laboratory testing in clinical chemistry, hematology, immunology, and microbiology.

2/5 To introduce candidates to the basics of scientific medical research.

2/6 To provide the candidates with master degree:

- Enabling them to start professional careers as specialists in Egypt.
- Making them recognized as specialists abroad.
- Enabling them to pursue higher studies and subspecialties.
- Enabling them to understand and get the best of published scientific research and do their own.
- Updating their knowledge and self learning.
- Fellow the ethical standard of medical and clinical practice of patient care and research work according to our local Ethical Committee.

3. Course intended learning outcomes (ILOs):

Unit (Module 1) Clinical Chemistry

A-Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Describe the detailed knowledge of the following; I. Laboratory principles: * General laboratory techniques, procedures and safety. • Chemicals and related substances. • Centrifugation and weighing. • Volumetric equipments and its calibration. • Concept of solvent and solute • Buffer solution • Units of measurement. • Safety. *Specimen collection and other preanalytical variables. II. Analytical techniques and instrumentation: 1)Spectrophotometeric techniques *Explain the general principles of each analytic method. *Describe the operation and components parts of flame emission spectrophotometry and atomic absorption spectrophotometry, osmometer, ion selective electrode, PH electrode, electrophoresis and chemiluminescence's. RID, immune electrophoresis 2)Basic principles of radioactivity and its measurements. 3) Electrochemistry.	-Lectures -Laboratory work	-Written, oral and practical examination **- Log book**

• Potentiometry • Amperometry • Coulometry • conductometry 4)Chromatography / mass spectrometry: HPLC. Gas chromatography Mass spectrometry. 5) Automation in clinical laboratory *Explain the major steps in automated analysis *Operate properly on different instrumentation and auto analyzers. III. Laboratory operations. • Statistical concepts. • Reference intervals. • Method selection and evaluation • quality assurance and quality control • Proficiency testing and laboratory accreditation. **IV. Analytes:** Carbohydrates: 1) Regulation of glucose metabolism. 2) Laboratory findings in IDDM, NIDDM. 3) Metabolic complications of Diabetes Mellitus 4) Hypoglycemia. Lipid chemistry 1) Classification of lipoproteins and apolipoproteins. 2) Disorders of Lipoprotein metabolism. 3) Significance of apolipoproteins in health and disease. 4) Diagnosis of lipoprotein disorders. Amino acids and plasma proteins: 1)-Basic structure and metabolism. 2)-Amino acidopathies. 3)-General characteristics of plasma proteins.		

4)-General functions of plasma proteins. 5)-Acute phase proteins. 6)-Plasma proteins and disease. 7)-Benign versus malignant monoclonal gammopathy. 8)-Disorders of purine metabolism (primary and secondary gout). <u>Renal functions and non protein nitrogenous compounds:</u> 1) Biological function of the kidneys. 2) Glomerular and tubular functions and the clinical significance of their assessment. 3) Glomerular and tubular diseases. 4) Types of renal failure. 5) Clinical significance of total urine proteins, urine albumin, microalbuminuria, B_2 microglobulin, α1microglobulin, retinol binding protein and albumin / creatinine ratio. 6) Biosynthesis, metabolism and excretion. 7) Clinical and metabolic conditions associated with the increase or the decrease in their values. <u>Physiology and disorders of water, electrolytes and acid base metabolism</u>: 1) Total body water and electrolyte distribution and their clinical significance. 2) Electrolytes and their clinical significance. 3) Physiological buffer systems and their role in regulation of blood PH 4) Henderson Hasselbalch equation. 5) Conditions associated with abnormal acid- base states (Acidosis and alkalosis). <u>Enzymes:</u> 1- Classification, factors affecting their activity. 2- Hepatobiliary enzymes. 3- Cardiac enzymes.		

4- Pancreatic enzymes. 5- Bone enzymes Liver: 1) Biochemical functions of the liver. 2) Disorders of bilirubin metabolism and types of jaundice. 3) Clinical significance of enzyme assay in liver disease. 4) Disorders of the liver (acute and chronic hepatitis, cirrhosis, alcoholic, drug induced , metabolic, cholestatic, nutritional liver diseases, fatty liver, hepatic tumor, hepatocellular carcinoma, biliary tract diseases) 5) Diagnostic strategy of liver disease. <u>Cardiac markers:</u> 1) Tissue distribution of cardiac markers (CK,CKMB, LDH, troponin I, troponin T and myoglobin) 2) Clinical utility of cardiac markers in detection of acute myocardial infarction, minor myocardial injury and in monitoring reperfusion following thrombolytic therapy. <u>Mineral and bone metabolism</u>: 1) Hormonal and integrated control of mineral metabolism. 2) Function and clinical significance of minerals in bone metabolism. 3) Disorders of mineral metabolism (hypo&hypercalcaemia, hypo&hyper-phosphtaemia &hypo and hypermagnesemia). 4) Metabolic bone diseases (osteoporosis, osteomalacia, Paget s disease and renal osteodystrophy. 5) Clinical significance of biochemical markers of bone turnover.		

Gastric, pancreatic and intestinal functions: 1) Hormones and enzymes synthesized in gastrointestinal tract as well as their functions and clinical significance. 2) Neuroendocrine tumours: Gastrinoma, Zollinger Ellison syndrome and Vipoma. Endocrinology; . Synthesis, action and regulation of hypothalamic pituitary, adrenal, gonadal, thyroid and parathyroid hormones. . Clinical significance of hormone derangement. . Evaluation of the functional status of each gland. . Analytical assay of different hormones as: -T3, T4 &TSH. -Parathyroid hormones -Testosterone -ACTH,GH, LH, FSH, progesterone, estrogen& prolactin -Cortisol -insulin Disorders of thyroid gland Hyperthyroidism. Hypothyroidism. Non thyroidal illness. Disorders of adrenal gland Investigation of suspected adrenocortical hyper function. Investigation of suspected adrenocortical hypofunction . Congenital adrenal hypoplesia. Pheochromocytoma. Hypothalamic and pituitary hormones Anterior pituitary hormones (GH, PRO, FSH releasing hormones.) Posterior pituitary hormones (ADH). Gonadal function : Male gonadal function. Investigation of case of male infertility.		

Female gonadal function. Investigation of case of female infertility. Errors of amino, organic and fatty acids metabolism 1) Basic chemistry Biochemical diagnosis (prenatal- newborn screening and evaluation of symptomatic patients). 2) Disorders of amino, organic and fatty acids oxidation metabolism. Pregnancy: 1) Biochemical changes that take place in pregnancy. 2) Proteins and hormones produced by the placenta and their clinical significance. Vitamins and trace elements: 1) Classification. 2) Clinical manifestations of their deficiencies. Body fluid analysis: Clinical utility of testing the cerebrospinal fluid, serous, synovial, amniotic fluid and sweat. Analytes of haemoglobin metabolism and porphyrins 1) Synthesis, chemistry and clinical significance of haemoglobin, porphyrins and myoglobin. 2) Laboratory data associated with hemoglobinopathies and thalassaemia. Clinical chemistry of the geriatrics and pediatrics. 1) Establishing reference intervals for elderly and pediatrics. 2) Biochemical and physiological changes of aging. 3) Endocrine function changes. 4) Renal and hepatic function changes. 5) Lipid and enzyme changes		

Tumour markers: 1) Classification of tumour markers. 2) Clinical utilities of tumour marker Quality in clinical Chemistry laboratories		
B. Describe the etiology, clinical picture, and diagnosis of the following diseases and clinical conditions: **Carbohydrates:** 1) Regulation of glucose metabolism. 2) Laboratory findings in IDDM, NIDDM. 3) Metabolic complications of Diabetes Mellitus 4) Hypoglycemia. **Lipid chemistry** 1) Classification of lipoproteins and apolipoproteins. 2) Disorders of Lipoprotein metabolism. 3) Significance of apolipoproteins in health and disease. 4) Diagnosis of lipoprotein disorders. **Amino acids and plasma proteins:** 1)-Basic structure and metabolism. 2)-Amino acidopathies. 3)-General characteristics of plasma proteins. 4)-General functions of plasma proteins. 5)-Acute phase proteins. 6)-Plasma proteins and disease. 7)-Benign versus malignant monoclonal gammopathy. 8)-Disorders of purine metabolism (primary and secondary gout). **Renal functions and non protein nitrogenous compounds:** 1) Biological function of the kidneys. 2) Glomerular and tubular functions and the clinical significance of their assessment. 3) Glomerular and tubular diseases. 4) Types of renal failure.	-	

5) Clinical significance of total urine proteins, urine albumin, microalbuminuria, B_2 microglobulin, α1microglobulin, retinol binding protein and albumin / creatinine ratio. 6) Biosynthesis, metabolism and excretion. 7) Clinical and metabolic conditions associated with the increase or the decrease in their values. **Physiology and disorders of water, electrolytes and acid base metabolism:** 1) Total body water and electrolyte distribution and their clinical significance. 2) Electrolytes and their clinical significance. 3) Physiological buffer systems and their role in regulation of blood PH 4) Henderson Hasselbalch equation. 5) Conditions associated with abnormal acid- base states (Acidosis and alkalosis). **Enzymes:** 6- Classification, factors affecting their activity. 7- Hepatobiliary enzymes. 8- Cardiac enzymes. 9- Pancreatic enzymes. 10- Bone enzymes Liver: 1) Biochemical functions of the liver. 2) Disorders of bilirubin metabolism and types of jaundice. 3) Clinical significance of enzyme assay in liver disease. 4) Disorders of the liver (acute and chronic hepatitis, cirrhosis, alcoholic, drug induced , metabolic, cholestatic, nutritional liver diseases, fatty liver, hepatic tumor, hepatocellular carcinoma, biliary tract diseases) 5) Diagnostic strategy of liver disease. **Cardiac markers:** 1) Tissue distribution of cardiac markers (CK,CKMB, LDH, troponin I, troponin T and myoglobin) 2) Clinical utility of cardiac markers in detection		

of acute myocardial infarction, minor myocardial injury and in monitoring reperfusion following thrombolytic therapy. **<u>Mineral and bone metabolism</u>:** 1) Hormonal and integrated control of mineral metabolism. 2) Function and clinical significance of minerals in bone metabolism. 3) Disorders of mineral metabolism (hypo&hypercalcaemia, hypo&hyper-phosphtaemia &hypo and hypermagnesemia). 4) Metabolic bone diseases (osteoporosis, osteomalacia, Paget's disease and renal osteodystrophy. 5) Clinical significance of biochemical markers of bone turnover. **<u>Gastric, pancreatic and intestinal functions</u>:** 1) Hormones and enzymes synthesized in gastrointestinal tract as well as their functions and clinical significance. 2) Neuroendocrine tumours: Gastrinoma, Zollinger Ellison syndrome and Vipoma. **<u>Endocrinology;</u>** . Synthesis, action and regulation of hypothalamic pituitary, adrenal, gonadal, thyroid and parathyroid hormones. . Clinical significance of hormone derangement. . Evaluation of the functional status of each gland. . Analytical assay of different hormones as: -T3, T4 &TSH. -Parathyroid hormones -Testosterone -ACTH,GH, LH, FSH, progesterone, estrogen& prolactin -Cortisol -insulin **Disorders of thyroid gland** Hyperthyroidism. Hypothyroidism. Non thyroidal illness.		

Disorders of adrenal gland Investigation of suspected adrenocortical hyper function. Investigation of suspected adrenocortical hypofunction . Congenital adrenal hypoplesia. Pheochromocytoma. **Hypothalamic and pituitary hormones** Anterior pituitary hormones (GH, PRO, FSH releasing hormones.) Posterior pituitary hormones (ADH). **Gonadal function** : Male gonadal function. Investigation of case of male infertility. Female gonadal function. Investigation of case of female infertility. **Errors of amino, organic and fatty acids metabolism** 1) Basic chemistry Biochemical diagnosis (prenatal- newborn screening and evaluation of symptomatic patients). 2) Disorders of amino, organic and fatty acids oxidation metabolism. **Pregnancy:** 1) Biochemical changes that take place in pregnancy. 2) Proteins and hormones produced by the placenta and their clinical significance**.** **Vitamins and trace elements:** 1) Classification. 2) Clinical manifestations of their deficiencies. **Body fluid analysis:** Clinical utility of testing the cerebrospinal fluid, serous, synovial, amniotic fluid and sweat. **Analytes of haemoglobin metabolism and porphyrins** 1) Synthesis, chemistry and clinical significance of haemoglobin, porphyrins and myoglobin. 2) Laboratory data associated with		

hemoglobinopathies and thalassaemia. Clinical chemistry of the geriatrics and pediatrics 1) Establishing reference intervals for elderly and pediatrics. 2) Biochemical and physiological changes of aging. 3) Endocrine function changes. 4) Renal and hepatic function changes. 5) Lipid and enzyme changes Tumour markers: 1) Classification of tumour markers. 2) Clinical utilities of tumour mark		
C. State update and evidence based Knowledge of conditioned mentioned in A&B.		
D. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to clinical chemistry		
E. Mention the basic ethical and medicolegal principles revenant to the clinical chemistry.		
F. Mention the basics of quality assurance to ensure good clinical care in his field		
G. Mention the ethical and scientific principles of medical research		
H. State the impact of common health problems in the field of speciality on the society.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of basic with clinical reasoning and diagnosis of common diseases related to clinical chemistry.	Clinical rounds Senior staff experience Didactic (lectures, seminars,	Procedure/case presentation Log book Written, oral and practical examination

	tutorial)	
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to clinical chemistry.		
C. **Design and present** cases, seminars in common problem in clinical chemistry.		
D-Formulate management plans and alternative decisions in different situations in the field of the clinical chemistry.		

C -Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
a. Demonstrate an investigatory and analytic thinking approach to the following conditions: related to clinical chemistry I. Laboratory principles: * General laboratory techniques, procedures and safety. • Chemicals and related substances. • Centrifugation and weighing. • Volumetric equipments and its calibration. • Concept of solvent and solute • Buffer solution • Units of measurement. • Safety. *Specimen collection and other preanalytical variables. III. Analytical techniques and instrumentation: 1)Spectrophotometeric techniques *Explain the general principles of each analytic method. *Describe the operation and components parts of flame emission spectrophotometry and atomic absorption spectrophotometry, osmometer, ion selective electrode, PH electrode, electrophoresis and chemiluminescence's.	-Didactic; -Lectures -Clinical rounds -Seminars -Clinical rotations (service teaching)	**-log book & portfolio** **-MCQ examination** -formative assessment

RID, immune electrophoresis 2)Basic principles of radioactivity and its measurements. 3) Electrochemistry. • Potentiometry • Amperometry • Coulometry • conductometry 4)Chromatography / mass spectrometry: HPLC. Gas chromatography Mass spectrometry. 5) Automation in clinical laboratory *Explain the major steps in automated analysis *Operate properly on different instrumentation and auto analyzers. IV. Laboratory operations. • Statistical concepts. • Reference intervals. • Method selection and evaluation • quality assurance and quality control • Proficiency testing and laboratory accreditation. **IV. Analytes:** **1- Carbohydrates:** 1. Perform glucose tolerance test. 2. Glycated haemoglobin and fructoseamine measurement. 3. Detection of ketone bodies. 4. Microalbumin measurement. 5. Islet autoantibodies and insulin testing. **2) Lipids and lipoproteins** 1. Analytical assays of lipids, lipoproteins and apolipoproteins. **3) Proteins:** 1. Analytical methods for determination of total protein, albumin and protein fractionation. 2. Serum protein electrophoresis and immunofixation and describe the migration pattern of plasma proteins in health and disease.		

4) Renal functions: 1. Analytical methods, principles and procedures and other related parameters of kidney functions (urea, creatinine, uric acid and ammonia). 2. Physical, chemical and microscopic examination of urine. **5) Liver :** Measurement of bilirubin, proteins, albumin, A / G ratio, enzymes (ALT, AST, ALP, GGT, 5 nucleotidase). **6) Cardiac markers:** Analytical measurements of cardiac proteins and enzymes: Tryponin, CK, CK-MB and LDH **7) Mineral and bone metabolism:** Analytical assays of calcium, phosphorus and magnesium. **8) Physiology and disorders of water, electrolytes and acid base metabolism:** 1. Analytical techniques used to determine electrolyte concentrations. 2. Operating blood gas analyzers. **9) Endocrinology:** Analytical assays of different hormones - T3, T4 &TSH. -Parathyroid hormones -Testosterone -ACTH,GH, LH, FSH, progesterone, estrogen& prolactin -Cortisol -insulin 10) Tumour markers: α feto protein CEA CA19-9 CA-125 CA-15-3 Total and free PSA		

FBHCG **11) Pregnancy:** 1. Measurement of chorionic gonadotrophin and its subunits. 2. α Fetoprotein and amniotic fluid bilirubin and its subunits. **12) Body fluid analysis:** Physical, chemical and microscopic examination of these fluids (ascetic,CSF, pleural,synovial and other body fluids). **13) Analytes of haemoglobin metabolism and porphyrins:** 1. To be able to differentiate between haemoglobinuria and myoglobinuria. 2. Analysis of porphyrin precursors (PBG, ALA) in urine.		
B. **Recommend** the following non invasive diagnostic laboratory procedures in **1- Carbohydrates:** 1. Perform glucose tolerance test. 2. Glycated haemoglobin and fructoseamine measurement. 3. Detection of ketone bodies. 4. Microalbumin measurement. 5. Islet autoantibodies and insulin testing. **2) Lipids and lipoproteins** 1. Analytical assays of lipids, lipoproteins and apolipoproteins. **3) Proteins:** 1. Analytical methods for determination of total protein, albumin and protein fractionation. 2. Serum protein electrophoresis and immunofixation and describe the migration pattern of plasma proteins in health and disease. **4) Renal functions:** 1. Analytical methods, principles and procedures and other related parameters of kidney functions (urea, creatinine, uric acid and ammonia).	Clinical round with senior staff Observation Post graduate teaching Hand on workshops	-Procedure presentation - Log book - Chick list

2. Physical, chemical and microscopic examination of urine. **5)Liver :** Measurement of bilirubin, proteins, albumin, A / G ratio, enzymes (ALT, AST, ALP, GGT,5 nucleotidase). **6) Cardiac markers:** Analytical measurements of cardiac proteins and enzymes: Tryponin, CK, CK-MB and LDH **7) Mineral and bone metabolism:** Analytical assays of calcium, phosphorus and magnesium. **8) Physiology and disorders of water, electrolytes and acid base metabolism:** 1. Analytical techniques used to determine electrolyte concentrations. 2. Operating blood gas analyzers. **9) Endocrinology:** Analytical assays of different hormones -T3, T4 &TSH. -Parathyroid hormones -Testosterone -ACTH,GH, LH, FSH, progesterone, estrogen& prolactin -Cortisol -insulin 10) Tumour markers: α feto protein CEA CA19-9 CA-125 CA-15-3 Total and free PSA FBHCG **11) Pregnancy:** 1. Measurement of chorionic gonadotrophin and its subunits.		

2. α Fetoprotein and amniotic fluid bilirubin and its subunits. **12) Body fluid analysis:** Physical, chemical and microscopic examination of these fluids (ascetic,CSF, pleural,synovial and other body fluids). **13) Analytes of haemoglobin metabolism and porphyrins:** 1. To be able to differentiate between haemoglobinuria and myoglobinuria. 2. Analysis of porphyrin precursors (PBG, ALA) in urine.		
C. Interpret the following non invasive diagnostic laboratory procedures - mentioned in.C.B	Clinical round with senior staff	Procedure presentation - Log book - Chick list
D. Perform the following non invasive diagnostic laboratory procedures for *Disorders of carbohydrate metabolism. *Disorders of lipid metabolism. * Disorders of protein metabolism. * Disorders of renal function metabolism. * Disorders of liver function. * Disorders of cardiac function. * Disorders of mineral and bone metabolism. * Disorders of gastric, pancreatic and intestinal function. *Disorders of water and electrolytes and acid base metabolism. *Disorders of pituitary function. *Disorders of thyroid function. * Disorders of adrenal function. * Disorders of reproductive endocrine function. * Disorders of amino acids, fatty acids and organic acid metabolism. *Pregnancy and its complications. *Disorders of vitamins and trace elements.	Clinical round with senior staff -Perform under supervision of senior staff	Procedure presentation - Log book - Chick list

* Disorders of body fluid analysis. *Disorders of hemoglobin metabolism and porphyrins. *Clinical chemistry of geriatrics and pediatrics. *Tumor markers and its clinical applications.		
E. Carry out patient management plans for common conditions related to Clinical chemistry.	Clinical round with senior staff	
F. Use information technology to support patient care decisions and patient education in common clinical situations related to Clinical chemistry.		
G. Provide health care services aimed at preventing health problems related to Clinical chemistry. like: conditions mentioned in B.A.		
H-Provide patient-focused care in common conditions related to Clinical chemistry., while working with health care professionals, including those from other disciplines like: Conditions mentioned in B.A.		
I. Write competently all forms of professional reports related to the Clinical chemistry (lab reports).		

D - General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	-Case log -Observation and supervision -Written & oral communication	Procedure/case presentation -Log book and Portfolios
B. Appraises evidence from scientific studies(journal club)	Journal clubs - Discussions in seminars and clinical rounds	
C. Conduct epidemiological Studies and surveys.		

D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.	Clinical rounds Senior staff experience	

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain **diagnostic** and ethically sound relationship with patients.	Simulations Clinical round Seminars Lectures Case presentation Hand on workshops	Global rating Procedure/case presentation Log book Portfolios Chick list and
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case in common problems related to Immunology.	Clinical **(practical)**round Seminars	
K. Write a report in: -All investigations in immunology.	Senior staff experience	Chick list
L. Council patients and families about: -Viral hepatitis -Transmission of hepatitis C and B - HIV	Clinical round with senior staff	

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation Senior staff experience Case taking	1. Objective structured clinical examination 2. Patient survey
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		1. 360o global rating
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		1. Objective structured clinical examination 2. 360o global rating

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems.	Observation Senior staff experience	1. 360o global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		1. Check list evaluation of live or recorded performance
R. Assist patients in dealing with system complexities.		1. 360o global rating 2. Patient survey

Course 5; Unit (Module 2) Hematology

A-Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Illustrate the detailed of the following: * Normal Hematologic System: - Hematopoiesis - The Erythrocyte - Granulocytes and Monocytes - The lymphocytes - Normal Hemostasis - Red Cell immunohematology - Blood cell antigens and antibodies * Cell Biology *General aspects of Hematologic Malignancy * Bone marrow transplantation *. Disorders of Red Cells Disorders of iron metabolism and haem synthesis 1. Hemolytic anemias 2. Hereditary disorders of hemoglobin structure and synthesis 3. Other red cells disorders: (Aplastic anemia, megaloblastic anemia, bone marrow failure dyserythropoiesis), * Non malignant Disorders of Leukocytes and the Spleen * Hematologic malignancies 1. Acute Leukemias 2. Myeloproliferative disorders 3. Lymphoproliferative disorders 4. Plasma cell dyscrasias * Hematologic aspects of systemic diseases * Disorders of Hemostasis	-Lectures -Laboratory work	-Written, oral and practical examination **- Log book**

1. Introduction: Diagnostic approach to the bleeding disorders 2. Quantitative platelet disorders 3. Qualitative inherited and acquired platelet disorders 4. Vascular bleeding disorders 5. Inherited and acquired coagulation bleeding disorders 6. Fibrinolysis and its disorders 7. Thrombosis and antithrombotic therapy * BLOOD BANK 1. Blood cell antigens and antibodies and their in vitro interactions Clinical blood transfusion		
B-Describe the etiology, clinical picture, and diagnosis of the following diseases and clinical conditions: *. Disorders of Red Cells Disorders of iron metabolism and haem synthesis 1Hemolytic anemias 2Hereditary disorders of hemoglobin structure and synthesis 3Other red cells disorders: (Aplastic anemia, megaloblastic anemia, bone marrow failure dyserythropoiesis), * Non malignant Disorders of Leukocytes and the Spleen (4h) * Hematologic malignancies 1Acute Leukemias 2- Myeloproliferative disorders 3- Lymphoproliferative disorders 4- Plasma cell dyscrasias * Disorders of Hemostasis 1-Introduction: Diagnostic approach to the bleeding disorders 2-Quantitative platelet disorders 3-Qualitative inherited and acquired platelet	Didactic; -Lectures -Clinical rounds -Seminars -Clinical rotations (service teaching)	

disorders 4-Vascular bleeding disorders 5-Inherited and acquired coagulation bleeding disorders 6-Fibrinolysis and its disorders 7-Thrombosis and antithrombotic therapy Quality in hematology laboratories		
C. State update and evidence based Knowledge of conditioned mentioned in A &B.		
D. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to hematology		
E. Mention the basic ethical and medicolegal principles revenant to the hematology		
F. Mention the basics of quality assurance to ensure good clinical care in hematology		
G. Mention the ethical and scientific principles of medical research		
H. State the impact of common health problems in the field of speciality on the society.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning and diagnosis of common diseases related to **hematology.**	Didactic (lectures, seminars, tutorial)	-Written, oral and practical examination
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to **hematology.**		
C. **Design and present** cases , seminars in common problem of hematology		
D-Formulate management plans and alternative decisions in different situations in the field of the hematology.		

C- Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Demonstrate an investigatory and analytic thinking approach to the following conditions: related to hematology mentioned in AA,AB	-Didactic; -Lectures -Clinical rounds -Seminars -Clinical rotations (service teaching)	**-log book & portfolio** **-MCQ examination** -formative assessment
B. Recommend the following non invasive/invasive diagnostic procedures 1. Collection and handling of blood 2. Basic hematological techniques: -Manual CBC, reticulocyte estim., ESR -Automated hematology and interpretation of CBC reports 3. Preparation and staining of blood and bone marrow films 4. Bone marrow aspiration and biopsy 5. Blood cell morphology in health and disease 6. Blood Parasite 7. Investigations and differential diagnosis of anemias: A- non-hemolytic: - Iron profile (IDA-overload) B-hemolytic: *Membrane and enzyme def, 1- Osmotic fragility test 2-screening for G6PD def. * Abnormal HB and thalassemia Invest. 1-HB electropheresis (interpret)	Clinical round with senior staff Observation Post graduate teaching Hand on workshops	Procedure presentation - Log book - Chick list

2-Quantitation of HB F & A2 3- Sickling test 8. Cytochemical staining techniques 9. Classification of leukemias (acute, chronic)- case study 10. Laboratory approach to the diagnosis and classification of blood diseases 11. CASE PRESENTATION 12. Laboratory practice, safety, assurance 13. Recent techniques: 1. immunophenotyping techniques 2. cytogenetic techniques 3. molecular techniques HEMOSTASIS 1. Laboratory approach to the diagnosis and classification of bleeding tendency 2. Screening tests of hemostasis 3. platelet function tests 4. coagulation factors & vWF assay 5. Invest. Of thrombophilia Laboratory control of antithrombotictherapy BLOOD BANK 1. ABO and RH – D Grouping 2. Ab screening & identification (Coomb's Test: DAT & IAT) 3. Cross matching 4. diagnosis of transfusion reactions 5. transfusion therapy techniques -Red cell wash - Separation of components *manual *automated		
b. Interpret the following non	Clinical round with	Procedure presentation

invasive/invasive diagnostic procedures -All tests mentioned in.C.D - immunophenotyping techniques - cytogenetic techniques - molecular techniques	senior staff	- Log book
D.Perform the following non invasive/invasive diagnostic procedures mentioned 1. SAMPLING & BLOOD HANDLING -Techniques -Precautions -Anticoagulants 2- CBC (Manual) Hb estimation, Hematocrite T.L.C., Platelets, Blood smear staining and examination 3- RETICULOCYTE STAINING &COUNTING 4- ESR 5- AUTOMAED BLOOD COUNTING & INTERPRETATION 6- INVESTIGATIONS OF ANEMIAS: 1) Iron profile 2) Osmotic fragility test 3) Screening test for G6PD deficiency 4) Sickling test 5) Hb F &A2 estimation 6) Hb electrophoresis 7) Erythropoietin assay 7- BLOOD PARASITES 8- CYTOCHEMICAL STAINING: • Myeloperoxidase • Sudan black • PAS	Clinical round with senior staff -Perform under supervision of senior staff	Procedure presentation - Log book - Chick list

• NAP • Acid Phosphatase • Esterase • Others 9- BONE MARROW - Aspiration - Trephine Biopsy 10- CASE PRESENTATION 11-SCREENING TESTS OF HEMOSTASIS: - Bleeding time - PT& INR - PTT - Thrombin Time - Fibrinogen assay - FDP 12- Coagulation factors - vWF ASSAY 13- Platelet function tests 14- Investigations of thrombophilia 15- BLOOD BANKING 1-ABO grouping 2- RH typing 3-Cross matching 4- Coomb's test 5- Ab screening & Identification 6- Storage of blood 16- BLOOD TRANSFUSION 1- Red cell wash 2- Separation of components - Manual - auomated		
E. Carry out patient management plans for common conditions related to hematology.		
F. Use information technology to support patient care decisions and patient education in common clinical situations related to		

hematology		
G.Provide health care services aimed at preventing health problems related to hematology like:		
H. Provide patient-focused care in common conditions related to hematology, while working with health care professionals, including those from other disciplines like		
I. Write competently all forms of reports related to the hematology, (lab reports).		

D- General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	-Case log -Observation and supervision -Written & oral communication	Procedure/case presentation -Log book and Portfolios
B. Appraises evidence from scientific studies(journal club)	-Journal clubs - Discussions in seminars and clinical rounds	
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.	Clinical rounds Senior staff experience	

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain **diagnostic** and ethically sound relationship with patients.	Simulations Clinical round Seminars Lectures Case presentation Hand on workshops	Global rating Procedure/case presentation Log book Portfolios Chick list and
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case in common problems related to hematology	Practical round Seminars	practical Exam
K. Write a report in all tests mentioned in B.C	Senior staff experience	Chick list
L. Council patients and families about conditioned in hematology	Clinical round with senior staff	

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation Senior staff experience Case taking	1. Objective structured clinical examination 2. Patient survey
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		360o global rating
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		1. Objective structured clinical examination 2. 360o global rating

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems.	Observation Senior staff experience	1. 360o global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		1. Check list evaluation of live or recorded performance
R. Assist patients in dealing with system complexities.		1. 360o global rating 2. Patient survey

Course 5; Unit (Module 3) Immunology

A-Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. **Outline** the details of the following: -Hypersensitivity Types -type I immediate hypersensitivity - type II antibody mediated hypersensitivity - type III immune complex mediated Hypersensitivity - type IV cell mediated hypersensitivity Congenital Immunodeficiency Tumor Immunology Transplantation Immunology	Didactic; -Lectures -Practical rounds -Seminars -practical rotations (service teaching)	**-OSCE at the end of each year** **-log book & portfolio** **- MCQ examination at the second year** **-Oral and written exam**
B. Describe the etiology, clinical picture, and diagnosis of the following diseases and clinical conditions: -Hypersensitivity Types -type I immediate hypersensitivity - type II antibody mediated hypersensitivity - type III immune complex mediated Hypersensitivity - type IV cell mediated hypersensitivity Congenital Immunodeficiency Tumor Immunology Transplantation Immunology		
C. State update and evidence based Knowledge of conditioned mentioned in A &B		
D. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to Immunology		

E. Mention the basic ethical and medicolegal principles revenant to the immunology.		
F. Mention the basics of quality assurance to ensure good clinical care in Immunology		
G. Mention the ethical and scientific principles of medical research		
-H. State the impact of common health problems in the field of Immunology on the society.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning and diagnosis of common diseases related to **Immunology.**	Clinical rounds Senior staff experience	Procedure/case presentation Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Immunology.		
C. Design and present cases , seminars in common problem of immunology		
D-Formulate management plans and alternative decisions in different situations in the field of the Immunology.		

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Demonstrate an investigatory and analytic thinking approach to the following conditions: related to immunology mentioned in AA,AB	-Didactic; -Lectures -Clinical	**OSCE at the end of each year**

	rounds -Seminars -Clinical rotations (service teaching)	**-log book & portfolio** **- One MCQ examination at the second half of the second year and another one in the third year**
B. **Recommend** the following non invasive diagnostic laboratory procedures - Screening test for hypersensitivity and detection of different allergens. - Tissue typing. - Phagocytic function.	Clinical round with senior staff Observation Post graduate teaching Hand on workshops	-Procedure presentation - Log book - Chick list
C. Interpret the following non invasive diagnostic laboratory procedures - Screening test for hypersensitivity and detection of different allergens. - Tissue typing. - Phagocytic function.	Clinical round with senior staff	Procedure presentation - Log book - Chick list
D. Perform the following non invasive diagnostic laboratory procedures -- RIBA test -Separation of lymphocytes - Counts of T cells - Counts of B cells - Flowcytometry -Qualitative PCR	Clinical round with senior staff -Perform under supervision of senior staff	Procedure presentation - Log book - Chick list
E**.** Carry out patient management plans for common conditions related to Immunology.	Clinical round with senior	

	staff	
F. Use information technology to support patient care decisions and patient education in common clinical situations related to Immunology.		
G.Provide health care services aimed at preventing health problems related to Immunology like: conditioned mentioned in A.A.		
H-Provide patient-focused care in common conditions related to Immunology, while working with health care professionals, including those from other disciplines like: Conditions mentioned in B.A.		
I. Write competently all forms of reports related to the Immunology, (lab reports).		

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	-Case log -Observation and supervision -Written & oral communication	Procedure/case presentation -Log book and Portfolios
B. Appraises evidence from scientific studies(journal club)	Journal clubs - Discussions in seminars and clinical rounds	
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.	Clinical rounds Senior staff experience	

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain **diagnostic** and ethically sound relationship with patients.	Simulations Clinical round Seminars Lectures Case presentation Hand on workshops	Global rating Procedure/case presentation Log book Portfolios Chick list
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case in common problems related to Immunology.	Clinical **(practical)**round Seminars	
K. Write a report in: -All investigations in immunology.	Senior staff experience	Chick list
L. Council patients and families about: -Viral hepatitis -Transmission of hepatitis C and B - HIV	Clinical round with senior staff	

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation Senior staff experience Case taking	**1. Objective structured clinical examination** **2. Patient survey**
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		**1. 360o global rating**

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems.	Observation Senior staff experience	360o global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		Check list evaluation of live or recorded performance
R. Assist patients in dealing with system complexities.		- 360o global rating - Patient survey

Course 5; Unit (Module 4) Microbiology

A-Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Illustrate the detailed of the following: -Pyrexia of unknown origin. -Septicemia and bacteremia -upper and lower respiratory tract infections , Ear and eye infection -GIT infections -Genitourinary tract infection -Sexually transmitted diseases - Nosocomial infection and infection control	-Lectures -Laboratory work, tutorial, journal club, case presentation, Conference,	-Written, oral and practical examination **- Log book**
B. Describe the etiology, clinical picture, and diagnosis of the following diseases and clinical conditions associated with: -Pyrexia of unknown origin. -Septicemia and bacteremia -Upper and lower respiratory.tract infections ,Ear and eye infection -GIT infections -Genitourinary tract infection -Sexually transmitted diseases - Nosocomial infection and infection control		
C. State update and evidence based Knowledge of conditioned mentioned in A &B		
D. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to Microbiology		
E. Mention the basic ethical and medicolegal principles revenant to the microbiology		
F. Mention the basics of quality assurance to ensure good clinical care in microbiology		
G. Mention the ethical and scientific principles of medical research		
H. State the impact of common health problems in the field of speciality on the society.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of basic bacteriology with clinical reasoning and diagnosis of common diseases related to **microbiology.**	Didactic (lectures, seminars, tutorial)	-Written, oral and practical examination
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to microbiology.		
C. **Design and present** cases , seminars in common problem in microbiology		
D-Formulate management plans and alternative decisions in different situations in the field of the microbiology		

C- Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Demonstrate an investigatory and analytic thinking approach to the following conditions: related to microbiology mentioned in AA,AB	Clinical round with senior staff Observation Post graduate teaching Hand on workshops	Procedure presentation - Log book - Chick list
B. Recommend the following non invasive diagnostic procedures 1.Sampling and Specimens collection: Blood, Urine, Pus, Sputum, Stool and biological fluid --Techniques - Precautions - Containers 2- Transportation and Processing of Specimens: Blood, Urine, Pus, Sputum, Stool and biological fluids 3-Staining procedures: -Gram stain -Ziehl-Neelsen stain		

- Fluorescent stains 4-Media preparation -Nutrient -Blood -Chocolate -MacConkey -Manitol- salt -Eosin Methylene Blue -CLED 5- culture of different specimens -Blood - CSF -Wound - Urine -Sputum -Stool - Biological fluid 6-Isolation and identification of aerobic organisms 7- Culture of anaerobe -Techniques -Precautions - Container 8- Antibiogram 9-Tuberculosis: -Direct smear microscopy -Z-N preparation -Culture on LJ -Identification of strains -Interpretation -Drug susceptibility -New methods: PCR -Advanced Techniques : -PCR -PCR- RFLP - Automation in Microbiology : VITEK2 BACT/ALERT		
C. Interpret the following non invasive diagnostic procedures mentioned in C.B		

D. Perform the following non invasive/invasive diagnostic procedures mentioned in C.B		
E. Carry out patient management plans for common conditions related to microbiology.		
F. Use information technology to support patient care decisions and patient education in common clinical situations related to microbiology		
G. Provide health care services aimed at preventing health problems related to infectious diseases		
H. Provide patient-focused care in common conditions related to microbiology, while working with health care professionals, including those from other disciplines		
I. Write competently all forms of reports related to the microbiology, (lab reports).		

D- General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	-Case log -Observation and supervision -Written & oral communication	Procedure/case presentation -Log book and Portfolio
B. Appraises evidence from scientific studies(journal club)	-Journal clubs - Discussions in seminars and clinical rounds	
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.	Clinical rounds Senior staff experience	

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain diagnostic and ethically sound relationship with patients.	Simulations Clinical round Seminars Lectures Case presentation Hand on workshops	Global rating Procedure/case presentation Log book Portfolios Chick list and
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case in Microbiology	Practical round Seminars	practical Exam
K. Write a report in all investigations mentioned in C.B.	Senior staff experience	
L. Council patients and families about conditioned mentioned in B.A.	Clinical round with senior staff	

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation Senior staff experience Case taking	1. Objective structured clinical examination 2. Patient survey

N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		1. 360o global rating
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		1. Objective structured clinical examination 2. 360o global rating

Systems-Based Practice

ILOs	**Methods of teaching/ learning**	**Methods of Evaluation**
P. Work effectively in relevant health care delivery settings and systems.	Observation Senior staff experience	360o global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		Check list evaluation of live or recorded performance
R. Assist patients in dealing with system complexities.		- 360o global rating - Patient survey

4. Course contents (topic s/modules/rotation
Course Matrix

Time Schedule: Second part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skill	General Skills
Unit (Module 1) Clinical Chemistry				
Carbohydrates	**A-H**	**A-D**	**A-I**	**A-R**
Lipid chemistry	**A-H**	**A-D**	**A-I**	**A-R**
Amino acids and plasma proteins	**A-H**	**A-D**	**A-I**	**A-R**
Renal functions and non protein nitrogenous compounds	**A-H**	**A-D**	**A-I**	**A-R**
Physiology and disorders of water, electrolytes and acid base metabolism	**A-H**	**A-D**	**A-I**	**A-R**
Enzymes	**A-H**	**A-D**	**A-I**	**A-R**
Liver	**A-H**	**A-D**	**A-I**	**A-R**
Cardiac markers	**A-H**	**A-D**	**A-I**	**A-R**
Mineral and bone metabolism	**A-H**	**A-D**	**A-I**	**A-R**
Gastric, pancreatic and intestinal functions	**A-H**	**A-D**	**A-I**	**A-R**
Endocrinology	**A-H**	**A-D**	**A-I**	**A-R**
Errors of amino, organic and fatty acids metabolism	**A-H**	**A-D**	**A-I**	**A-R**
Pregnancy	**A-H**	**A-D**	**A-I**	**A-R**
Vitamins and trace elements	**A-H**	**A-D**	**A-I**	**A-R**
Body fluid analysis	**A-H**	**A-D**	**A-I**	**A-R**
Analytes of hemoglobin metabolism and porphyrins	**A-H**	**A-D**	**A-I**	**A-R**
Clinical chemistry of the geriatrics and pediatrics	**A-H**	**A-D**	**A-I**	**A-R** **P-R**
Tumor markers	**A-H**	**A-D**	**A-I**	**A-R**
Unit (Module 2) Hematology				
Normal hematologic system	**A-H**	**A-D**	**---**	**A-C**
Disorders of red cells	**A-H**	**A-D**	**A-I**	**A-R**
Non malignant disorders of leukocytes and the spleen	**A-H**	**A-D**	**A-I**	**A-R**

Hematologic malignancies	**A-H**	**A-D**	**A-I**	**A-R**
Disorders of haemostasis	**A-H**	**A-D**	**A-I**	**A-R**
Transfusion medicine	**A-H**	**A-D**	**A-I**	**A-R**
Laboratory hematology and diagnostic approach to	**A-H**	**A-D**	**A-I**	**A-R**
Miscellaneous	**A-H**	**A-D**	**A-I**	**A-R**
Unit (Module 3) Immunology				
Clinical transplantation	**A**	**A**	**---**	**A-C**
Immune response to viral infection	**A**	**A**	**---**	**A-C**
Congenital immunodeficiency diseases	**A**	**A**	**---**	**A-C**
Tumor immunology	**A**	**A**	**---**	**A-C**
Unit (Module 4) Microbiology				
Laboratory strategy in diagnosis of bacterial infections	**A-H**	**A-D**	**A-I**	**A-K P-R**
Gram positive cocci	**A-H**	**A-D**	**A-I**	**A-K P-R**
Gram negative cocci	**A-H**	**A-D**	**A-I**	**A-K P-R**
Gram positive rods	**A-H**	**A-D**	**A-I**	**A-K P-R**
Gram negative rods	**A-H**	**A-D**	**A-I**	**A-K P-R**
Spirochaetes	**A-H**	**A-D**	**A-I**	**A-K P-R**
Poorly gram staining organisms	**A-H**	**A-D**	**A-I**	**A-K P-R**
Technologic advances in clinical microbiology	**A-H**	**A-D**	**A-I**	**A-K P-R**
Sterilization techniques	**A-H**	**A-D**	**A-I**	**A-K P-R**
Nosocomial infection	**A-H**	**A-D**	**A-I**	**A-K P-R**

5. Course Methods of teaching/learning:

1-Didactic: Lectures.
2-Seminars.
3-Service teaching.
4-Post graduate teaching
5-hand on work shops
6-Case presentation
7-Simulations

6. Course Methods of teaching/learning: for students with poor achievements

1-Didactic: Lectures.

2-Seminars.

3-Service teaching.

4-Post graduate teaching

5-hand on work shops

6-Case presentation

7-Simulations

7. Course assessment methods:

i. Assessment tools:

- Clinical examination
- Written and oral examination
- Chick list
- log book & portfolio
- Procedure/case presentation
- MCQ examination
- Objective structured clinical examination
- Check list evaluation of live or recorded performance
- Patient survey
- 360o global rating

ii. Time schedule: at end of second part
iii. Marks: 1200 marks
Written exam 500 marks,
Oral exam 200 marks,
Clinical &practical exam 480 mark

8. List of references

i. Lectures notes

Staff members print out of lectures and/or CD copie

ii. Essential books

- Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics 8th Edition - June 22, 2018.
Contemporary Practice in Clinical Chemistry Fourth Edition 2020.Postgraduate Haematology 8th Edition, Kindle Edition
- Hoffbrand's Essential Haematology, 8th Edition 2019
- Anderson's Atlas of Hematology 3rd Edition 2022.
- Dacie and Lewis Practical Haematology Book • Twelfth Edition • 2017 "
- Basic immunology ,By E. R. Gold, D. B. Peacock,4th edition,2014.
- Basic and clinical immunologyy Mark Peakman, Diego Vergani,2nd edition,2009.
- Cellular and Molecular Immunology ,By Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai .EIGHTH EDITION,2012.

- Jawetz medical microbiology **Jawetz Melnick & Adelbergs Medical Microbiology 28 E,** Stefan Riedel, Stephen A. Morse, Timothy A. Mietzner, Steve MillerMcGraw Hill Professional, Aug 25, 2019 - ,LANGE

iii. Recommended books

1- Clinical Chemistry: Principles, Techniques and Correlations -1-

by Michael L. Bishop, M.D. Fody, Edward P., et al. |7th edition, Feb 26, 2013

2- Zilva Clinical chemistry and metabolic medicine by Martin Crook | Oct 5, 2006.

3-Marshall Clinical chemistry.By William J. Marshall, Márta Lapsley, Andrew Day, Kate Shipman,9th edition,2021.

4- Wintrobe's clinical hematology by John P. Greer, Daniel A. Arber, Bertil Glader, Alan F. List, Robert T. Means, Frixos Paraskevas, George M. Rodgers,13th edition,2014.Wolters Kluwer Health.

5- Williams Hematology,Marshall A. Lichtman, Kenneth Kaushansky, Josef T. Prchal, Marcel M. Levi, Linda J. Burns, David C. Linch, McGraw-Hill Education, 10th edition, Mar 17, 2021 - Medical

6- **-Medical Immunology, 7th Edition edited by Gabriel Virella,2020.**

7- Diagnostic Microbiology (Koneman**),**edited by Elmer W. Koneman,7th edition,2017.

iv. Periodicals, Web sites, … etc

- Journal of Clinical Chemistry
- Molecular and cellular endocrinology
- Atherosclerosis
- American journal of hematology
- Journal of hematology oncology
- Journal of thrombosis and hemostasis
- Blood
- Hematologica
- Egyptian journal of immunology
- The journal of immunology
- Journal of clinical immunology
- Journal of Clinical Microbiology
- Clinical Microbiology reviews
- Journal of Bacteriology

v. Others : None

9. Signatures

Course Coordinator: **Prof. Dr Eman Naser.**	**Head of the Department:** **Prof Dr Azza Mahmoud Ezz EL**
Date:	**Date:**

ANNEX 2
Program Academic Reference Standards (ARS)

1- Graduate attributes for master degree in Clinical pathology

***The Graduate (after residence training and master degree years of study) must*:**

1- Have the capability to be a scholar, understanding and applying basics, methods and tools of scientific research and clinical audit ***in Clinical pathology.***

2- Appraise and utilise scientific knowledge to continuously update and improve clinical practice in related speciality.

3- Acquire sufficient medical knowledge in the basic biomedical, clinical, behavioural and clinical sciences, medical ethics and medical jurisprudence and apply such knowledge in patient care in the field of ***Clinical pathology***.

4- Provide patient care that is appropriate, effective and compassionate for dealing with common health problems and health promotion using evidence-based and updated information.

5- Identify and share to solve health problems in his speciality.

6- Acquire all competencies –including the use of recent technologies- that enable him to provide safe, scientific, and ethical and evidence based clinical care including update use of new technology in ***Clinical pathology***.

7- Demonstrate interpersonal and communication skills that ensure effective information exchange with individual patients and their families and teamwork with other health professions, the scientific community and the public.

8- Function as supervisor, and trainer in relation to colleagues, medical students and other health professions.

9- Acquire decision making capabilities in different situations related to ***Clinical pathology.***

10- Show responsiveness to the larger context of the health care system, including e.g. the organisation of health care, partnership with health care providers and managers, practice of cost-effective health care, health economics, and resource allocations.

11- Be aware of public health and health policy issues and share in system-based improvement of health care.

12- Show appropriate attitudes and professionalism.

13- Demonstrate skills of lifelong learning and maintenance of competence and ability for continuous medical education and learning in subsequent stages in ***Clinical pathology*** or one of its subspecialties.

2- - Competency based Standards for clinical master degree graduates in clinical pathology

2.1- Knowledge and understanding

By the end of the program, the graduate should demonstrate satisfactory knowledge and understanding of

2-1-A- Established basic, biomedical, clinical, epidemiological and behavioral sciences related conditions, problem and topics.

2-1-B- The relation between good clinical care of common health problems in the speciality and the welfare of society.

2-1-C- Up to date and recent developments in common problems related to ***Clinical pathology***

2-1-D- Ethical and medicolegal principles relevant to practice in ***Clinical pathology***

2-1-E -Quality assurance principles related to the good medical practice in ***Clinical pathology***

2-1-F- Ethical and scientific basics of medical research.

2.2- Intellectual skills:

By the end of the program, the graduate should be able to demonstrate the following:

2-2-A- Correlation of different relevant sciences in the problem solving and management of common diseases of ***Clinical pathology.***

2-2-B- Problem solving skills based on data analysis and evaluation (even in the absence of some) for common clinical situations related to ***Clinical pathology.***

2.2- C- Demonstrating systematic approach in studying clinical problems relevant to ***Clinical pathology***.

2-2-D- Making alternative decisions in different situations in ***Clinical pathology***.

2.3- Clinical skills

By the end of the program, the graduate should be able to

2-3-A - Provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

2-3-B- Demonstrate patient care skills relevant to ***Clinical pathology*** for patients with common diseases and problems.

2-3- C- Write and evaluate reports for situations related to the field of ***Clinical pathology.***

2.4- General skills

By the end of the program, the graduate should be able to

- ***Competency-based outcomes for Practice-based Learning and Improvement***

2-4-A- Demonstrate practice-based learning and improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence,, improvements in patient care and risk management.

2-4-B- Use all information sources and technology to improve his practice.

2-4-C- Demonstrate skills of teaching and evaluating others.

- ***Competency-based objectives for Interpersonal and Communication Skills***

2-4-D- Demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals.

- ***Competency-based objectives for Professionalism***

2-4-E- Demonstrate professionalism behaviors, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

- ***Competency-based objectives for Systems-based Practice***

2-4-F- Demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively use system resources to provide care that is of optimal value.

2-4-g- Demonstrate skills of effective time management.

2-4-H- Demonstrate skills of self and continuous learning.

Annex 3, Methods of teaching/learning

Annex 3, Methods of teaching/learning

	Patient care	**Medical knowledge**	**Practice-based learning/ Improvement**	**Interpersonal and communication skills**	**Professionalism**	**Systems-based practice**
Didactic (lectures, seminars, tutorial)	X	X		X	X	X
journal club,	X	X	X			
Educational prescription	X	X	X	X	X	X
Present a case (true or simulated) in a grand round	X	X	X	X	X	
Observation and supervision	X		X	X	X	X
conferences		X	X	X		X
Written assignments	X	X	X	X	X	X
Oral assignments	X	X	X	X	X	X

Teaching methods for knowledge

- ❖ Didactic (lectures, seminars, tutorial)
- ❖ journal club
- ❖ Critically appraised topic
- ❖ Educational prescription (a structured technique for following up on clinical questions that arise during rounds and other venues).
- ❖ Present a case (true or simulated) in a grand round
- ❖ Others

Teaching methods for patient care

- ❖ Observation and supervision /Completed tasks procedure/case logs
- ❖ On-the-job" training without structured teaching is not sufficient for this skill (checklists).
- ❖ Simulation is increasingly used as an effective method for skill/ teamwork training.

Teaching methods for other skills

- ❖ Written communication (e.g., orders, progress note, transfer note, discharge summary, operative reports, and diagnostic reports).

- ❖ Oral communication (e.g., presentations, transfer of care, interactions with patients, families, colleagues, members of the health care team) and/or non verbal skills (e.g., listening, team skills)

- ❖ Professionalism, including medical ethics, may be included as a theme throughout the program curriculum

that includes both didactic and experiential components (e.g., may be integrated into already existing small group discussions of vignettes or case studies and role plays, computer-based modules) and may be modeled by the faculty in clinical practice and discussed with the resident as issues arise during their clinical practice.

Annex 4, Assessment methods

Annex 4, ILOs evaluation methods for Master Degree students.

Method	Practical skills	K	Intellectual	General skills			
	Patient care	K	I	Practice-based learning/ Improvement	Interpersonal and communication skills	Professionalism	Systems-based practice
Record review	X	X	X		X	X	X
Checklist	X				X		
Global rating	X	X	X	X	X	X	X
Simulations	X	X	X	X	X	X	
Portfolios	X	X	X	X	X		
Standardized oral examination	X	X	X	X	X		X
Written examination	X	X	X	X			X
Procedure/ case log	X	X					
OSCE	X	X	X	X	X	X	X

Annex 4, Glossary of Master Degree doctors assessment methods

- Record Review – Abstraction of information from patient records, such as medications or tests ordered and comparison of findings against accepted patient care standards.
  - Chart Stimulated Recall – Uses the MSc doctor's patient records in an oral examination to assess clinical decision-making.
  - Mini clinical evaluation: Evaluation of Live/Recorded Performance (single event) – A single resident interaction with a patient is evaluated using a checklist. The encounter may be videotaped for later evaluation.
  - Standardized Patients (SP) – Simulated patients are trained to respond in a manner similar to real patients. The standardized patient can be trained to rate MSc doctor's performance on checklists and provide feedback for history taking, physical examination, and communication skills. Physicians may also rate the MSc doctor's performance.
  - Objective Structured Clinical Examination (OSCE) – A series of stations with standardized tasks for the MSc doctors to perform. Standardized patients and other assessment methods often are combined in an OSCE. An observer or the standardized patient may evaluate the MSc doctors.
  - Procedure or Case Logs – MSc doctors prepare summaries of clinical experiences including clinical data. Logs are useful to document educational experiences and deficiencies.
  - PSQs – Patients fill out Patient Survey questionnaires (PSQs) evaluating the quality of care provided by a MSc doctors.
  - Case /problems – assess use of knowledge in diagnosing or treating patients or evaluate procedural skills.
  - Models: are simulations using mannequins or various anatomic structures to assess procedural skills and

interpret clinical findings. Both are useful to assess practice performance and provide constructive feedback.

- 360 Global Rating Evaluations – MSc doctors, faculty, nurses, clerks, and other clinical staff evaluate MSc doctors from different perspectives using similar rating forms.
- Portfolios – A portfolio is a set of project reports that are prepared by the MSc doctors to document projects completed during the MSc study years. For each type of project standards of performance are set. Example projects are summarizing the research literature for selecting a treatment option, implementing a quality improvement program, revising a medical student clerkship elective, and creating a computer program to track patient care and outcomes.
- Examination MCQ – A standardized examination using multiple-choice questions (MCQ). The in-training examination and written board examinations are examples.
- Examination Oral – Uses structured realistic cases and patient case protocols in an oral examination to assess clinical decision-making.
- Procedure or Case Logs – MSc doctors prepare summaries of clinical experiences including clinical data. Logs are useful to document educational experiences and deficiencies.
- PSQs – Patients fill out Patient Survey questionnaires (PSQs) evaluating the quality of care provided by MSc doctors.

Annex 5, Program evaluation tools

By whom	Method	Sample
Quality Assurance Unit	Reports Field visits	#
External Evaluator (s):According to department council External Examiner (s): According to department council	Reports Field visits	#
Stakeholders	Reports Field visits Questionnaires	#
Senior students	Questionnaires	#
Alumni	Questionnaires	#

Annex 6, Program Correlations:

مصفوفة توافق المعايير القومية القياسية العامة لبرامج الماجستير مع المعايير الأكاديمية المعتمدة من كلية الطب □ جامعة أسيوط لدرجة الماجستير في الباثولوجيا الاكلينيكية

I- General Academic Reference Standards (GARS) versus Program ARS

1- Graduate attributes

Faculty ARS	NAQAAE General ARS for Postgraduate Programs
1- Have the capability to be a scholar, understanding and applying basics, methods and tools of scientific research and clinical audit in *Clinical pathology*	1- إجادة تطبيق أساسيات و منهجيات البحث العلمي واستخدام أدواته المختلفة
2- Appraise and utilise scientific knowledge to continuously update and improve clinical practice in *Clinical pathology*	2-تطبيق المنهج التحليلي واستخدامه في مجال التخصص
3- Acquire sufficient medical knowledge in the basic biomedical, clinical, behavioural and clinical sciences, medical ethics and medical jurisprudence and apply such knowledge in patient care in *Clinical pathology.*	3-تطبيق المعارف المتخصصة و دمجها مع المعارف ذات العلاقة في ممارسته المهنية
4- Provide patient care that is appropriate, effective and compassionate for dealing with common health problems and health promotion using evidence-based and update information.	4-إظهار وعيا بالمشاكل الجارية و الرؤى الحديثة في مجال التخصص
5- Identify and share to solve health problems in *Clinical pathology*	5-تحديد المشكلات المهنية و إيجاد حلولا لها
6- Acquire all competencies that enable him to provide safe, scientific, ethical and evidence based clinical care including update use of new technology in *Clinical pathology*.	6-إتقان نطاق مناسب من المهارات المهنية المتخصصة، واستخدام الوسائل التكنولوجيةالمناسبة بما يخدم ممارسته المهنية

7- Demonstrate interpersonal and communication skills that ensure effective information exchange with individual patients and their families and teamwork with other health professions, the scientific community and the public. 8- Function as supervisor, and trainer in relation to colleagues, medical students and other health professions.	7–التواصل بفاعلية و القدرة على قيادة فرق العمل
9- Acquire decision making capabilities in different situations related to *Clinical pathology*	8–اتخاذ القرار في سياقات مهنية مختلفة
10- Show responsiveness to the larger context of the health care system, including e.g. the organisation of health care, partnership with health care providers and managers, practice of cost-effective health care, health economics, and resource allocations.	9– توظيف الموارد المتاحة بما يحقق أعلي استفادة و الحفاظ عليها
11- Be aware of public health and health policy issues and share in system-based improvement of health care.	10–إظهار الوعي بدوره في تنمية المجتمع و الحفاظ على البيئة في ضوء المتغيرات العالمية و الإقليمية
12- Show appropriate attitudes and professionalism.	11–التصرف بما يعكس الالتزام بالنزاهة و المصداقية و الالتزام بقواعد المهنة
13- Demonstrate skills of lifelong learning and maintenance of competence and ability for continuous medical education and learning in subsequent stages in *Clinical pathology* or one of its subspecialties.	12–تنمية ذاته أكاديميا و مهنيا و قادرا علي التعلم المستمر

2. Academic standard

Faculty ARS	NAQAAE General ARS for Postgraduate Programs
2.1.A -Established basic, biomedical, clinical, epidemiological and behavioral sciences related conditions, problems and topics.	2-1-أ-النظريات و الأساسيات المتعلقة بمجال التعلم وكذا في المجالات ذات العلاقة.
2.1.B- The relation between good clinical care of common health problems in *Clinical pathology* and the welfare of society.	2-1-ب-التأثير المتبادل بين الممارسة المهنية وانعكاسها علي البيئة.
2.1. C- Up to date and recent developments in common problems related to *Clinical pathology*.	2-1-ج-التطورات العلمية في مجال التخصص.
2.1. D- Ethical and medicolegal principles relevant to practice in the *Clinical pathology.*	2-1-د-المبادئ الأخلاقية و القانونية للممارسة المهنية في مجال التخصص.
2.1. E-Quality assurance principles related to the good medical practice in *Clinical pathology*	2-1-هـ- مبادئ و أساسيات الجودة في الممارسة المهنية في مجال التخصص
2.1. F- Ethical and scientific basics of medical research.	2-1-و- أساسيات وأخلاقيات البحث العلمي
2.2. A-Correlation of different relevant sciences in the problem solving and management of common diseases of *Clinical pathology* 2.2. B- Problem solving skills based on data analysis and evaluation (even in the absence of some) for common clinical situations related to *Clinical pathology*.	2-2-أ- تحليل و تقييم المعلومات في مجال التخصص والقياس عليها لحل المشاكل

2.2. B- Problem solving skills based on data analysis and evaluation (even in the absence of some) for common clinical situations related to *Clinical pathology*.	2-2-ب- حل المشاكل المتخصصة مع عدم توافر بعض المعطيات
2.2. A-Correlation of different relevant sciences in the problem solving and management of common diseases of *Clinical pathology*.	2-2-ج- الربط بين المعارف المختلفة لحل المشاكل المهنية
2.2. C- Demonstrating systematic approach in studying clinical problems relevant to the *Clinical pathology*.	2-2-د- إجراء دراسة بحثية و /أو كتابة دراسة علمية منهجية حول مشكلة بحثي
2.4.A-Demonstrate practice-based learning and Improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, improvements in patient care and risk management	2-2هـ- تقييم المخاطر في الممارسات المهنية في مجال التخصص
2.4.A-Demonstrate practice-based learning and Improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific improvements in evidence, patient care and risk management	2-2-و- التخطيط لتطوير الأداء في مجال التخصص
2.2.D- Making alternative decisions in different situations in the field of *Clinical pathology*.	2-2-ز- اتخاذ القرارات المهنية في سياقات مهنية متنوعة
2.3.A- provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the	2-3-أ- إتقان المهارات المهنية الأساسية و الحديثة في مجال التخصص

promotion of health. 2.3.B- Demonstrate patient care skills relevant to *Clinical pathology* for patients with common diseases and problems.	
2.3.C- Write and evaluate reports for Situation related to *Clinical pathology*.	2-3-ب- كتابة و تقييم التقارير المهنية
2.3.A- provide patient care that compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. 2.3.B- Demonstrate patient care skills relevant to that speciality for patients with common diseases and problems.	2-3-ج- تقييم الطرق و الأدوات القائمة في مجال التخصص
2.4.D- Demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals.	2-4-أ-التواصل الفعال بأنواعه المختلفة
2.4.A-Demonstrate practice-based learning and improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, improvements in patient care and risk management 2.4.B- Use all information sources and technology to improve his practice.	2-4-ب- استخدام تكنولوجيا المعلومات بما يخدم الممارسة المهنية
2.4.A-Demonstrate practice-based learning and improvement skills that involves investigation and evaluation of	2-4-ج- التقييم الذاتي وتحديد احتياجاته التعلمية الشخصية

their own patient care, appraisal and assimilation of scientific evidence, improvements in patient care and risk management 2.4.B- Use all information sources and technology to improve his practice. 2.4.E-Demonstrate professionalism behavior, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.	
2.4.A-Demonstrate practice-based learning and improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, , improvements in patient care and risk management.	2-4-د- استخدام المصادر المختلفة للحصول على المعلومات و المعارف
2.4. C- Demonstrate skills of teaching and evaluating others.	2-4-هـ- وضع قواعد ومؤشرات تقييم أداء الآخرين
2.4. F- Demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively use system resources to provide care that is of optimal value.	2-4-و- العمل في فريق ، وقيادة فرق في سياقات مهنية مختلفة
2.4.G- Demonstrate skills of effective time management.	2-4-ز- إدارة الوقت بكفاءة
2.4.H- Demonstrate skills of self and continuous learning.	2-4-ح- التعلم الذاتي و المستمر

Comparison between ARS and ILOS for master degree in Clinical pathology.

(ARS)	(ILOs)
2-1- Knowledge and understanding **2-1-A-** Established basic, biomedical, clinical, epidemiological and behavioral sciences related conditions, problem and topics.	***2-1- Knowledge and understanding*** **2-1-A-** Explain the essential facts and principles of relevant basic sciences including, basic microbiology and clinical parasitology related to clinical pathology. **2-1-B-** Mention essential facts of clinically supportive sciences including basic microbiology and clinical parasitology related to clinical pathology. **2-1-C-** Demonstrate sufficient knowledge of etiology, clinical picture, diagnosis, prevention and treatment of the common diseases and situations related to *Clinical pathology*
2-1-B The relation between good clinical care of common health problem in *Clinical pathology* and the welfare of society.	**2-1-H-** State the impact of common health problems in *Clinical pathology* on the society and how good clinical practice improve these problems.
2-1-C- Up to date and recent developments in common Problems related to *Clinical pathology*.	**2-1-C-** Demonstrate sufficient knowledge of etiology, clinical picture, diagnosis, prevention and treatment of the common diseases and situations related to *Clinical pathology* **2-1-D-** Give the recent and update developments in the pathogenesis, diagnosis, prevention and treatment of

	common diseases related to *Clinical pathology***.**
2-1-D- Ethical and medico legal Principles relevant to practice in *Clinical pathology*	**2-1-E-** Mention the basic ethical and medicolegal principles that should be applied in practice and are relevant to *Clinical pathology*
2-1-E-Quality assurance principles related to the good medical practice in *Clinical pathology*	**2-1-F-** Mention the basics and standards of quality assurance to ensure good clinical practice in *Clinical pathology*
2-1-F- Ethical and scientific basics of medical research.	**2-1-G-** Mention the ethical and scientific principles of medical research methodology**.**
***2-2- Intellectual skills*:** **2-2-A**-Correlation of different relevant sciences in the problem solving and management of common diseases of the *Clinical pathology*.	***2-2- Intellectual skills:*** **2-2-A-** Correlate the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common diseases of the *Clinical pathology*.
2-2-B-Problem solving skills based on data analysis and evaluation (even in the absence of some) for common clinical situations related to *Clinical pathology*.	**2-2-B-** Demonstrate an investigatory and analytic thinking approach (problem solving) to common clinical situations related to *Clinical pathology*.
2-2-C- Demonstrating systematic approach in studying clinical problems relevant to the *Clinical pathology* field.	**2-2-C-** Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the *Clinical pathology* field.
2-2-D Making alternative decisions in different situations in the field of the *Clinical pathology*.	**2-2-D-** Formulate management plans and alternative decisions in different situations in the field of the *Clinical pathology*.

continuous (ARS)	**Continuous** (ILOs)
2-3- Clinical skills:	***2/3/1/Practical skills (Patient Care :)***
2-3-A- Provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.	**2-3-1-A-** Obtain proper history and examine patients in caring and respectful behaviors.
2-3-B- Demonstrate patient care skills relevant to that *Clinical pathology* for patients with common diseases and problems.	**2-3-1-B-** Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment for common conditions related to *Clinical pathology*.
	2-3-1-C- Carry out patient management plans for common conditions related to *Clinical pathology*.
	2-3-1-D- Use information technology to support patient care decisions and patient education in common clinical situations related to *Clinical pathology*.
	2-3-1-E- Perform competently non invasive and invasive procedures considered essential for the *Clinical pathology*.
	2-3-1-F- Provide health care services aimed at preventing health problems related to *Clinical pathology*.
	2-3-1-G- Provide patient-focused care in common conditions related to *Clinical pathology*, while working with health care professionals, including those from other disciplines.
2-3-C- Write and evaluate reports for situations related to the field of *Clinical pathology*.	**-3-1-H** Write competently all forms of professional reports related to the Clinical pathology (lab reports, experiments reports,).

2-4- General skills **2-4-A-** Demonstrate practice-based learning and improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, improvements in patient care and risk management	***2/3/2 General skills*** **2-3-2-A-** Perform practice-based improvement activities using a systematic methodology (share in audits and risk management activities and use logbooks). **2-3-2-B-** Appraises evidence from scientific studies. **2-3-2-C-** Conduct epidemiological studies and surveys.
2-4-B- Use all information sources and technology to improve his practice.	**2-3-2-C-** Conduct epidemiological studies and surveys. **2-3-2-D**.Perform data management including data entry and analysis and using information technology to manage information, access on-line medical information; and support their own education.
2-4-C- Demonstrate skills of teaching and evaluating others.	**2-3-2-E-** Facilitate learning of students other health care professionals including their evaluation and assessment.
2-4-D- Demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals.	**2-3-2-F-** Maintain therapeutic and ethically sound relationship with patients. **2-3-2-G-** Elicit information using effective nonverbal, explanatory, questioning, and writing skills. **2-3-2-H-** Provide information using effective nonverbal, explanatory, questioning, and writing skills. **2-3-2-I-** Work effectively with others as a member of a health care team or other professional group.

2-4-E-Demonstrate professionalism behaviors, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.	**2-3-2-J-** Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society. **2-3-2-K-** Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices. **2-3-2-L**-Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities.
2-4-F- Demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively use system resources to provide care that is of optimal value.	**2-3-2-M**-Work effectively in relevant health care delivery settings and systems including good administrative and time management **2-3-2-N-** Practice cost-effective health care and resource allocation that does not compromise quality of care. **2-3-2-O**- Assist patients in dealing with system complexities.
2-4-G- Demonstrate skills of effective time management	**2-3-2-M**-Work effectively in relevant health care delivery settings and systems including good administrative and time management
2-4-H- Demonstrate skills of self and continuous learning.	**2-3-2-A-** Perform practice-based improvement activities using a systematic methodology (share in audits and risk management activities and use logbooks).

III-Program matrix
Knowledge and Understanding

Course	Program covered ILOs							
	2/1/A	2/1/B	2/1/C	2/1/D	2/1/E	2/1/F	2/1/ G	2/1/ H
Course 1 : Clinical Parasitology.	✓	√						
Course 2 : Principles of General and Clinical Microbiology	✓	✓	✓	✓	✓	✓	✓	✓
Course3:Principles of General and Clinical immunology	✓	✓	✓	✓	✓	✓	✓	✓
Course 4 Internal medicine	✓	✓						
Course 5 Clinical pathology	✓	✓	✓	✓	✓	✓	✓	✓

Intellectual

Course	Program covered ILOs			
	2/2/A	2/2/B	2/2/C	2/2/D
Course 1 : Clinical Parasitology.	✓			
Course 2 : Principles of General and Clinical Microbiology	✓	✓	✓	✓
Course3:Principles of General and Clinical immunology	✓	✓	✓	✓
Course 4 Internal medicine	✓			
Course 5 Clinical pathology	✓	✓	✓	✓

Practical Skills (Patient Care)

Course	Program covered ILOs							
	2/3/1/A	2/3/1/B	2/3/1/C	2/3/1/D	2/3/1/E	2/3/1/F	2/3/1/G	2/3/1/H
Course 1 : Clinical Parasitology.		√		√				
Course 2 : Principles of General and Clinical Microbiology	✓	✓	✓	✓	✓	✓	✓	✓
Course3:Principles of General and Clinical immunology	✓	✓	✓	✓	✓	✓	✓	✓
Course 4 Internal medicine	✓	√		√				
Course 5 Clinical pathology	✓	✓	✓	✓	✓	✓	✓	✓

General Skills

Course	Program covered ILOs							
	2/3/2/A	2/3/2/B	2/3/2/C	2/3/2/D	2/3/2/E	2/3/2/F	2/3/2/G	2/3/2/H
Course 1 : Clinical Parasitology.	√			✓			√	✓
Course 2 : Principles of General and Clinical Microbiology	✓	✓	✓	✓	✓	✓	✓	✓
Course3:Principles of General and Clinical immunology	✓	✓	✓	✓	✓	✓	✓	✓
Course 4 Internal medicine	√			✓		√	√	✓
Course 5 Clinical pathology	✓	✓	✓	✓	✓	✓	✓	✓

General Skills (cont.)

Course	Program covered ILOs						
	2/3/2/I	2/3/2/J	2/3/2/K	2/3/2/L	2/3/2/M	2/3/2/N	2/3/2/O
Course 1 : Clinical Parasitology.							
Course 2 : Principles of General and Clinical Microbiology	✓	✓	✓	✓	✓	✓	✓
Course3:Principles of General and Clinical immunology	✓	✓	✓	✓	✓	✓	✓
Course 4 Internal medicine		√	√		√		
Course 5 Clinical pathology	✓	✓	✓	✓	✓	✓	✓

Annex 7, Additional information:

- **Example:**
- **Department information:**
- **Staff members:**
- **Opportunities within the department:**
- **Department quality control insurance for completing the program:**

(End of the program specifications)