

كلية الطب وحدة ضمان الجودة



MEDICAL DOCTORATE (M.D.) DEGREE PROGRAM AND COURSES SPECIFICATIONS FOR CLINICAL PATHOLOGY

(According to currently applied Credit point by laws)

Clinical Pathology
Department
Faculty of medicine
Assiut University
2022-2023

Contents			
Item	Page		
Program Specification For Clinical Pathology years, 2022-2023			
A. Basic Information	3		
B. Professional Information	4		
1. Program aims			
2. Intended learning outcomes (ILOs) for the whole			
program 2. Program academic standards			
3. Program academic standards			
4. Program external references 5. Drogram externations and contents			
5. Program structure and contents			
6. Courses contents (Annex 1)			
7. Admission requirements			
8. Progression and completion requirements			
9. Assessment methods and rules			
10. Program evaluation			
11. Declaration			
- Annex 1, Courses/ specifications	20		
Essential Courses	21		
Course 1: Medical statistics.	21		
Course 2: Research methodology	28		
Course 3: Medicolegal Aspects & Ethics in Medical Practice	36		
and Scientific Research	30		
Course 4:- Cytogentics	41		
Course 5: Molecular Biology	48		
Course 6: Instrumentation and Equipments	59		
Specialized Courses			
Course 7: Clinical pathology(Advanced)	65		
Unit 1: Haematology			
Unit 2: Clinical chemistry			
Unit 3: Immunology			
Unit 4: Microbiology			

- Annex 2, Program academic standards	142
- Annex 3, Teaching methods	147
- Annex 4, Assessment methods	150
- Annex 5, Program evaluation tools	154
- Annex 6 Program matrixes:	
I-General Academic reference standards(GARS) for	
postgraduates versus Program ARS	
II-Program ARS versus program ILOs	
III- Program ILOs versus courses ILOs	
- Annex 7, Additional information.	175

M. D. degree of Clinical Pathology

A. Basic Information

- **♣** Program Title: MD degree of Clinical Pathology
- Nature of the program: Single.
- Responsible Department: Department of Clinical Pathology- faculty of medicine-Assiut University
- Program Academic Director (Head of the Department):

Prof.Dr/ Azza Mahmoud Ezz- Eldin

Coordinator (s):

Principle coordinator: Prof. Dr. Aml Abdelaal

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. Osama Bakr Sedieq Othman

Prof. Monazzama Abdel-Aal Fadel

Prof. Nabila Mohamed Thabet

Prof. Sohair Mohamed Ahmed Farghaly

Prof.. Nadia Mahmoud Abdel-Wahab

Prof. Wafaa Mohammed Tohamy El.Sherif

Prof. Hanan Hareth Abdullahtif El-Sayed

Prof. Heba Allah Mohamed Rashed

• External evaluator:

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: 9 courses

- First part: 6 courses

- Second part: 1 course

- Elective course: 2

B. Professional Information

1- Program aims

- I/1. To enable candidates to maintain international standards of patient care by mastering a high level of clinical laboratory skills, as well as to update medical knowledge, clinical experience, and competence in the area of clinical pathology, and to enable candidates to diagnose diseases.
- 1/2. Provide assistant lecturers with fundamental knowledge of the interpretation of diagnostic tests. Information about tests and diseases has been extensively updated, including newer technologies that have markedly improved our accuracy and diagnostic ability.1/3 To enable candidates to perform high standard scientific medical research and how to proceed with publication in indexed medical journals.
- **1/4**. **To enable** them to have professional careers as consultants in Egypt.
 - Make them recognized as a consultant abroad.
 - Enable them to continue self-learning in subspecialties.
 - Enable them to master different research methodologies and do their own.

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

2/1Knowledge and understanding:

- A. Demonstrate in-depth knowledge and understanding of relevant theories, fundamentals, and up-to-date biomedical, clinical, epidemiological, and socio-behavioral science, as well as evidence-based application of this knowledge to patient care.
- B. Explain the basics, methodology, tools and ethics of scientific medical, clinical research related to clinical pathology.

- C. Mention ethical, medico logical principles and bylaws relevant to his practice in clinical pathology including clinical chemistry, hematology, microbiology and immunology.
- D. Mention the principles and fundamentals of quality assurance and quality improvement in clinical pathology medical education, including clinical chemistry, hematology, microbiology, and immunology, as well as clinical pathology clinical practice, including clinical chemistry, hematology, microbiology, and immunology.
- **E.** Mention the health-care system, public health, health policy, issues relevant to this specialty, and principles and methods of system-based improvement of patient care in common clinical pathology problems, such as clinical chemistry, hematology, microbiology, and immunology.

2/2 Intellectual outcomes

- A. Apply the basic and clinically supportive sciences which are appropriate to the speciality related conditions, problems, and topics, including clinical chemistry, hematology, microbiology, and immunology.
- B. Demonstrate an investigatory and analytic thinking "problem-solving" approach to clinical situations related to clinical pathology, including clinical chemistry, hematology, microbiology, and immunology.
- C. Plan research projects related to clinical pathology, including clinical chemistry, hematology, microbiology, and immunology.
- D. Write scientific papers.
- E. Participate in clinical risk management as a part of clinical governance.
 - Plan for quality improvement in the field of medical education and clinical practice in clinical pathology, including clinical chemistry, hematology, clinical bacteriology, and clinical immunology.
 - F.Create / innovate plans, systems, and other issues for improvement of performance in his practice.

G. Present and defend his / her data in front of a panel of experts
H. Formulate management plans and alternative decisions in different situations in the field of clinical pathology

2/3 Skills

2/3/1 Practical skills (Patient Care)

Students will be able to:

- A. Provide extensive levels of practical laboratory skills and patient care that are compassionate, appropriate, and effective for the diagnosis of health problems and the promotion of health
 - *p.s.* "Extensive level" means in-depth understanding from basic science to evidence-based clinical application, as well as the ability to manage all clinical pathology problems independently, including clinical chemistry, hematology, microbiology, and immunology.
 - B. Provide extensive levels of patient care **for patients with all common diagnoses and for uncomplicated procedures** related to clinical pathology, including clinical chemistry, hematology, microbiology, and immunology.
 - C. Provide extensive levels of patient care **for non-routine**, **complicated patients and under increasingly difficult circumstances**, while demonstrating compassion, appropriate, and effective care.
 - D. Perform essential diagnostic procedures in clinical pathology, such as clinical chemistry, hematology, microbiology, and immunology.
 - E. Handles unexpected complications, while demonstrating compassion and sensitivity to patient needs and concerns.
 - F. Communicate effectively and demonstrate caring and respectful behaviours when interacting with patients and their

families in clinical pathology, including clinical chemistry, hematology, microbiology, and immunology related situations.

- G. Gather essential and accurate information about practical/laboratory skills in clinical pathology, including: clinical pathology, including clinical chemistry, hematology, microbiology, and immunology.
- H. Make informed decisions about diagnostic and laboratory tests and preferences based on up-to-date scientific evidence and clinical judgement for clinical pathology, including clinical chemistry, hematology, microbiology, and immunology related conditions.
- I. Create and implement diagnostic and educational plans for clinical pathology, including clinical chemistry, hematology, microbiology, and immunology-related conditions.
- J. Counsel and educate patients and their families about clinical pathology-related laboratory skills, including: clinical chemistry, hematology, microbiology, and immunology-related conditions.
- K. Use information technology to support practical decisions and students' education in all clinical pathology, including clinical chemistry, hematology, microbiology, and immunology related clinical situations.
- L. Perform all laboratory skills deemed necessary for clinical pathology-related conditions and areas of practice, including chemistry, hematology, microbiology, and immunology-related conditions and areas of practice.
- M. Provide health care services aimed at preventing the clinical pathology including clinical chemistry, hematology, microbiology and immunology related health problems.

- N. Lead health care professionals, including those from other disciplines, to provide practical/laboratory-focused care in clinical pathology, including clinical chemistry, hematology, microbiology, and immunology related conditions.
- **O.** Write competently on 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. Demonstrate the competency of continuous evaluation of different types of skills provision in laboratory work in the different areas of clinical pathology, including clinical chemistry, hematology, microbiology, and immunology Appraise scientific evidence.
- B. Continuously improve laboratory skills based on constant self-evaluation and life-long learning.
- C. Participate in clinical audits and research projects.
- D. Practice skills in evidence-based medicine (EBM).
- E. Educate and evaluate students, residents and other health professionals.
- F. Design logbooks.
- G. Design clinical guidelines and standard protocols for management.
- H. Appraise evidence from scientific studies related to the patients' health problems.
- I. Apply knowledge of study designs and statistical methods to the appraisal of experimental/clinical studies and other

information on diagnostic and/or therapeutic effectiveness including: clinical chemistry, hematology, microbiology and immunology

J. Use information technology to manage information, access on-line medical information; for important topics.

Interpersonal and Communication Skills

- L. Master interpersonal and communication skills that result in the effective exchange of information and collaboration_with patients, their families, and health professionals, including:-
 - Present a case.
 - Write a consultation note.
 - Inform patients of a diagnosis and maintaining comprehensive.
 - Timely and legible medical records.
 - Teamwork skills.
- M. Create and sustain a therapeutic and ethically sound relationship with others.
- N. Elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills.
- O. Work effectively with others as a member or leader of a health care laboratory team or other professional group.

Professionalism

- P. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of the institution and society
- Q. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.
- R. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities.

Systems-Based Practice

- S. Work effectively in health care delivery settings and systems related to clinical pathology including clinical chemistry, hematology, microbiology and immunology
- T. Practice cost-effective health care and resource allocation that does not compromise quality of care.
- U. Advocate for quality patient care and assist patients in dealing with system complexities.
- V. Design, monitor and evaluate specification of under and post graduate course and programs.
- W. Act as a chair man for scientific meetings including time management.

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

Academic standards for Doctorate (MD) degree in clinical Pathology.

Assiut Faculty of Medicine developed MD degree programs' academic standards for different clinical Pathology. In preparing these standards, the General Academic Reference Standards for postgraduate programs (NARS) 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 20/3/2010. 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).

http://www.acgme.org/acWebsite/navPages/nav_Public.asp

2. American Association for Clinical Chemistry www.redorbit.com.

5- Program Structure

A. Duration of program: 4-6 years

B. Structure of the program:

Total number of credit points: = 420 CP

Master degree: 180 credit point

Didactic #: 37 (23.1%), practical 123 (76.9%), total 160 CP

Thesis and researches: 80 CP (33.3%)

First part

Didactic 9.4 (94%), practical 0.6 (6 %), total 10 CP

Second part

Didactic 24, (16.3 %), practical 123 (83.7 %), total 147 CP

Elective courses: 3 credit points

#Didactic (lectures, seminars, tutorial)

According the currently applied bylaws:

Total courses: 160 credit point

Compulsory courses: 157 credit point (98.1%)

Elective courses: 3 credit point (1.9%)

	Credit point	% from total	
Basic courses	10	4.1%	
Humanity and social courses	3	1.2%	
Specialized courses	147	61.3%	
Others (Computer,)	-	0	
Field training	123	51.3%	
Thesis	40	16.7%	
2 published researches	40	16.7%	
Master degree	180		

C- Program Time Table

Duration of program 4 years divided into

o Part 1

Program-related essential courses

Program-related essential courses

- Medical statistic
- Research methodology
- Medicolegal Aspects and Ethics in Medical Practice and Scientific Research

Students are allowed to sit the exams of these courses after 6 months from applying to the M D degree.

Students are allowed to sit the exams of the remaining essential courses after 12 months from applying to the MD degree.

Thesis and 2 published researches

For the M D thesis:

MD thesis subject should be officially registered within 1 year from application to the MD degree,

Discussion and acceptance of the thesis should not be set before 24 months from registering the M D subject; It could be discussed and accepted either before or after passing the second part of examination

o Part 2

Program —related specialized science courses and ILOs Students are not allowed to sit the exams of these courses before 4 years from applying to the MD degree.

Two elective courses can be set during either the 1st or 2nd parts.

The students pass if they get 50% from the written exams and 60% from oral exams, 60% from clinical exams of each course and 60% of summation of the written exams, oral and clinical exams of each course

Total degrees 1700 marks.
500 marks for first part
1200 for second part
Written exam 40% - 70%.
Clinical and oral exams 30% - 60%.

Curriculum Structure: (Courses):

↓Levels and courses of the program:

Modules/ Units	Course	CP		
delivering courses and	Code	Lecture	training	total
student work load list		S	S	
First Part				
Essential Courses				
Course1: Medical	FAC309A	1	-	1CP
statistics. Course 2:				
Research methodology	FAC309B	1	-	1CP
Course 3: Medicolegal				
Aspets and Ethics in	FAC310C	1	-	1CP
Medical Practice and				
Scientific Research				. ~-
Course 4: Cytogentics	CCP331A	2	-	2CP
Course 5: Molecular	CCP331B	1.5	0.5	2CP
Biology	CCD221C			agp
Course 6:	CCP331C	3	-	3CP
Instrumentation and				
Equipments Second Port		Cassislia	. 1	
Second Part	Specialized (-	ed courses	
Specialized course	Specialized C		ork (log Book)	
Clinical	CCP331D	24CP	123CP	
pathology(advanced)	CCISSID		date will choose	
1) Unit 1 Clinical			module) as a	
		`	ule and other 3	
Chemistry			s subsidiary	
		modules.		
2) Unit 2		- Main module=70%		
		16.8 CP for didactics		
Heamatology		.practical 87CP		
		- Subsidiary modules=		
3) Unit 3		30%;7.2CP for didactics		
		and		
Immunology		36 CP for practical		

4)-unit 4 Clinical			
Microbiology			
Third Part			
Thesis and at least one			
published research			
Elective courses*		3 CP	
o Elective course 1		1.5CP	
o Elective course 2		1.5CP	
Thesis	40 CP		
Published	40 CP		
researches**			

#Didactic (lectures, seminars, tutorial)

* 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#:

- Advanced medical statistics.
- o Evidence based medicine.
- Advanced infection control.
- o Quality assurance of medical education.
- o Quality assurance of clinical practice.
- -Hospital management

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

3. Thesis / Researches:

40 CP are appointed to the completion and acceptance of the thesis.

**Another 40 points are appointed to acceptance or publication of one research from the thesis in international indexed medical journals or publication of 2 researches from the thesis in local specialized medical journals.

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 Annex 6 II: Program Matrix

7-Admission requirements

- Admission Requirements (prerequisites) if any :
 - I. General Requirements:
 - Master degree in the Clinical Pathology.

II. Specific Requirements:

- Candidates graduated from Egyptian Universities .
- Candidate should be fluent in English (Study Language)

VACATIONS AND STUDY LEAVE

The current departmental policy is to give working assistant lecture 3 week leave prior to first/ second part exams.

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 (Medical statistic, Research methodology and Medicolegal Aspects and Ethics in Medical Practice and Scientific Research) could be set at 6 months from registering to the MD degree.
- ♣ Students are allowed to sit the exams of the remaining essential courses of the first part after 12 months from applying to the MD degree.
- **Examination** of the second part cannot be set before 4 years from registering to the degree.
- → Discussion of the MD thesis could be set after 2 years from officially registering the MD subject, either before or after setting the second part exams.
- **♣** The minimum duration of the program is 4 years.

The students are offered the degree when:

- 1. Passing the exams of all essential, elective and specialized 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 MD thesis.
- 4. Acceptance or publication of one research from the thesis in international indexed medical journals or publication of 2 researches from the thesis in local specialized medical journals.

9-Program assessment methods and rules (Annex IV)

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

Weighting of assessments:

Courses		Degrees			
Courses	Course	Written	Oral	Practical	Total
	Code	Exam	*	/ Clinical	
				Exam	
		First Part			T
Essential					
Courses:					
Medical	FAC309A	35	15	-	50
Statistics					
Research	FAC309B	35	15	-	50
Methodology					
Medicolegal	FAC310C	35	15	-	50
Aspects &					
Ethics in					
Medical					
Practice and					
Scientific					
Research					
Course 4	CCP331A	50	50	-	100
Cytogentics	CCP331B		20	20	100
Course 5 Molecular Biology		50	20	30	100
Course 6	CCP331C	100	50	-	150
Instrumentation and Equipments					
Total of the					500
first part					
•	;	Second Part	l	l	l
	Course	written	oral	clinical	total
	code				
Specialized					
Courses					
Course7:	CCP331D	600(3 paper	240	360	1200
clinical		for advanced			
pathology(subspeciality			
advanced)		140 marks for			

	each+ paper 4 for remaining 3 units=180 marks)			
Total of the second part	600	240	360	1200
Elective course 1	50	50		100
Elective course 2	50	50		100

^{* 25%} of the oral exam for assessment of logbook

Total degree 1900

500 marks for first part

1200 for second part

Lesson Examination system:

> First part:

- Written exam 2 hours in Medical Statistics and Research Methodology + oral examination
- Written exam 1 hours in Medico legal Aspects and Ethics in Medical Practice and Scientific Research + oral examination
- Written exam 2 hours in Cytogenetics + oral examination
- Written exam 2 hours in Molecular Biology + oral examination + practical examination
- Written exam 2 hours in Instrumentation and Equipments + oral examination
- 600(3 paper for advanced subspeciality 140 marks for each+ paper 4 for remaining 3 units=180 marks)

> Second part:

 Written exam 3 paper for advanced subspeciality(Clinical Chemistry or Hematology or Clinical immunology or Clinical Immunology + one paper for remaining subsidiary courses + Oral examination + Practical examination

Elective courses

- Written exam one paper 1 hour in Elective course 1 + Oral & Practical exam
- Written exam one paper 1 hour in Elective course 2 + Oral & Practical exam

10-Program evaluation

By whom	method	sample
Quality Assurance	Reports	#
Unit	Field visits	
External Evaluator	Reports	#
(s):According to	Field visits	
department council		
External Examiner		
(s): According to		
department council		
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	Prof. Dr. Aml		
Coordinator:	Abdelaal		
Head of the Responsible	Prof Dr Azza		
Department (Program	Mahmoud Ezz EL		
Academic Director)	din		

Annex 1 Specifications for Courses / Modules

Course 1: Medical statistics

Name of department: Public Health and Community Medicine
Faculty of medicine
Assiut University
2022-2023

1. Course data

- **Lesson** Course Title: Medical statistics
- **4** Course code: FAC309A
- **\$\infty\$** Specialty: offered to all clinical and academic specialties
- **♣** Number of credit points: 1 credit point
- **Department** (s) delivering the course: Pubic Health and Community Medicine
- **4** Coordinator (s):
 - Course coordinator: Prof. Farag Mohammed Moftah
 - Assistant coordinator (s):

Prof. Medhat Araby Khalil Saleh

- ♣ Date last reviewed: January -2022
- **Requirements** (pre-requisites) if any:
 - Completed Master degree in any of the academic or clinical departments of Medicine.

2. Course Aims

Enable gradute students to use statistical principles to improve their professional work and develop the concept of critical interpretation of data

3. Intended learning outcomes (ILOs):To be able to use statistical principals to manage data

A knowledge and understanding

ILOS	Methods of	Methods of
	teaching/	Evaluation
	learning	
A. List the types of variables	Lecture and	Written
J 1	discussion	examination
B. Identify the methods of data collection	Lecture and	Written
	discussion	examination
C. Describe the different sampling	Lecture and	Written
strategies	discussion	examination
D. Identify types of tabular and graphic	Lecture and	Written
presentation of data	discussion	examination
E. Identify measures of central tendency	Lecture and	Written
and dispersion	discussion	examination
F. Identify the characters of normal	Lecture and	Written
distribution curve.	discussion	examination
G. Detect the difference between	Lecture and	Written
parametric and non-parametric tests	discussion	examination
H. Identify the concepts of correlation and	Lecture and	Written
regression	discussion	examination

B. intellectual

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Describe the normal curves.	Lecture& Discussions	Written examination
B. Describe and summarize data	Lecture& Discussions	Written examination
C. Select the proper test of significance	Lecture& Discussions	Written examination
D. Interpret the proper test of significance	Lecture& Discussions	Written examination
E. Describe the difference between parametric and non-parametric tests	Lecture& Discussions	Written examination

C. Practical skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Design data entry files.	Tutorial on SPSS	Assignments SPSS exam
B. Validate data entry.	Tutorial on SPSS	Assignments SPSS exam
C. Manage data files.	Tutorial on SPSS	Assignments SPSS exam
D. Construct tables and graphs.	Tutorial on SPSS	Assignments SPSS exam
E. Calculate measures of central tendency and dispersion.	Tutorial on SPSS	Assignments SPSS exam
F. Select, apply and interpret the proper test of significance.	Tutorial on SPSS	Assignments SPSS exam

D general skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Appraise scientific evidence	Discussions	Research assignment
B. Use information technology to manage information, access on-line medical information; for the important topics.	tutorial	Research and audits' assignment

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

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual _	Practical skills	General Skills
	A	В	C	D
Introduction	A-F	A-D	-	A&B
Tables and graphics	D	A-D	-	A&B
Sampling	С	-	-	A&B
Methodology of data collection	В	-	-	A&B
Type of variables	A	-	-	A&B
Proportion test& Chi-square test	E,F	C&D	-	A&B
Student T test& Paired T test	E,F	C&D	F	A&B
ANOVA test	E,F	C&D	F	A&B
Non parametric tests	E,F	C&D	F	A&B
Discrimination analysis factor analysis	E,F	C&D	-	A&B
SPSS Introduction	A-F	A-D	-	A&B
Data entry and cleaning of data	A	A-D	A-C	A&B
Transforming of variables	A	A&B	A-C	A&B
Descriptive statistics	D	A-D	D&E	A&B
Graphic presentation	D	A&B	D	A&B
Chi square and interpretation of results	E,F	C&D	F	A&B
Correlation Regression	E,F	C&D	F	A&B
Multiple and logistic Regression	E,F	C&D	F	A&B

5. Course Methods of teaching/learning

- 1. Lectures
- 2. Assignments
- 3. Discussions
- 4. Exercises
- 5. Tutorial on SPSS v.16

6. Course assessment methods:

i. Assessment tools:

- 1. Attendance and active participation
- 2. Assignment
- **3.** Practical SPSS examination
- 4. Written exam
- **ii. Time schedule:** After 6 months from applying to the M D degree.
- iii. Marks: 50 (35 for written exam and 15 for practical exam).

7. List of references

i. Lectures notes

Department lecture notes

ii. Essential books

- Medical Statistics: Book by Ramakrishna HK 2016
 - Janet Peacock and Philip Peacock. Oxford Handbook of Medical Statistics (second edition.) Publisher: Oxford University Press, Print Publication Date: Nov 2010 Print ISBN-13: 9780199551286, Published online: Jun 2011. DOI: 10.1093/med/9780199551286.001.0001
 - Leslie E. Daly MSc, PhD, Hon MFPHM,, Geoffrey J. Bourke MA, MD, FRCPI, FFPHM, FFPHMI, Interpretation and Uses of Medical Statistics, Fifth Edition, First published:1 January 2000, Print ISBN:9780632047635 |Online ISBN:9780470696750 |DOI:10.1002/9780470696750
 - Marcello Pagano, Kimberlee Gauvreau: Principles of Biostatistics second edition published in 2000 by Brooks/Cole and then Cengage Learning. CRC Press, Feb 19, 2018 Mathematics 584 pages.

Iii- Recommended books

- Ji-Qian Fang (Sun Yat-Sen University, China) Handbook of Medical Statistics: https://doi.org/10.1142/10259 | September 2017.Pages: 852
- Robert H. Riffenburgh: Statistics in Medicine 4th Edition (2020). EvidenceEvidence Based Medicine How to practice and teach EBM.
- Discovering Statistics Using IBM SPSS Book by Andy Field, 2013.

iii. Periodicals, Web sites, etc

- iv. **Periodicals**, **etc** Statistics in Medicine Wiley Online Library
- v. **Web sites** https://www.phc.ox.ac.uk/research/medicalstatistics

8. Signatures

Course Coordinator:	Head of the Department:
 Farag Mohammed Moftah 	- Prof. Eman Morsy
	Mohamed
Date : 10-1-2022	Date : 10-1-2022
Associated Coordinator:	
Prof. Medhat Araby Khalil Saleh	
Date : 10-1-2022	

Course 2: Research Methodology

Name of department: Public Health and Community Medicine Faculty of medicine Assiut University 2021-2022

1. Course data

- **Let Course Title: Research methodology**
- Course code: FAC309B
- **♣** Specialty: Offered to all clinical and academic specialties
- **♣** Number of credit points: 1 credit point
- **Department** (s) delivering the course: Department of public health
- **Coordinator** (s):
 - **Course coordinator:** Prof. Mahmoud Attia

Assistant coordinator (s): Prof. Ekram Mohamed

- Prof. Medhat Araby Khalil

- **Date last reviewed:** January 2022
- **Requirements** (prerequisites) if any:
 - Completed Master degree in any of the academic or clinical departments of Medicine.

2. Course Aims

To provide graduate students with the skills of:

- planning and implementing sound research
- writing a scientific research proposal

3. Intended learning outcomes (ILOs)

A knowledge and understanding

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Explain differences between different	Lecture and	Written exam
study designs.	discussion	Log book
	Practical sessions	assignments
	Workshops	Practical exam
B. Identify sources and types of bias in	Lecture and	Written exam
research.	discussion	Log book
	Practical sessions	assignments
		Practical exam
C. Identify methods of data collection.	Lecture and	Written exam
	discussion	Log book
	Practical sessions	assignments
D. Select and design valid measurement	Lecture and	Written exam
tools for research.	discussion	Log book
	Practical sessions	assignments
	Workshops	Practical exam
E. Explain ethical issues in conducting	Lecture and	Written exam
research on human subjects.	discussion	Log book
	Practical sessions	assignments
	Workshops	
F. List the steps involved in proposal	Lecture and	Written exam
writing.	discussion	Log book
	Practical sessions	assignments
	Workshops	Practical exam
G. Identify a research problem within a	Lecture	Written exam
conceptual framework.	Discussion	Log book
Conceptual framework.		assignments
		Practical exam

H. Use the web sources to do a literature search	Practical tutorial on web	Log book assignment
I. Describe the rules of authorship in scientific writing.	Lecture and discussion Practical sessions Workshops	Written exam Log book assignments
J. Select the appropriate study design for the research question.	Lecture Practical sessions	Written exam Practical exam
K. Minimize bias in designing research.	Lecture	Written exam
L. Screening & theoretical background	Lectures	Written exam Practical exam
M. Mention the basic ethics for conducting a research and medicolegal principles relevant to data confidentiality.	lectures seminar	Written exam Practical exam

B. intellectual

Competency and Skills	Methods of	Methods of
	teaching/	Evaluation
	learning	
A-Apply basic science & knowledge for	Discussions	Written exam
appraising scientific literature.	&seminars	Practical exam
B- Design research and present study data,	lecture	log book
in seminars.	seminar	assignments
C- Design suitable epidemiological study.	lecture	log book
	seminar	assignments
D-Design strategies for resolving ethical	lecture	Written exam
concerns in research, law, and regulations.	Workshops	log book
		assignments
E- Apply coherently synthesize ideas and	lecture	log book
integrate lateral and vertical thinking.	Workshops	assignments
F- Evaluate screening tests and interpreting	lecture	Written exam
their uses in different population.		Practical exam

C.Practical skills

Competency and	Methods of	Methods of
Skills	teaching/	Evaluation
	learning	
A- Conduct epidemiological studies, screening	lectures	written exam
and surveys.	seminar	log book
		assignments
B- Identify steps required in fielding the study.	Lecture	Assignments
		Written exam
C- Managing data collection team.	lectures	log book
	seminar	assignments
D- Identify steps required for calculation	Lecture	Assignments
sensitivity, specificity, positive predictive	Practical	Written exam
value, negative predictive value, accuracy of	sessions	Practical exam
a screening test.		
E- Be able to define and apply the	Lecture	Assignments
epidemiologic criteria of causality and be	Practical	Written exam
able to distinguish between a measure of	sessions	Practical exam
association and evidence of causality.		
F- Synthesize information from multiple	Lecture	Assignments
sources for research writing and the ability	Practical	Written exam
to perform paper critique.	sessions	Practical exam
G- Identify bias and confounding in	Lecture	Assignments
epidemiological study designs, their types	Practical	Written exam
and ways to control them in various types of	sessions	Practical exam
biases.		

D General skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A- Scientific paper and proposal writing skills: be able to write an introduction, objectives and the methodological section.	Tutorial	Written examination
B- Learn authorship ethical rules.	Tutorial	Written examination
C- Perform practice-based improvement activities using a systematic methodology (audit, logbook, critical appraisal)	- Lectures -Practical sessions - Discussion - Readings	critical appraisal
D- Appraise evidence from scientific studies(journal club)	- Lectures -Practical sessions - Discussion - Readings	critical appraisal
E- Conduct epidemiological studies, screening and surveys.	- Lectures -Practical sessions - Discussion - Readings	attendance and participation
F- Facilitate training of junior students and other health care professionals in different screening activities.	Field work Participation in projects	attendance and participation

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
G- Maintain ethically sound relationship with	- Lectures	Written
community members.	-Practical sessions	exams
	- Discussion	
	- Readings	
H- Provide information using effective nonverbal,	- Lectures	Written
explanatory, questioning, and writing skills.	-Practical sessions	exams
	- Discussion	Practical
	- Readings	exams
I- Present results of researches in seminars.	- Lectures	Log book
	-Practical sessions	assignments
	- Discussion	
	- Readings	

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
J- Demonstrate respect, compassion, and integrity to the needs of society.	LecturesDiscussionReadings	Written exams
K- Manage potential conflicts of interest encountered by practitioners, researchers, and organizations.	LecturesDiscussionReadings	Written exams
L- Design strategies for resolving ethical concerns in research, law, and regulations.	Lectures - Discussion - Readings	Written exams Practical exams
M- Demonstrate ways to control for confounding in the analysis phase of a study	Lectures - Discussion - Readings	Written exams Practical exams
N- Demonstrate a commitment to ethical principles including confidentiality of participants' information and informed consent.	Lectures - Discussion - Readings	Written exams
O- Assess ethical considerations in developing communications and promotional initiatives.	LecturesDiscussionReadings	Written exams

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

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skills	General Skills
	A	В	C	D
Over view on research conduction and research ethics	A&E	A-D	A-C	C-G, I,L&M-O
How to write a research proposal	F,I	Е	F	A-C&H
Observational study design	A& D	B & C	D	E & F
Experimental study design	A& D	B & C	В	E & F
Evaluation of diagnostic tests (Screening)	L	A	B& E	F
Systematic reviews and meta analysis	G, H & M	E& F	F	C, D
Confounding, bias & effect modification	B & K	D	E & G	M

5. Course Methods of teaching/learning:

- 1. Lectures
- 2. Assignments
- 3. Discussion
- 4. Exercises

6. Course assessment methods:

i. Assessment tools:

- 1. Attendance and participation
- 2. Log book assignments
- 3. Written examination
- 4. Practical examination
- **ii. Time schedule:** After 6 months from applying to the M D degree.
- iii. Marks: 50 (35 for written exam and 15 for practical exam).

7. List of references

i. Lectures notes

• Department lecture notes

ii. Essential books

- Research Design: Qualitative, Quantitative and Mixed Methods Approaches 4th Edition by John W. CreswellSAGE Publications, Inc; 4th edition (January 1, 2014)
- Research methodology: A step by step Guide for Beginners. Ranjit Kumar, 2020. Second edition https://books.google.com.eg/books?
- Medical Research Essentials Rania Esteitie, McGraw Hill Professional, third edition, Feb 5, 2014 Medical 104 pages
- Research Methodology in the Medical and Biological Sciences Petter Laake, Haakon Breien Benestad, Bjorn R. Reino Olsen, 4th edition, Academic Press, Nov 5, 2007 - Science - 512 pages

iv. Recommended books

- Research Methods in Education 7th Edition, by Louis Cohen, Lawrence Manion, Keith Morrison Publisher: Routledge; (April 22, 2011) www.routledge.com/textbooks/cohen7e.
- Research Methodology: A Practical and Scientific Approach Vinayak Bairagi, Mousami V. Munot · 2019, Research Methodology: A Practical and Scientific Approach - Google Books
- Based Medicine How to practice and teach EBM. David Sachett, Sharon E. Straus, W. Scott Richardson, William Rosenberg R.Brain Haynes
- Dissertation workshop open courseware JHSPH

8. Signatures

Course Coordinator:	Head of the Department:	
Prof.Mahmoud Attia	Prof. Eman Morsy Mohamed	
Date : 10-1-2022	Date : 10-1-2022	

Course 3: Medicolegal Aspects and Ethics in Medical Practice and Scientific Research

Name of department:

Forensic medicine and clinical toxicology

Faculty of medicine

Assiut University

2022-2023

1. Course data

- **4** Course Title: Medicolegal Aspects and Ethics in Medical Practice and Scientific Research
- **Lesson** Course code: FAC310C
- **♣** Speciality: Clinical pathology (1st part).
- **♣** Number of credit points: 1 credit point
- **♣** Department (s) delivering the course: Forensic Medicine and Clinical Toxicology
- **Coordinator** (s):
 - Course coordinator: Prof. Ghada Omran
 - Assistant coordinator (s) Prof. Zaghloul Thabet
 - **Date last reviewed:** 4-2022
- Requirements (prerequisites) if any :
 - **➤** Completed Master degree

2. Course Aims

2/1To describe the basic ethical and medicolegal principles and bylaws relevant to practice in the field of Clinical Pathology

3. Intended learning outcomes (ILOs):

A knowledge and understanding

Competency and Skills	Methods of teaching/	Methods of Evaluation
	Learning	
A. Mention medical ethics.	Lecture and discussion	Oral &Written exam
B. Explain ethics in research.(human and animal)	Lecture and discussion	Oral &Written exam
C. Mention medical laws.	Lecture and discussion	Oral &Written exam
D. List causes of medical responsibilities.	Lecture and discussion	Oral &Written exam

B. intellectual

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A-Design and present case, seminars in common problem In medical responsibilities, medical ethics and ethics in research-	Lecture and discussion	Oral &Written exam

C. Practical skills

Competency and Skills	Methods of teaching/	Methods of
SKIIIS	learning	Evaluation
A. Write medical and legal	Lecture and discussion	Discussion
reports.		
B. Identify ethics in research.	Lecture and discussion	Discussion
C. Identify medical laws.	Lecture and discussion	Discussion
D. Identify medical	Lecture and discussion	Discussion
responsibilities.		

D general skills

Practice-Based Learning and Improvement

Competency and	Methods of teaching/	Methods of
Skills	learning	Evaluation
A. Inform patients and maintaining comprehensive.		Global rating logbook
B. Make timely and legible medical records		Global rating logbook
C. Acquire the teamwork skills	Lecture and discussion	Global rating logbook

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

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge Intellectual Pract		Practical	General
			skill	Skills
	A	В	C	D
Ethics in research.	В	A	В	A,C
Medical ethics.	A	A	A	A,C
Medical laws	C	A	C	В
Medical responsibilities.	D	A	D	В

5. Course Methods of teaching/learning:

- 1. Lectures.
- 2. Discussions.
- 3. Exercises.

6. Course assessment methods:

i. Assessment tools:

- 1. Written examination.
- 2. Attendance and active participation.
- 3. Oral examination.
- **ii. Time schedule:** After 6 months from applying to the M D degree.
- iii. Marks: 50 (35 for written exam and 15 for oral exam).

7. List of references

i. Lectures notes

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

ii. Essential books

• Bernard Knight and Pekka Saukko (2015: Knight Forensic Pathology. Hodder Arnold press

- Goldfrank, Lewis R.; Howland, Mary Ann; Hoffman, Robert S.; Nelson, Ewis S.; Lewin, Neal A (2019): Goldfrank's Toxicologic Emergencies, 11th ed. McGraw Hill / Medical.
 - Medical Ethics Manual. World medical association. Third edition 2015.
 - Medical ethics and law. Dominic Wilkinson, 3rdedition 2019.

iii. Recommended books

• Biswas Gautam (2021): Review of Forensic Medicine & Toxicology. 5th ed. Jaypee Brothers Medical Pub.

iv. Journal and web site

- Journals of all Egyptian Universities of Forensic Medicine and Clinical Toxicology.
- All International Journals of Forensic Medicine and Clinical Toxicology which available in the university network at www.sciencedirect.com. As:
 - o Forensic Science International Journal.
 - o Toxicology Letter.

v. others

8. Signatures

- Course Coordinator: Prof. Ghada Omran	- Head of the Department: Prof Randa Hussein Abdel - Hady
Date: 17/4/2022	Date: 17/4/2022

Course 4: Cytogenetics

Name of department:

Clinical Pathology

Faculty of medicine Assiut University

2022-2023

1. Course data

- **4** Course Title: Cytogenetics.
- **4** Course code: CCP331A.
- **\$\infty: Clinical pathology (1st part).**
- **♣ Number of credit points: 2 credit point** for didactics (100%), 0 CP for training (0%), and total CP: 2CP.
- **♣ Department** (s) delivering the course: Clinical Pathology department.
- **♣ Coordinator** (s): According to annual approval of council department.

Date last reviewed: 5/2022

- **Requirements** (prerequisites) if any:
 - Completed Master degree.

2. Course Aims

2.1To describe the updated knowledge and principles of Cytogenetics relevant to practice in the field of Clinical Pathology subspeciality.

3. Course Intended learning outcomes (ILOs):

A knowledge and understanding

ILOs	Methods of teaching/ learning	Methods of Evaluation
 A. Illustrate cytogenetic principles of: Cell cycle, the processes of mitosis and meiosis, the stages of these processes and common abnormalities. Method for obtaining chromosome preparations from a blood sample. Numerical chromosome abnormalities; Origin of aneuploidy; Mosaicism; Chimaeras; Origin and consequences of structural abnormalities: translocations, inversions, insertions, deletions, rings, markers; Risk assessment for balanced abnormalities; X inactivation, numerical and structural abnormalities of the X and the Y; Mechanism of formation of chromosome abnormalities. Banding cytogenetic. (Nomenclature) karyotypes description. Major dysmorphic features related to common chromosome aneuploidies. Fluorescence (FISH), the technical considerations for FISH, and the main service applications of FISH in cytogenetics & identification of FISH probe types appropriate to specific diagnostic situations and interpret 	-Didactic (lectures, seminars, tutorial)	- Written and oral examination - Log book

FISH results.

- New methods in cytogenetics.
- Chromosomal abnormalities related diseases.
- B. Describe Cytogenetics details of conditions mentioned in AA.

B-Intellectual outcomes

ILOs	Methods of teaching/	Methods of Evaluation
A. Apply the basic (cytogenetics) supportive sciences which are appropriate to clinical pathology related problems. B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to clinical pathology	(lectures, seminars,	-Written and oral examination - Log book

C-Practical skills

Practical: 0 credit point

D- General Skills Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Use information technology to manage information, access on-line medical information; and support their own education	-Observation and supervision -Written and oral communication	Log book

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
B. Write a report in common condition mentioned in A.A, A.B	-Clinical round -Seminars -Lectures	-Log book -Chick list

Professionalism

ILOs	Methods of teaching/ Learning	Methods of Evaluation
C. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest.	- Observation and supervision Written & oral communication	structured clinical

Systems-Based Practice

ILOs	Methods of	
	teaching/	Evaluation
	learning	
D. Work effectively in different health care delivery settings and systems.	-Observation -Senior staff experience	-360o global rating

4. Course contents (topics/modules/rotation Course Matrix

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectua l	Practica l skills C	General Skills D
	A	В	C	D
Cell cycle ,the processes of	A,B	A.B	-	A-D
mitosis and meiosis, the stages of				
these processes and common				
abnormalities.				
Method for obtaining	A,B	A.B	-	A-D
chromosome preparations from				
a blood sample. Numerical chromosome	Λ D	A.B		A-D
abnormalities; Origin of	A,B	A.D	-	A-D
aneuploidy; Mosaicism;				
Chimaeras; Origin and				
consequences of structural				
abnormalities: translocations,				
inversions, insertions, deletions,				
rings, markers; Risk assessment				
for balanced abnormalities; X				
inactivation, numerical and				
structural abnormalities of the X				
and the Y; Mechanism of formation of chromosome				
abnormalities.				
Banding cytogenetic	A,B	A.B	_	A-D
Nomenclature, karyo types	A,B	A.B	-	A-D
description.	,			-
Major dysmorphic features	A,B	A.B	-	A-D
related to common chromosome				

aneuploidies.				
Fluorescence (FISH), the	A,B	A.B	-	A-D
technical considerations for				
FISH, and the main service				
applications of FISH in				
cytogenetics & identification of				
FISH probe types appropriate to				
specific diagnostic situations and				
interpret FISH results				
New methods in cytogenetics.	A,B	A.B	-	A-D
Chromosomal abnormalities	A,B	A.B	-	A-D
related diseases				

5. Course Methods of teaching/learning:

- 1. Lectures.
- 2. Tutorials.
- 3. Training.
- 4. Seminars.

6. Course assessment methods:

i. Assessment tools:

- 1. Written examination.
- 2. Attendance and active participation.
- 3. Oral examination.
- **ii. Time schedule:** After 12 months from applying to the M D degree.
- iii. Marks: 100 (50 for written exam and 50 for oral exam).

7. List of references

i. Lectures notes

- Course notes.
- Staff members print out of lectures and/or CD copies.
- ii. Essential books; Cytogenetic Laboratory Management: Chromosomal, FISH and Microarray-Based Best Practices and Procedures,by Susan Mahler Zneimer | Jan 27, 2017

iii. Recommended books: Principles of Genetics and Cytogenetics; by Senthil N. Krishnan V. | Jan 1, 2017, KALYANI

iv. Journal and web site v. others

8. Signatures
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- Course Coordinator:	- Head of the Department:
Prof. Maged salah	Prof. Azza Mahmoud Ezz- Eldin
Date:	Date: :

Course 5: Molecular Biology

Name of department: Name of department:

Clinical Pathology

Faculty of medicine

Assiut University

2022-2023.

1. Course data

Lesson Course Title: Molecular Biology.

Les Course code: CCP331B.

4 Speciality: Clinical pathology (1st part).

- **♣ Number of credit points: 1.5 credit point** for didactics (75%), 0.5 CP for training(25%), and total CP: 2 CP(100%).
- **♣ Department** (s) delivering the course: Clinical Pathology department.
- **♣ Coordinator** (s): According to annual approval of council department.

Date last reviewed: 5//2022

- Requirements (prerequisites) if any :
 - Completed Master degree.

2. Course Aims

2.1.To describe the updated knowledge and principles of Molecular Biology relevant to practice in the field of Clinical Pathology subspeciality.

3. Course intended learning outcomes (ILOs):

A- Knowledge and understanding

Tro				
ILOs		Methods of		
	teaching/	Evaluation		
	learning			
A. Mention Principles of the following Molecular	-Didactic	- Written and		
Biology:	(lectures,	oral		
 Structure and function of nucleic acid. 	seminars,	examination		
Basic processes involved in gene replication	tutorial)	- Log book		
and repair.				
Gene expression.				
DNA recombination.				
Biomolecular tools:				
-Blotting.				
-Hybridization.				
-Transfection and Transformation.				
- Reporter gene assay.				
Biomolecular Techniques:				
- PCR				
-Southern blotting.				
-Northern blotting.				
-Western blotting.				
- Gell shift assay.				
- DNA sequencing.				
- DNA foot printing.				
 Importance of molecular biology techniques in 				
laboratory diagnosis				
B. Describe details of conditions related to AA.				

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Apply the basic (Molecular biology) supportive sciences which are appropriate to Clinical pathology related problems.	-Didactic (lectures, seminars, tutorial)	-Written and oral examination - Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Clinical pathology.		

C- Practical skills C-Practical skills (Patient Care)

ILOs	Methods of	Methods of		
	teaching/	Evaluation		
	learning			
A. Take history, examine and clinically diagnose different conditions related to molecular biology and clinical pathology	-Clinical rounds -Seminars -Clinical rotations (service teaching)	Checklist Log Book, Record review, Global rating, Simulations, Portfolios, Standardized oral examination, Written examination, Procedure exam./ case log MD students will be formally reviewed formative assessment log book		
B. Recommend the following non invasive/invasive diagnostic procedures	Clinical round with senior staff	1		
- PCR.	Observation	- CHICK HSt		

 - DNA extraction - RNA extract by chemical and automated extraction. - PCR amplification of specific gene segments - agarose gel and agarose electrophoresis of PCR Products. - Southern blotting. - Northern blotting. 	Post graduate teaching Hand on workshops	
Western blotting.Gel shift assay.DNA sequencing.DNA foot printing.		
C. Interpret the following non invasive/invasive diagnostic procedures; - PCR DNA extraction - RNA extract by chemical and automated extraction PCR amplification of specific gene segments - agarose gel and agarose electrophoresis of PCR Products Southern blotting Northern blotting Western blotting Gel shift assay DNA sequencing DNA foot printing.	Clinical round with senior staff	Procedure presentation - Log book
 D. Perform the following non invasive/invasive diagnostic procedure - PCR. - DNA extraction - RNA extract by chemical and automated extraction. - PCR amplification of specific gene 	Clinical round with senior staff -Perform under supervision of senior staff	1

segments - agarose gel and agarose electrophoresis of PCR ProductsSouthern blotting Northern blotting Western blotting Gel shift assay DNA sequencing DNA foot printing.	
E. Develop patient management plans for the following molecular biology problems in clinical pathology	
F. Counsel and educate patients and their family about the condition mentioned in A. A & A.B	
G. Use information technology to support patient care decisions and patient education for molecular biology problems in clinical pathology related conditions.	
H. Provide health care services aimed at preventing the following conditions related to molecular biology problems in clinical pathology	
I. Work with health care professionals, including those from other disciplines, to provide patient-focused care about the condition mentioned in A. A & A.B	
J. Write competently all forms of professional reports related to the Immunology (lab reports)	

D-General Skills

Practice-Based Learning and Improvement

Tractice-based Learning and Improvement			
ILOs	Methods of	Methods of	
	teaching/	Evaluation	
	learning		
A. Perform practice-based improvement activities using a systematic methodology in the common problems (plain and conduct audit cycles)	Journal club, case presentation, observation and supervision, Written and oral assignments, Conference	Procedure/case presentation -Log book and Portfolios	
B. Locate, appraises, and assimilates evidence from scientific studies related to patients' health problems.	Journal clubs, Discussions in seminars and clinical rounds		
C. Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness			
D. Use information technology to manage information, access on-line medical information; and support their own education			
E .Lead the learning of students and other health care professionals.			

Interpersonal and Communication Skills

ILOs	Methods of	Methods of
	teaching/	Evaluation
	learning	Charlint I an
F. Create and sustain a therapeutic and	Lectures, seminars,	Checklist Log
ethically sound relationship with	case presentation,	Book,
patients	observation and	Record review,
	supervision,	Global rating,
	Written and oral	Simulations,
	assignments,	Portfolios,
	Conference	Standardized
		oral
		examination
G. Perform the following oral		
communications and interpretation of		
results of different investigation related		
to the mentioned conditions		
to the mentioned conditions		
H. Fill the following reports:		
hematological report related to the		
mentioned conditions		
I. Work effectively with others as a		
member or leader of a health care team		
e.g. in labor ward		

Professionalism

ILOs	Methods of	Methods of
	teaching/	Evaluation
	Learning	
J. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest.	Lectures, seminars, case presentation, observation and supervision, Written and oral assignments, Conference	1. Objective structured clinical examination 2. Patient survey
K. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.	Comerciae	1. 360o global rating
L. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching learning	Methods of Evaluation
M. Work effectively in different health care delivery settings and systems related to the module.	Lectures, seminars, observation and supervision, Written and oral assignments, Conference	1. 360o global rating
N. Practice cost-effective health care and resource allocation that does not compromise quality of care in this module		1. Check list evaluation of live or recorded performance
O. Advocate for quality patient care and assist patients in dealing with system complexities		 360o global rating Patient survey
P. Partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance		

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

Time Schedule: First Part

Topic		Covered II	LOs	
-	Knowledge	Intellectua	Practica	General
		l	l skills	Skills
	A		C	D
		В		
Structure and function of nucleic	A,B	A.B	-	В-Е
acid.				
Basic processes involved in gene	A,B	A.B	-	В-Е
replication and repair.				
Gene expression.	A,B	A.B	-	В-Е
DNA recombination	A,B	A.B	-	В-Е
Biomolecular tools:	A,B	A.B	A-J	A-P
-Blotting.				
-Hybridization.				
-Transfection and				
Transformation.				
- Reporter gene assay.				
• Biomolecular Techniques:	A,B	A.B	A-J	A-P
- PCR				
-Southern blotting.				
-Northern blotting.				
-Western blotting.				
- Gell shift assay.				
- DNA sequencing.				
- DNA foot printing.				
 Importance of molecular 	A,B	A.B	-	B-J
biology techniques in				
laboratory diagnosis				

5. Course methods of teaching/learning:

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

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

Extra didactic (lectures, seminars, tutorial)

7. Course Unit assessment methods:

- i. Assessment tools:
 - 1. Written, practical and oral examination
 - 2. Log book
- ii. Time schedule: At the end of the first part
- **iii. Marks:** 100 Marks (50 marks for written +20 marks for oral+ 30 marks for practical)

8. List of references

- i. Lectures notes
- Course notes
- Staff members print out of lectures and/or CD copies
- ii. Essential books: Molecular Biology Book, Third Edition, 2019.
- iii. Recommended books: Molecular Biology: Concepts for Inquiry,by Jennifer A. Hackett and Julia Masters | Oct 13, 2018,Kindle Unlimited
- iv. Periodicals, Web sites, ... etc
- > Periodical
- ➤ Web sites:

9. Signatures

Course Coordinator:	Head of the Department:
Prof.	Prof. Azza Mahmoud Ezz- Eldin
Date:	Date: :

Course 6: Instrumentation and Equipments

Name of department: Clinical Pathology

Faculty of medicine

Assiut University

2022-2023

1. Course data

- **4** Course Title: Instrumentation and Equipments
- **Course code:** CCP331C.
- **4** Speciality: Clinical pathology (1st part).
- **♣ Number of credit points: 3 credit points** for didactics (100%), 0 CP for training (0%), and total CP: 3CP.
- **♣ Department** (s) delivering the course: Clinical Pathology department.
- **♣ Coordinator** (**s**): According to annual approval of council department.

Date last reviewed: 5/2022

- Requirements (prerequisites) if any :
 - **4** Completed Master degree.

2. Course Aims

2.1. To describe the updated knowledge and principles of Instrumentation and Equipments relevant to practice in the field of Clinical Pathology subspeciality.

3. Course intended learning outcomes (ILOs):

A-Knowledge and understanding

ILOs	Methods of teaching/	Methods of Evaluation
	learning	
A. Mention Principles of Instrumentation and	-Didactic	- Written and
Equipments	(lectures,	oral
Nature of light.	seminars,	examination
 Spectrophotometry. 	tutorial)	- Log book
 Reflectance photometry. 		
 Flame emission spectrophotometry. 		
Fluorometry.		
Chemiluminesence, Bioluminesence and		
electro chemiluminescence.		
 Nephelometry and turbidimetry. 		
Microscopy.		
• Electrophoresis.		
• Chromatography.		
Principles of Immunochemical		
Techniques:		
o Basic concept		
 Antibodies and Immunogen. 		
 Antigen antibody binding forces. 		
Oualitative Methods:		
 Quantitative Methods: 		
 Interference in Immunoassays. 		
 Other immunochemical techniques 		
B. Describe Instrumentation and Equipments details of condition mentioned in AA.		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Apply the basic (Instrumentation and Equipments) supportive sciences which are appropriate to Clinical pathology related problems.	-Didactic (lectures, seminars, tutorial)	-Written and oral examination - Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Clinical pathology and Instrumentation and Equipments.		

C-Practical skills

Practical: 0 credit point

D- General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Use information technology to manage information, access on-line medical information; and support their own education	-Observation and supervision -Written and oral communication	Log book

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
B.Write a report in common condition mentioned in A.A, A.B		-Log book -Chick list

Professionalism

ILOs	Methods of	Methods of
	teaching/	Evaluation
	Learning	
C. Demonstrate respect, compassion, and	- Observation	- Objective
integrity; a responsiveness to the needs of	and	structured
patients and society that supersedes self-	supervision	clinical
interest.	Written & oral	examination
interest.	communication	- Patient survey

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
D. Work effectively in different health care delivery settings and systems.	-Observation -Senior staff experience	-360o global rating

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

Time Schedule: First Part

Topic	Covered ILOs			
	Knowled	Intellectua	Practica	General
	ge	1	l skills	Skills
	A	В	C	D
Nature of light	A,B	A	-	A-D
Spectrophotometry.	A,B	A.B	-	A-D
Reflectance photometry	A,B	A.B	ı	A-D
Flame emission spectrophotometry	A,B	A.B	-	A-D
Fluorometry	A,B	A.B	-	A-D
Chemiluminesence, Bioluminesence	A,B	A.B	-	A-D
and electro chemiluminescence.				
Nephelometry and turbidimetry	A,B	A.B	-	A-D
Microscopy.	A,B	A.B	-	A-D
Electrophoresis.	A,B	A.B	-	A-D
Chromatography	A,B	A.B	-	A-D
Principles of Immunochemical	A,B	A.B	-	A-D
Techniques				
 Basic concept 				
 Antibodies and Immunogen. 				
o Antigen antibody binding				
forces.				
Qualitative Methods:				
Quantitative Methods:				
 Interference in Immunoassays. 				
o Other immunochemical				
techniques				

5. Course methods of teaching/learning:

- 5. Didactic (lectures, seminars, tutorial)
- 6. Observation and supervision
- 7. Written & oral communication
- 8. Senior staff experience

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

1. Extra didactic (lectures, seminars, tutorial)

7. Course assessment methods:

- i. Assessment tools:
 - 1-Written and oral examination
 - 2-Log book
- ii. Time schedule: At the end of the first part
- iii. Marks: 150 Marks (100 marks for written + 50 marks for oral exam).

8. List of references

- i. Lectures notes
- Course notes
- Staff members print out of lectures and/or CD copies
- ii. Essential books: Tietz Fundamentals of clinical chemistry, by Carl A. Burtis PhD and David E. Bruns MD | 6th edition, Nov 20, 2007.
- iv. Periodicals, Web sites, ... etc
- > Periodicals,
- > Web sites:

9. Signatures

Course Coordinator:	Head of the Department:
Prof. Maged salah	Prof. Azza Mahmoud Ezz- Eldin
Date:	Date:

Course 7/ Clinical Pathology (Advanced)

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

I. Course data

It is divided into four modules; one of them will be chosen by the candidate as a main specialized module and the others will be considered subsidiary modules. The modules of these courses are the following:

- 1- Module 1 Hematology
- 2- Module 2 Clinical Chemistry
- 3- Module 3 Microbiology
- 4- Module 4 Clinical Immunology
- Course Title: Clinical Pathology (Advanced)
- Course code: CCP331D
- ♣ Speciality: Clinical Pathology. Number of teaching Points: Didactic 24CP (%) practical 123 CP (%) total 147CP
- **Department** (s) delivering the course: Clinical Pathology
- Department-Faculty of Medicine- Assiut- EGYPT.
- **♣** Requirements (prerequisites) if any: 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 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, microbiology, 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 subspeciality 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 enable them to start professional careers as specialists in Egypt;
- To make them recognized as specialists abroad.
- To enable them to pursue higher studies and subspecialties.
- To Enable them to understand and get the best of published scientific research and do their own.
- To be Updating their knowledge and self learning.
- -To 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):

Course 4; Module 1 Hematology A-Knowledge and understanding

Methods of teaching/ learning	Methods of Evaluation
the following: system seminars, tutorial, journal club, case presentation, observation and supervision, Written and oral	Global rating, Simulations, Portfolios, Standardized
assignments t of Blood Cells. Is f Hematopoietic Growth bin of Erythropoiesis	Written examination, Procedure exam./ case log MD students will be formally reviewed formative assessment log book
bin	

- The Erythrocyte Membrane and Cytoskeleton
- Hemoglobin and Erythrocyte Function
- Erythrocyte Metabolism and enzymes
- -Red Blood Cell Antigens
- -Granulocytes:
- * Neutrophilic Leukocytes
- Structure and Development of Neutrophils and Their Precursors
- Neutrophil Function
- Control Mechanisms Regulating Neutrophil Production
- * Eosinophil
- Eosinophil Differentiation and Eosinophil Mediators
- * Basophilic Leukocytes
- Function and Characteristics of Mast Cells and Basophils
- * Mononuclear Phagocytes
- Mononuclear Phagocyte Production and Kinetics
- * White Blood Cell Antigens
- Granulocyte Antigens and it is Clinical Significance
- -Major Histocomptability Complex (Human leukocyte antigen) and it is clinical Significance
- The Lymphocytes
- -Types and Morphology of Lymphocytes
- Lymphoid Organs
- Lymphocyte Antigens and receptors
- Megakaryocytes
- Cellular Basis and extrinsic regulation of megakaryopoiesis

- Platelet Structure and Function
- Platelet Granules and Organelles
- Platelet Antigens
- Blood Coagulation and Fibrinolysis
- Coagulation Pathways and procoagulant protein
- Anticoagulant protein
- Physiologic Regulation of Fibrinolysis
- 8- Vascular wall and Endothelium

- Disorders of red cells

- 1- Evaluation and Classification of Anemia
- ** Macrocytic Anemia
- Megaloblastic Anemias
- Nonmegaloblastic Macrocytic Anemias
- ** Microcytic Anemia
- Iron Pathway Disorders
- Disorders of Hemoglobin Synthesis
- Sideroblastic Anemias:
- •Hereditary/Congenital Sideroblastic Anemias Hereditary Patterns , Pathogenesis, and Genetic Defects
- Acquired Clonal Sideroblastic Anemia
- **Normocytic Anemia
- -Pathogenesis and Classification of Hemolytic anemias
 - Congenital Hemolytic Anemia
 - Acquired Hemolytic Anemia
- Destruction of Erythrocytes
- Mechanisms and Site of Red Cell Destruction:
 - Extravascular Hemolysis
 - Intravascular Hemolysis
- Hemolytic Anemia:
- * Hereditary Spherocytosis, Hereditary

Elliptocytosis, and Other Disorders Associated with Abnormalities of the Erythrocyte Membrane

- * Hereditary Hemolytic Anemias Due to Red Blood Cell Enzyme Disorders
- * Autoimmune Hemolytic Anemia
- Classification , Etiology of the Immune Response in AIHA
- Mechanism of Immune-Mediated RBC Lysis
- -Immune Hemolytic Anemias Caused By Cold-Active Antibodies
- Immune Hemolytic Anemias Caused by Mixed Cold- and Warm-Active Antibodies -Immune Hemolytic Anemias Caused by Warm-
- -Immune Hemolytic Anemias Caused by Wa Active Antibodies
- *Alloimmune Hemolytic Disease
- * Acquired Nonimmune Hemolytic Disorders
- * Hereditary Disorders of Hemoglobin Structure and Synthesis
- Sickle Cell Anemia and Other Sickling Syndromes
- Thalassemias and Related Disorders
- Quantitative Disorders of Hemoglobin Synthesis
- Hemoglobins with Altered Oxygen Affinity, Unstable Hemoglobins, M-Hemoglobins, and Dyshemoglobinemias
- * Inherited Aplastic Anemia Syndromes (e.g. Fanconi Anemia)
- * Acquired Aplastic Anemia
- *Adult Pure Red Cell Aplasia , Diamond-Blackfan Anemia
- * Porphyria
- * Hemochromatosis
- -Iron Overload
- -Etiology, Pathophysiology, Differential Diagnosis of Iron Overload
- * Paroxysmal Nocturnal Hemoglobinuria
- * Congenital Dyserythropoietic Anemias
- * Anemias Secondary to Chronic Disease and Systemic Disorders
- * Anemias During Pregnancy and the Postpartum

Period

- * Neonatal Anemia
- * Erythrocytosis
- -Relative Polycythemia
 - -Polycythemia (Absolute Erythrocytosis)

-Nonmalignant Disorders of Leukocytes, the Spleen, and/or Immunoglobins

- * Quantitative Disorders of Leukocytes
- * Qualitative Disorders of Leukocytes
- Disorders of Phagocytic Leukocytes Characterized by Morphologic Changes
- Functional Disorders of Leukocytes
- * Abnormalities of the Monocyte-Macrophage

System: The Lysosomal Storage Diseases

- -Gaucher Disease
- -Niemann-Pick Disease
- * Langerhans Cell Histiocytosis
- * Infectious Mononucleosis
- * Primary and aquired Immunodeficiency Syndromes
- * Disorders of the Spleen

-Hematologic Malignancies

- * Acute Leukemias
- Molecular Genetics and Cytogenetic of Acute Leukemia
- Diagnosis and Classification of the Acute Leukemias
- Acute myloid leukaemia
- Acute lymphoblastic leukaemia
- * Myelodysplastic Syndromes
- Cytogenetic and Molecular Abnormalities
- Diagnosis and Classification of MDS
- * Myeloproliferative Disorders
- Chronic Myeloproliferative Disorders
- Mixed Myeloproliferative/Myelodysplastic

Syndromes

- Chronic Myeloid Leukemia Pathophysiology of CML ,Stages of Disease, Clinical Presentation, Clinical Course and Diagnostic Approach to CML
- Polycythemia Vera
- Primary Myelofibrosis
- Systemic Mastocytosis
- * Lymphoproliferative Disorders
- Chronic Lymphocytic Leukemia

Pathophysiology, Investigations and Staging

- Diagnosis and Classification of Lymphomas
- Molecular Genetic and Cytogenetic Aspects of Non-Hodgkin Lymphomagenesis
- Hairy Cell Leukemia
- Cutaneous T-Cell Lymphoma: Mycosis Fungoides and Sézary Syndrome
- Hodgkin Lymphoma
- * Plasma Cell Dyscrasias
- Neoplastic Immunoglobulin Disorders
- Nonneoplastic Immunoglobulin Disorders
- Multiple Myeloma
- Monoclonal Gammopathies of Undetermined Significance and Smoldering Multiple Myeloma
- Immunoglobulin Light-Chain Amyloidosis
- Waldenström Macroglobulinemia
- Cryoglobulinemia and Heavy Chain Disease

- Disorders of haemostasis

Diagnostic Approach to the Bleeding Disorders

* Bleeding Disorders Caused by Vascular

Abnormalities

- * Quantitative platelet disorders
 - -Pathophysiology and Classification
- Thrombocytopenia Caused by Immunologic

Platelet Destruction

- Thrombotic Thrombocytopenic Purpura, Hemolytic-Uremic Syndrome, and Related Disorders

- Miscellaneous Causes of Thrombocytopenia
- * Qualitative (inherited and acquired) Disorders of Platelet Function
- * Essential Thrombocythemia and Thrombocytosis
- * Inherited and Acquired Coagulation Disorders
- * Fibrinolysis and its disorders
- * Disseminated intravascular coagulation
- * Inherited and acquired thrombophilia
- * Antithrombotic Therapy

-Transfusion Medicine

- Red Cell immunohematology:
- Red Blood Cell Antigens
- Red Cell Blood Group Systems
- Blood Donation and Collection Blood

Component Separation

- Automated Blood Collection and Separation

Devices: Apheresis

- Complications of Donation
- Donor Testing
- Blood Donor Screening for Infectious Diseases
- Red Blood Cell Preservation and Storage
- Anticoagulant/Preservative Solutions
- Changes in Red Cells during Storage
- -Blood Component Modification:
- Leukocyte Reduction
- Washed Products
- Irradiation of Blood Products
- Pathogen inactivation
- -Use of Blood Components
- Autologous Blood Donation
- Directed Donations
- * Red Cell Transfusion

Pretransfusion Testing of Red Cells

- Compatibility Testing Process
- Blood Grouping
- Weak D
- Testing for Red Cell Antibodies

- Antiglobulin Test
- Media That Enhance Agglutination
- Crossmatching Problems
- Pseudoagglutination
- Autoagglutination
- Alloantibody to High-Incidence Antigens
- Polyagglutination
- Special Considerations in Neonatal Transfusion
- *Platelet Transfusion
- Preparation of Platelet Concentrates
- Apheresis (Pheresis) Platelets
- Platelet Storage
- Selection of Platelet Donors
- Indications for Platelet Transfusion
- -Platelet Refractoriness and Alloimmunization
 - * Granulocyte Transfusions
- * Plasma Components for Transfusion
- * Stem cell transfusion therapy
- * Adverse Effects of Blood Transfusion
- Immunologic Transfusion Reactions
- Alloimmunization to Transfused Antigens

Hemolytic Transfusion Reactions

- Febrile Nonhemolytic Transfusion Reactions
- Nonimmunologic Adverse Effects of Blood Transfusion
- Massive Transfusion
- Infectious Complications of Blood Transfusion
- Therapeutic Plasma Exchange
- * Antenatal serology and haemolytic disease of newborn

- Miscellaneous

- Cell biology and cell cycle
- Stem cell transplantation and histocompatibility
- Hematologic aspect of systemic and tropical diseases
- Minimal Residual disease
- -Gene therapy of haemopoietic disorders

- Neonatal hematology

- Laboratory Hematology

- * Quality control/Assurance: Safety, performance and evaluation
- * Examination of the Blood and Bone Marrow
- Specimen Collection and handling of blood
- Manual CBC
- Principles Automated hematology and interpretation of reports
 - Red Blood Cell Analytic Parameters
 - Leukocyte Analysis
- Platelet Analysis
- Advantages and Sources of Error with Automated Hematology Analyzers
 - Instrument maintenance
- Reliability of Tests
- * Morphologic Analysis of Blood Cells
- Preparation of Blood Smears
- Routine Staining of Blood Smears
- Examination of the Blood Smear
- * Bone Marrow Examination
- Bone Marrow Aspiration and Biopsy
- Staining and Evaluation of Bone Marrow Aspirates and Touch Preparations
- Cytochemical Stains
- Immunocytochemical Stains
- Blood parasite
- *Other Laboratory Studies:
- * Reticulocyte estim.
- * Erythrocyte Sedimentation Rate
- * Plasma and Blood Viscosity
- * Blood Volume Measurement
- * Methods for Estimating Erythrocyte Lifespan
- * Assessment of Phagocytic Function
- * Investigation and differential diagnosis of anaemias:
- * Measurement of Serum Iron and Iron-Binding

Capacity

- Serum Ferritin
- Evaluation of Bone Marrow Iron Stores
- Transferrin Receptors
- * General Diagnostic Approach to

Hemoglobinopathies and Thalassemias:

- HB electrophoresis
- Quantitation of HB F and A2
- Sickling test
- * Laboratory Tests Useful in the Differential

Diagnosis of Hemolysis

- Direct Antiglobulin Test
- Osmotic Fragility Test
- Screening for G6PD
- * Tests for Hemolytic Disorders Associated with Heinz Body Formation
- * Diagnostic Strategy to the Patient with Hemolytic Anemia
- * Investigation of megaloblastic anemia
- * Clinical Flow Cytometry
- Principles and Instrumentation
- Flow Cytometry in Hematology and reporting results
- * Immunophenotyping technique
- * Cytogenetics analysis
- Cytogenetic Methods
- Cytogenetic Nomenclature
- Numerical Chromosomal Abnormalities
- Structural Chromosomal Abnormalities

Clinical Applications of Cytogenetics

- * Molecular Genetics and Hematology
- -Basic Principles
- DNA Chemistry and Structure
- Genomic Diversity
- Pathologic Changes in the Genome
- Molecular Diagnostics:
- Southern Blot Analysis

- Northern Blot Analysis	
- In situ Hybridization	
- Microarray Analysis	
- Polymerase Chain Reaction Analysis	
- Analysis of Gene Function	
Tests of haemostasis:	
* Laboratory approach to the diagnosis and	
classification of bleeding tendancy	
* Screening tests of haemostasis	
* Defects of primary haemostasis	
* Platelet function tests	
* Investigation of Coagulation factor deficiency	
* Investigation of a patient with circulating	
anticoagulant or inhibitors	
* Investigation of VWD	
*Investigation of DIC	
* Investigation of thrombophilia	
* Laboratory control of anticoagulant	
* Laboratory aspects of blood transfusion:	
-Blood grouping	
- Antibody screening and identification	
- Cross matching	
- Serological tests	
* Diagnosis of transfusion reactions	
* Transfusion therapy techniques:	
Preparation of blood components	
Apharesis	
* Case presentation	
-Describe the etiology, clinical picture, and	
diagnosis of the following diseases and clinical	
conditions:	
Anemia	
- Megaloblastic Anemias	
- Nonmegaloblastic Macrocytic Anemias	
** Microcytic Anemia	
- Iron Pathway Disorders	
- Disorders of Hemoglobin Synthesis	

- Sideroblastic Anemias:
- •Hereditary/Congenital Sideroblastic Anemias Hereditary Patterns, Pathogenesis, and Genetic Defects
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 - Intravascular Hemolysis
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- * Autoimmune Hemolytic Anemia
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- Mechanism of Immune-Mediated RBC lysis
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- Immune Hemolytic Anemias Caused by Mixed Cold- and Warm-Active Antibodies
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- * Hemochromatosis
- -Iron Overload
- -Etiology, Pathophysiology, Differential Diagnosis of Iron Overload
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- Functional Disorders of Leukocytes
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- -Niemann-Pick Disease
- * Langerhans Cell Histiocytosis
- * Infectious Mononucleosis

- * Primary and acquired Immunodeficiency Syndromes
- * Disorders of the Spleen
- -Hematologic Malignancies

Acute Leukemias

- Molecular Genetics and Cytogenetic of Acute Leukemia
- Diagnosis and Classification of the Acute Leukemias
- Acute myloid leukaemia
- Acute lymphoblastic leukaemia
- * Myelodysplastic Syndromes
- Cytogenetic and Molecular Abnormalities
- Diagnosis and Classification of MDS
- * Myeloproliferative Disorders
- Chronic Myeloproliferative Disorders
- Mixed Myeloproliferative/Myelodysplastic Syndromes
- Chronic Myeloid Leukemia

Pathophysiology of CML, Stages of Disease,

Clinical Presentation, Clinical Course and

Diagnostic Approach to CML

- Polycythemia Vera
- Primary Myelofibrosis
- Systemic Mastocytosis
- * Lymphoproliferative Disorders
- Chronic Lymphocytic Leukemia

Pathophysiology, Investigations and Staging

- Diagnosis and Classification of Lymphomas
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- Cutaneous T-Cell Lymphoma: Mycosis Fungoides and Sézary Syndrome
- Hodgkin Lymphoma
- * Plasma Cell Dyscrasias
- Neoplastic Immunoglobulin Disorders

- Nonneoplastic Immunoglobulin Disorders	
- Multiple Myeloma	
- Monoclonal Gammopathies of Undetermined	
Significance and Smoldering Multiple Myeloma	
- Immunoglobulin Light-Chain Amyloidosis	
- Waldenström Macroglobulinemia	
- Cryoglobulinemia and Heavy Chain Disease	
- Disorders of haemostasis	
Diagnostic Approach to the Bleeding Disorders	
* Bleeding Disorders Caused by Vascular	
Abnormalities	
* Quantitative platelet disorders	
-Pathophysiology and Classification	
- Thrombocytopenia Caused by Immunologic	
Platelet Destruction	
- Thrombotic Thrombocytopenic Purpura,	
Hemolytic-Uremic Syndrome, and Related	
Disorders	
- Miscellaneous Causes of Thrombocytopenia	
* Qualitative (inherited and acquired) Disorders of	
Platelet Function	
* Essential Thrombocythemia and Thrombocytosis	
* Inherited and Acquired Coagulation Disorders	
* Fibrinolysis and its disorders	
* Disseminated intravascular coagulation	
* Inherited and acquired thrombophilia	
* Antithrombotic Therapy	
C. State update and evidence based Knowledge of	
conditioned mentioned in A &B	
D. Explain the facts and principles of the relevant	
basic and clinically supportive sciences related to	
hematology	
E. Explain the facts and principles of the relevant	
basic and clinically supportive sciences related to	
hematology	
F.Describe the basic ethical and medicolegal	
principles revenant to the hematology.	

G.Describe the basics of quality assurance to ensure	
good clinical care in hematology	
H. Explain the ethical and scientific principles of	
medical research	
I. Explain the impact of common health problems in	
the field of hematology on the society.	

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Design / present case in common problem related to hematology	Lectures, seminars, tutorial, journal club, case presentation, observation and supervision, Written and oral assignments	Simulations, Portfolios, Standardized oral examination, Written
B. Apply the basic and clinically supportive sciences which are appropriate to the hematology related conditions / problem / topics. C. Demonstrate an investigatory and analytic thinking "problem – solving "approaches to clinical situation related to hematology		

D. Plan research projects.	
E. Write scientific papers.	
F. Lead risk management activities as a part of	
clinical governs.	
G. Plan quality improvement activities in the	
field of medical education and clinical practice	
in hematology.	
H. Create / innovate plans, systems, and other	
issues for improvement of performance in his	
practice.	
I. Present and defend his / her data in front of a	
panel of experts	
J. Formulate management plans and alternative	
decisions in different situations in the field of	
hematology	

C-Practical skills (Patient Care)

ILOs	Methods of	Methods of
	teaching/ learning	Evaluation
A. Take history, examine and diagnose different conditions related to hematology	Didactic; -Lectures -Clinical rounds -Seminars -Clinical rotations (service teaching)	Checklist Log Book, Record review, Global rating, Simulations, Portfolios, Standardized oral examination, Written examination, Procedure exam./ case log MD students will be formally reviewed formative assessment log book
B. Recommend the following non invasive/invasive diagnostic procedures	Clinical	Procedure presentation

1- Specimen Collection and handling of blood	round with	- Log book
Techniques	senior staff	- Chick list
- Precaution	Observation	
- Anticoagulants	Post	
2- Complete Blood cell count	graduate	
- Manual CBC	teaching	
- Automated blood counting	Hand on	
- Staining of Blood Smears	workshops	
3- Reticulocyte staining		
4- Erythrocyte Sedimentation Rate		
5- Bone Marrow Examination		
- Bone Marrow Aspiration and Biopsy		
- Staining Bone Marrow Aspirates.		
6- Cytochemical Stains:		
- Myloperoxidase		
- Sudan black		
- PAS		
- NAP		
- Acid Phosphatase		
- Estrase		
- Others		
7- Blood parasites		
8- Investigation of anaemias:		
- Iron Profile		
- HB electrophoresis		
- Quantitation of HB F and A2		
- Sickling test		
- Direct Antiglobulin Test		
- Osmotic Fragility Test		
- Screening for G6PD		
- Erythropoietin assay		
9- Flow Cytometry technique		
10- Immunophenotyping technique		
11- Screening tests of haemostasis:		
- Bleeding time		
- Prothrombin time and concentration		
- activated Partial thromboplastin time		

- Thrombin time		
- Fibrinogen assay		
- FDP		
12- Platelet function tests		
(Investigation of thrombocytopathy)		
13- Coagulation factors assay		
14- VWF assay		
15- Investigation of thrombophilia:		
- Protein S assay		
- Protein C assay		
- Lupus anticoagulant		
16- Blood grouping		
17- Antibody screening and identification		
18-Cross matching		
19- Preparation of blood components		
20- Apharesis		
21- Cytogenetics analysis		
22- Molecular techniques		
C. Interpret the following non	Clinical	Procedure
invasive/invasive diagnostic procedures	round with	presentation
mentioned in.C.B	senior staff	- Log book
D. Perform the following non		Procedure
invasive/invasive diagnostic procedures	Clinical	presentation
mentioned in C.B	round with	- Log book
mentioned in C.B	senior staff	- Chick list
	-Perform	
	under	
	supervision	
	of senior	
	staff	
E. Prescribe the following non	Clinical	Procedure
invasive/invasive therapeutic procedures.	round with	presentation
	senior staff	- Log book
		- Chick list
F. Perform the following invasive/		
therapeutic procedures		

Plasma Paresis	
G. Develop patient management plans for the following problems in hematology	
H. Counsel and educate patients and their family about the condition mentioned in A.B	
I. Use information technology to support patient care decisions and patient education for hematology related conditions.	
J. Provide health care services aimed at preventing the following conditions Related to hematological diseases	
K. Work with health care professionals, including those from other disciplines, to provide patient-focused care about the condition mentioned in B.A	
L. Write competently all forms of professional reports related to the hematology (lab reports)	

D-General Skills Practice-Based Learning and Improvement

ILOs	Methods of	Methods of
	teaching/	Evaluation
	learning	
A. Perform practice-based improvement	Journal club, case	Procedure/case
activities using a systematic	presentation,	presentation
methodology in the common problems	observation and	-Log book and
(plain and conduct audit cycles)	supervision, Written	Portfolios
(pram and conduct addit cycles)	and oral	
	assignments,	

	Conference	
B. Locate, appraises, and assimilates evidence from scientific studies related to patients' health problems.	Journal clubs Discussions in seminars and clinical rounds	
C. Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness		
D. Use information technology to manage information, access on-line medical information; and support their own education		
E. Lead the learning of students and other health care professionals.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/	Methods of Evaluation
	learning	Livaluation
F. Create and sustain a therapeutic and ethically sound relationship with patients	Lectures, seminars, case presentation, observation and supervision, Written and oral assignments, Conference	Checklist Log Book, Record review, Global rating, Simulations, Portfolios, Standardized oral examination
G. Perform the following oral communications and interpretation of results of different investigation		

related to the mentioned conditions in A.A and A.B	
H. Fill the following reports: hematological report related to the mentioned conditions in A.A and A.B	
I. Work effectively with others as a member or leader of a health care team e.g. in labor ward	

Professionalism

ILOs	Methods of teaching/ Learning	Methods of Evaluation
J. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest.	Lectures, seminars, case presentation, observation and supervision, Written and oral assignments, Conference	1. Objective structured clinical examination 2. Patient survey
K. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.		1. 360o global rating
L. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching	Methods of Evaluation
	learning	
M. Work effectively in different health care delivery settings and systems related to the module.	Lectures, seminars, observation and supervision, Written and oral assignments, Conference	-360o global rating
N . Practice cost-effective health care and resource allocation that does not compromise quality of care in this module		- Check list evaluation of live or recorded performance
O. Advocate for quality patient care and assist patients in dealing with system complexities		- 360o globalrating- Patient survey
P. Partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance		

Course 7; Module 2- Clinical Chemistry

A-Knowledge and understanding

ILOs	Methods of	Methods of
	teaching/	Evaluation
	Learning	
A- Outline the detailed of the following:	Lectures,	Checklist
- <u>Carbohydrates</u> :	seminars,	Log Book,
- Regulation of glucose metabolism.	tutorial,	Record
- Laboratory findings in IDDM, NIDDM.	journal club,	review,
- Metabolic complications of Diabetes Mellitus	case	Global
- Hypoglycemia.	presentation,	rating,
- Glycated proteins.	observation	Simulations,
- Inborn errors of carbohydrate metabolism.	and	Portfolios,
- Glycogen storage diseases.	supervision,	Standardized
- <u>Lipid chemistry</u>	Written and	oral
- Classification of lipoproteins and apolipoproteins.	oral	examination,
- Disorders of Lipoprotein metabolism.	assignments	Written
- Significance of apolipoproteins in health and		examination,
disease.		Procedure
- Diagnosis of lipoprotein disorders.		exam./
- Standardization and quality assurance.		case log
- Consideration in lipids and lipoproteins analysis.		MD students
-Amino acids and plasma proteins:		will be
- Basic structure and metabolism.		formally
- Amino acidopathies.		reviewed
- General characteristics of plasma proteins.		formative
- General functions of plasma proteins.		assessment
- Acute phase proteins.		log book
- Plasma proteins and disease.		
- Benign versus malignant monoclonal gammopathy.		
- Disorders of purine metabolism (primary and		
secondary gout).		
- Proteins of body fluids.		
- Renal functions and non protein nitrogenous		
compounds:		

- Biological function of the kidneys.
- Glomerular and tubular functions and the clinical significance of their assessment.
- Glomerular and tubular diseases.
- Types of renal failure.
- Renal calculi.
- Clinical significance of total urine proteins, urine albumin, microalbuminuria, B2 microglobulin, α1microglobulin, retinol binding protein and albumin / creatinine ratio.
- Biosynthesis, metabolism and excretion of nonprotein nitrogenous compounds and clinical and metabolic conditions associated with the increase or the decrease in their blood levels.

- <u>Physiology and disorders of water, electrolytes</u> and acid base metabolism:

- Total body water and electrolyte distribution and their clinical significance.
- Electrolytes and their clinical significance.
- Physiological buffer systems and their role in regulation of blood PH
- Henderson Hasselbalch equation.
- Conditions associated with abnormal acid- base states (Acidosis and alkalosis).
- Blood gases.

- Enzymes:

- Classification, factors affecting their activity.
- Process of enzyme reactions and measuring of reaction rates.
- Optimization and standardization of enzymatic reactions.
- Isoenzymes and isoforms.
- Principles of diagnostic enzymology.
- Hepatobiliary enzymes.
- Cardiac enzymes.
- Pancreatic enzymes.
- Bone enzymes.

- Liver:

- Liver anatomy.
- Clinical manifestation of liver diseases.
- Biochemical functions of the liver.
- Disorders of bilirubin metabolism and types of jaundice.
- Clinical significance of enzyme assay in liver disease.
- 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)
- Diagnostic strategy of liver disease.

- Cardiac markers:

- Tissue distribution of cardiac markers (CK,CKMB, LDH, troponin I, troponin T and myoglobin)
- Clinical utility of cardiac markers in detection of acute myocardial infarction, minor myocardial injury and in monitoring reperfusion following thrombolytic therapy.

- Mineral and bone metabolism:

- Hormonal and integrated control of mineral metabolism.
- Function and clinical significance of minerals in bone metabolism.
- Disorders of mineral metabolism (hypo& hypercalcemia, hypo& hyperphosphtaemia &hypo and hypermagnesemia).
- Metabolic bone diseases (osteoporosis, osteomalacia, Paget's disease and renal osteodystrophy.
- Clinical significance of biochemical markers of bone turnover.

- Gastric, pancreatic and intestinal functions:

- Hormones and enzymes synthesized in gastrointestinal tract as well as their functions and

clinical significance.

- Gastric function tests.
- Tests measure the exocrine function of the pancreas.
- Gastric, pancreatic and intestinal diseases.

- Endocrinology;

- Synthesis, action and regulation of hypothalamic pituitary, adrenal, gonadal, thyroid and parathyroid hormones.
- Clinical significance of hormone derrangement.
- Evaluation of the functional status of each gland (Hormone Stimulation Tests).
- Analytical methodology.

- Errors of amino, organic and fatty acids metabolism

- Basic chemistry Biochemical diagnosis (prenatalnewborn screening and evaluation of symptomatic patients).
- Disorders of amino, organic and fatty acids oxidation metabolism.

- Pregnancy:

- Biochemical changes that take place in pregnancy.
- Proteins and hormones produced by the placenta and their clinical significance.

- Vitamins and trace elements:

- Classification.
- 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

- Synthesis, chemistry and clinical significance of haemoglobin, porphyrins and myoglobin.
- Laboratory data associated with hemoglobinopathies and thalassaemia.

- Clinical chemistry of the geriatrics and

pediatrics.

- Establishing reference intervals for elderly and pediatrics.
- Biochemical and physiological changes of aging.
- Endocrine function changes.
- Renal and hepatic function changes.
- Lipid and enzyme changes.

- Tumour markers:

- Classification of tumour markers.
- Clinical utilities of tumour markers.
- Specific tumer markers (enzymes, hormones, oncofetal antigens,
- B. Describe the etiology, clinical picture, and diagnosis of the following diseases and clinical conditions:

Carbohydrates:

- IDDM. NIDDM.
- Metabolic complications of Diabetes Mellitus
- Hypoglycemia.
- Glycogen storage diseases.
- Lipid chemistry
- Disorders of Lipoprotein metabolism.
- Amino acids and plasma proteins:
- Plasma proteins and disease.
- Benign versus malignant monoclonal gammopathy.
- Disorders of purine metabolism (primary and secondary gout).

- Renal functions and non protein nitrogenous compounds:

- Glomerular and tubular diseases.
- Types of renal failure.
- Renal calculi.
- Clinical significance of total urine proteins, urine albumin, microalbuminuria, B₂ microglobulin, α1microglobulin, retinol binding protein and albumin / creatinine ratio.
- Physiology and disorders of water, electrolytes

and acid base metabolism:

- Electrolytes and their clinical significance.
- Conditions associated with abnormal acid- base states (Acidosis and alkalosis).

- Enzymes:

- Hepatobiliary enzymes.
- Cardiac enzymes.
- Pancreatic enzymes.
- Bone enzymes.

- Liver:

- Clinical manifestation of liver diseases.
- Disorders of bilirubin metabolism and types of jaundice.
- Clinical significance of enzyme assay in liver disease.
- 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)
- Diagnostic strategy of liver disease.

- Cardiac markers:

- Clinical utility of cardiac markers in detection of acute myocardial infarction, minor myocardial injury and in monitoring reperfusion following thrombolytic therapy.

- Gastric, pancreatic and intestinal functions:

- Gastric, pancreatic and intestinal diseases.

- Endocrinology;

- Clinical significance of hormone derrangement.

- <u>Analytes of haemoglobin metabolism and porphyrins</u>

- Synthesis, chemistry and clinical significance of haemoglobin, porphyrins and myoglobin.
- Laboratory data associated with hemoglobinopathies and thalassaemia.
 - C. State update and evidence based Knowledge of

conditioned mentioned in A &B	
D.Explain the facts and principles of the relevant	
basic and clinically supportive sciences related to	
clinical chemistry	
E. Explain the facts and principles of the relevant	
basic and clinically supportive sciences related to	
clinical chemistry	
F. Describe the basic ethical and medicolegal	
principles revenant to the clinical chemistry	
G. Describe the basics of quality assurance to ensure	
good clinical care in clinical chemistry	
H. Explain the ethical and scientific principles of	
medical research	
I. Explain the impact of common health problems in	
the field of clinical chemistry on the society.	

B-Intellectual outcomes

ILOs	Methods of	Methods of
	teaching/	Evaluation
	learning	
A. Design / present case in common problem	seminars,	Checklist Log
related to hematology	tutorial, journal	Book,
related to hematology	club, case	Record
	presentation,	review,
	observation and	Global rating,
	supervision,	Simulations,
	Written and	Portfolios,
	oral	Standardized
	assignments	oral
		examination,
		Written
		examination,
		Procedure
		exam./
		case log
		MD students

	will formally reviewed formative assessment log book	be
B. Apply the basic and clinically supportive sciences which are appropriate to the hematology related conditions / problem / topics.	log book	
C. Demonstrate an investigatory and analytic thinking "problem – solving "approaches to clinical situation related to clinical chemistry		
D. Plan research projects.		
E. Write scientific papers.		
F. Lead risk management activities as a part of clinical governs.		
G. Plan quality improvement activities in the field of medical education and clinical practice in clinical chemistry.		
H. Create / innovate plans, systems, and other issues for improvement of performance in his practice.		
I. Present and defend his / her data in front of a panel of experts		
J. Formulate management plans and alternative decisions in different situations in the field of clinical chemistry		

C-Practical skills (Patient Care)

ILOs	Methods of	Methods of
	learning	Evaluation
A- Take clinical data related to clinical chemistry mentioned in A.A. B. to interpretate the finding of diagnostic procedure related to clinical chemistry A] Laboratory principles: 1) 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. 2) Specimen collection and other preanalytical	teaching/	Checklist Log Book, Record review, Global rating, Simulations, Portfolios, Standardized oral examination, Written examination, Procedure exam./ case log MD students
 variables. [B] Analytical techniques and instrumentation: 1) Spectrophotometeric techniques: 		will be formally reviewed formative assessment log book
 Spectrophotometeric techniques: Basic principles of radioactivity and its measurements. 		UUUK
 3) Electrochemistry: Potentiometry. Amperometry. Coulometry. Conductometry. Biosensors. 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.

[C] <u>Laboratory operations.</u>

- Statistical concepts.
- Reference intervals.
- Method selection and evaluation.
- Quality assurance and quality control.
- Proficiency testing and laboratory accreditation.

D] Analytes:

1- Carbohydrates:

- Perform glucose tolerance test.
- Glycated haemoglobin and fructoseamine measurement.
- Detection of ketone bodies.
- Microalbumin measurement.
- Islet autoantibodies and insulin testing.

2- Lipids and lipoproteins

Analytical assays of lipids, lipoproteins and apolipoproteins.

3- Proteins:

- Analytical methods for determination of total protein, albumin and protein fractionation.
- Serum protein electrophoresis and immunofixation and describe the migration pattern of plasma proteins in health and disease.

4- Renal functions:

- Analytical methods, principles and procedures and other related parameters of kidney functions (urea, creatinine, uric acid and ammonia).
- Physical, chemical and microscopic examination of urine.

5- Liver:

- Volumetric equipments and its calibration.Concept of solvent and solute.
- workshops

- Buffer solution.
- Units of measurement. Safety.
- 2) Specimen collection and other preanalytical variables.

[B] 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, chemiluminescence,

RID and immune electrophoresis.

2) Basic principles of radioactivity and its measurements.

3) Electrochemistry:

- Potentiometry.
- Amperometry.
- Coulometry.
- Conductometry.
- Biosensors.

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.

[C] Laboratory operations.

- Statistical concepts.
- Reference intervals.
- Method selection and evaluation.
- Quality assurance and quality control.
- Proficiency testing and laboratory accreditation.

D] Analytes:

1- Carbohydrates:

- Perform glucose tolerance test.
- Glycated haemoglobin and fructoseamine measurement.
- Detection of ketone bodies.
- Microalbumin measurement.
- Islet autoantibodies and insulin testing.

2- Lipids and lipoproteins

1. Analytical assays of lipids, lipoproteins and apolipoproteins.

3- Proteins:

- Analytical methods for determination of total protein, albumin and protein fractionation.
- Serum protein electrophoresis and immunofixation and describe the migration pattern of plasma proteins in health and disease.

4- Renal functions:

- Analytical methods, principles and procedures and other related parameters of kidney functions (urea, creatinine, uric acid and ammonia).
- 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.

7- Mineral and bone metabolism:

Analytical assays of calcium, phosphorus and

		Γ
magnesium.		
8- Physiology and disorders of water,		
electrolytes and acid base metabolism:		
- Analytical techniques used to determine		
electrolyte concentrations.		
- Operating blood gas analyzers.		
9- Endocrinology:		
Analytical assays of different hormones.		
10- Pregnancy:		
- Measurement of chorionic gonadotrophin and		
its subunits.		
- α Fetoprotein and amniotic fluid bilirubin and		
its subunits.		
11- Body fluid analysis:		
Physical, chemical and microscopic		
examination of these fluids.		
12- Analytes of haemoglobin metabolism and		
porphyrins:		
- To be able to differentiate between		
haemoglobinuria and myoglobinuria.		
- Analysis of porphyrin precursors (PBG, ALA)		
	Clinical round	Procedure
D. Interpret the following non invasive &	with senior	presentation
invasive diagnostic procedures mentioned in	staff	- Log book
C.B	Stair	
E. Perform the following non invasive		Procedure
diagnostic procedures For	Clinical round	-
*Disorders of carbohydrate metabolism.	with senior	- Log book
*Disorders of lipid metabolism.	staff	- Chick list
* Disorders of protein metabolism.	-Perform	
* Disorders of renal function metabolism.	under	
* Disorders of liver function.	supervision of	
* Disorders of cardiac function.	senior staff	
* Disorders of mineral and bone metabolism.		
* Disorders of mineral and bone metabolism. * Disorders of gastric, pancreatic and		
intestinal function.		
*Disorders of water and electrolytes and acid		
Districts of water and electrolytes and actu		

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. * Disorders of body fluid analysis.	
*Disorders of hemoglobin metabolism and porphyrins. *Clinical chemistry of geriatrics and pediatrics. *Tumor markers and its clinical applications.	
F. Develop patient management plans for the problems in clinical chemistry	
G. Counsel and educate patients and their family about the condition mentioned in A.B	
H. Use information technology to support patient care decisions and patient education for clinical chemistry related conditions.	
I. Provide health care services aimed at preventing the following conditions Related to clinical chemistry.	
J. Work with health care professionals, including those from other disciplines, to provide patient-focused care about the condition mentioned in B.A	
K. 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 in the common problems (plain and conduct audit cycles)	Journal club, case presentation, observation and supervision, Written and oral assignments, Conference	Procedure/case presentation -Log book and Portfolios
B. Locate, appraises, and assimilates evidence from scientific studies related to patients' health problems.	Journal clubs Discus sions in seminars and clinical rounds	
C. Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness		
D. Use information technology to manage information, access on-line medical information; and support their own education		
E. Lead the learning of students and other health care professionals.		

Interpersonal and Communication Skills

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Professionalism

ILOs	Methods of teaching/	Methods of Evaluation
	Learning	Z varaution
J. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest.	Lectures, seminars, case presentation, observation and supervision, Written and oral assignments, Conference	1. Objective structured clinical examination 2. Patient survey
K. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.		1. 360o global rating
L. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

Systems-Basea I factice				
ILOs	Methods of	Methods of		
	teaching	Evaluation		
	learning			
M. Work effectively in different health care delivery settings and systems related to the module.	Lectures, seminars, observation and supervision, Written and oral assignments, Conference	1. 360o global rating		
N. Practice cost-effective health care and resource allocation that does not compromise quality of care in this	Comerence	1. Check list evaluation of live or recorded		

module	performance
O. Advocate for quality patient care and assist patients in dealing with system complexities	 360o global rating Patient survey
P. Partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance	

COURSE 7; Module 3- Immunology

A-Knowledge and understanding

ILOs		Methods of
0 2	teaching/	Evaluation
	learning	
A- Illustrate the detailed of the following:	Lectures,	Checklist
1-Cells, tissues and organs of immune system	seminars,	Log Book,
2-Anatomy and function of lymphoid tissue.	tutorial,	Record
- bone marrow	journal club,	review,
- thymus	case	Global
- lymph node	presentation,	rating,
- spleen	observation	Simulations,
- mucosal immune system	and	Portfolios,
3- Mechanism and Pathways of lymphocytes	supervision,	Standardized
recirculation and homing.	Written and	oral
- Recirculation of Natïve T lymphocytes	oral	examination,
- Migration of effector T lymphocytes	assignments	Written
- Memory T cell Migration		examination,
- Homing of B Lymphocytes		Procedure
4-Antigen		exam./
- Feature of Biologic antigen		case log
- Structure and chemical basis of antigen binding		MD students
-Antigen recognition		will be
5- Innate Immunity		formally
- Feature of innate immunity		reviewed
- Epithelial barrier		formative
- Phagocytes and inflammatory responses		assessment
- cells of innate immunity		log book
- Circulating pattern recognition molecules and		
effector protein		
- Cytokines of innate immunity		
- Cytokine storm		
- Role of innate immunity in stimulating adaptive		
immunity		
-Adhesions Molecules		
6- Complement:		
- Pathways of complement activation		

- Receptors of complement
- Regulation of complement
- Function of complement
- Evasion of complement by microbes
- Complement deficiency
- 7- Antigen Presenting Cells and antigen presentation
- Antigen Presenting Cells
- -Role in immune response
- Antigen processing and Presentation to T lymphocytes
- MHC class I associate with endogenous peptide
- MHC class II associate with exogenous peptide
- 8- Adaptive Immunity
 - -Subset of Lymphocytes
 - T- Lymphocytes
 - Development of lymphocytes morphology and maturation
 - -T cell receptor
- Signal transduction by TCR
- CD 4 T lymphocytes
- Activation of CD4 Lymphocytes
- CD8 T lymphocytes
- Frequency and responsive to particular antigen.
- Effector function.
 - Surface protein expression
- B- lymphocytes
 - Development of lymphocytes, morphology and maturation
- 9- Immunoglobulin

isotype

- -Affinity of immunoglobulin production Effector Function
- 8-Natural killer cells
 - -Identification.
 - -Development
 - -functions
- 9-Antibodies (Immunoglobulin)

- Structure
- Types
- Immunoglobulin gene rearrangement
- -Function
- Immune response
- 10-Cytokines
 - -General properties
- -Cytokines mediate and regulate innate Immunity.
- -Cytokines mediate and regulate adaptive immunity.
 - -Cytokine stimulates Hematopoiesis.
- 11- The major histocompatibility complex
 - -Structure of MHC molecule
- -Binding of peptide to MHC molecule
- -Genomic organization of MHC molecules

12-Apoptosis

- Difference between apoptosis and necrosis
 - Pathways of apoptosis
- Inducer of apoptosis
- Inhibitors of apoptosis
- **B-Clinical Immunology**
- 1-Hypersensitivity Types
- -type I immediate hypersensitivity
- type II antibody mediated hypersensitivity
- type III immune complex mediated

Hypersensitivity

- type IV cell mediated hypersensitivity
- 2- Immunological Tolerance
- T lymphocytes tolerance
- B lymphocytes tolerance
- Tolerance induced by foreign protein antigen
- 3- Immune response to viral,
 - Bacterial, fungal and parasitic infections.

4-Primary immunodeficiency diseases

- T-cell
- B-cell
- combined
- complement
- phagocytes
- 5- Acquired immunodeficiency diseases
 - (Human immunodeficiency Virus)
 - Molecular and biologic features
 - Pathogenesis
 - Clinical features
 - Immune response
 - Diagnosis
 - treatment and prevention
- 6- Virus of the immune system

COVID 19

- 7- Rheumatic Diseases
 - -Systemic lupus erythematosus
 - -Rheumatoid arthritis
 - -Ankylosing spondoylitis
 - SjÖgren,s syndrome
 - Systemic sclerosis
- 8-Endocrine Diseases
 - -Type 1 (Insulin-dependant)

Diabetes mellitus

- -Autoimmune thyroid disease
- 9- Liver Diseases
 - -autoimmune hepatitis.
 - -Primary biliary cirrhosis.
 - -Viral Hepatitis
 - -Drug –induced hepatitis.

- -Autoimmune sclerosing Cholangitis 10- Renal Diseases. - Antibody mediated nephritis - Glomerulonephritis associated with immune complex - Renal disease associated with vasculitis 11-Hematological diseases. -Autoimmune hemolytic anemia -Drug induce hemolysis - autoimmune disease of the blood -Neoplastic disease of B Imphocytes -Immunophenotyping 12-Reproduction and immune system 13- Tumour immunology 14-Clinical Transplantation 15- Immunologic therapy -immunization
 - Allergy and desensitization
 - -immune suppressive
 - immunomodulators
 - Anti-inflammatory drugs
 - Vaccination

C-Immunological Laboratory

- 1. Principles and methodology of:
- -Detection of antigens and antibodies
- -Methods of cell mediated immunity
- -Histocompatibility test
- -Laboratory evaluation of immune competence.
- -Molecular genetic techniques of clinical analysis of

immune system.	
2. Test-performance characteristics: principles of sensitivity, specificity, predictive value, and ROC analysis	
3-Quality assurance	
4-Laboratory safety	
5-Laboratory management	
B. Describe the etiology, clinical picture, and diagnosis of the following diseases and clinical conditions related to 1-Hypersensitivity Types	
 -type I immediate hypersensitivity - type II antibody mediated hypersensitivity - type III immune complex mediated Hypersensitivity - type IV cell mediated hypersensitivity 2-Primary immunodeficiency diseases - T-cell - B-cell - combined - complement - phagocytes 3- Acquired immunodeficiency diseases 	
(Human immunodeficiency Virus)	
 Molecular and biologic features Pathogenesis Clinical features Immune response Diagnosis treatment and prevention 	
4- Virus of the immune system	
5- Rheumatic Diseases	
-Systemic lupus erythematosus	

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-Rheumatoid arthritis	
-Ankylosing spondoylitis	
- SjÖgren's syndrome	
- Systemic sclerosis	
6-Endocrine Diseases	
-Type 1 (Insulin-dependant)	
Diabetes mellitus	
-Autoimmune thyroid disease	
7- Liver Diseases	
-autoimmune hepatitis.	
-Primary biliary cirrhosis.	
-Viral Hepatitis	
-Drug –induced hepatitis.	
-Autoimmune sclerosing Cholangitis	
8- Renal Diseases.	
- Antibody mediated nephritis	
- Glomerulonephritis associated with immune complex	
- Renal disease associated with vasculitis	
9-Hematological diseases.	
-Autoimmune hemolytic anemia	
-Drug induce hemolysis	
- autoimmune disease of the blood	
-Neoplastic disease of B Imphocytes	
-Immunophenotyping	
10-Clinical Transplantation	
C. State update and evidence based Knowledge of	
conditioned mentioned in A &B	
D. Explain the facts and principles of the relevant	

basic and clinically supportive sciences related to	
immunology	
E. Explain the facts and principles of the relevant	
basic and clinically supportive sciences related to	
Hematology	
F.Describe the basic ethical and medicolegal	
principles revenant to the immunology.	
F. Describe the basics of quality assurance to ensure	
good clinical care in immunology.	
H. Explain the ethical and scientific principles of	
medical research	
I. Explain the impact of common health problems in	
the field of hematology on the society.	

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Design / present case in common problem related to immunology B. Apply the basic and clinically supportive sciences which are appropriate to the hematology related conditions / problem / topics. C. Demonstrate an investigatory and analytic thinking "problem – solving "approaches to clinical situation related to immunology D. Plan research projects. E. Write scientific papers. F. Lead risk management activities as a part of clinical governs.	seminars, tutorial, journal club, case presentation, observation and supervision, Written and oral assignments	Record review, Global rating, Simulations, Portfolios,

G. Plain quality improvement activities in	will be formally
the field of medical education and clinical	reviewed
practice in hematology.	formative
	assessment log
	book
H. Create / innovate plans, systems, and	
other issues for improvement of	
performance in his practice.	
I. Present and defend his / her data in front	
of a panel of experts	
J. Formulate management plans and	
alternative decisions in different situations	
in the field of immunology	

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ Learning	Methods of Evaluation
A.Take history, examine and clinically diagnose different conditions related to immunology	-Clinical rounds -Seminars -Clinical rotations (service teaching)	Checklist Log Book, Record review, Global rating, Simulations, Portfolios, Standardized oral examination, Written examination, Procedure exam./ case log MD students will be formally reviewed formative assessment log book

B.Recommend the following non invasive/invasive diagnostic procedures - Screening test for hypersensitivity and detection of different allergens Tissue typing Phagocytic function Cytogenetic analysis Real time PCR and its applications Advanced molecular techniques.	Clinical round with senior staff Observation Post graduate teaching Hand on workshops	Procedure presentation - Log book - Chick list
 C. Interpret the following non invasive/invasive diagnostic procedures Screening test for hypersensitivity and detection of different allergens. Tissue typing. Phagocytic function. Cytogenetic analysis. Quantitative PCR Real time PCR and its applications. Advanced molecular techniques. 	Clinical round with senior staff	Procedure presentation - Log book
D.Perform the following non invasive/invasive diagnostic procedure -Serological tests: Widal test. Malta test. RF. ASOT. CRPVirological tests by AxSym *Hepatitis markers Anti-HIV - Anti-HCV -HBsAg - Anti-HBsAg (AUSAB) - HBeAg - Anti-HBeAg - Anti-CIgM	Clinical round with senior staff -Perform under supervision of senior staff	Procedure presentation - Log book - Chick list

- 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.- Quantitative PCR		
E. Prescribe the following non invasive	Clinical round	
therapeutic procedures mentioned C. A,B &C	with senior staff	presentationLog bookChick list
F.Develop patient management plans for the following problems in clinical immunology		
G.Counsel and educate patients and their family about the condition mentioned in A. A & A.B		
H.Use information technology to support patient care decisions and patient education for clinical immunology		

related conditions.	
I.Provide health care services aimed at preventing the following conditions related to immunological diseases	
j.Work with health care professionals, including those from other disciplines, to provide patient-focused care about the condition mentioned in A. A & A.B	
k.Write competently all forms of professional reports related to the Immunology (lab reports)	

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/	Methods of Evaluation
	learning	
A. Perform practice-based improvement activities using a systematic methodology in the common problems (plain and conduct audit cycles)	Journal club, case presentation, observation and supervision, Written and oral assignments, Conference	Procedure/case presentation -Log book and Portfolios
B. Locate, appraises, and assimilates evidence from scientific studies related to patients' health problems.	Journal clubs Discussions in seminars and clinical rounds	
C. Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness		
D. Use information technology to manage information, access on-line medical information; and support their own education		
E .Lead the learning of students and other health care professionals.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/	Methods of Evaluation
F. Create and sustain a therapeutic and ethically sound relationship with patients	learning Lectures, seminars, case presentation, observation and supervision, Written and oral assignments,	Checklist Log Book, Record review, Global rating, Simulations, Portfolios, Standardized oral
G. Perform the following oral communications and interpretation of results of different investigation related to the mentioned conditions	Conference	examination
H. Fill the following reports: hematological report related to the mentioned conditions		
I.Work effectively with others as a member or leader of a health care team e.g. in labor ward		

Professionalism

ILOs	Methods of teaching/ Learning	Methods of Evaluation
J. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society that supersedes self-interest.	Lectures, seminars, case presentation, observation and supervision, Written and oral assignments, Conference	1. Objective structured clinical examination 2. Patient survey
K. Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.		1. 360o global rating
L. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

Systems-based Practice		
ILOs	Methods of	Methods of
	teaching	Evaluation
	learning	
M. Work effectively in different health care delivery settings and systems related to the module.	Lectures, seminars, observation and supervision, Written and oral assignments,	- 360o global rating
N. Practice cost-effective health care and	Conference	-Check list
11. I factice cost-effective health care and		

resource allocation that does not compromise	evaluation of live or
quality of care in this module	recorded
	performance
O. Advocate for quality patient care and assist patients in dealing with system complexities	- 360o global rating - Patient survey
P.Partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance	

Course 7; Module 4- Microbiology

A-Knowledge and understanding

ILOs	Methods of	Methods of
	teaching/	Evaluation
	learning	
A- outline the detailed of the following:	Lectures,	Record
Conoral microbiology	LAB.	review,
General microbiology:	seminars,	Global
-Important normal flora.	tutorial,	rating,
-Major pathogenicity mechanisms	journal club,	Simulations,
-Bacterial virulence	case	Portfolios,
- Bacterial genetics	presentation,	Standardized
-Specimens collection	Conference, Written and	oral examination,
-Specimen transport	oral	Written
	assignments,	examination,
-Specimen receipt & preliminary observation	lab	Procedure
-Microscopic examination	experiments	exam./
-Processing of cultures		case log
-Laboratory Safety		log book
- bacterial Vaccines		
-Sterilization & disinfection		
2- Basic Virology:		
-Structure		
-Classification of medically important viruses		
-Laboratory diagnosis of viral infection		
3- Basic Mycology:		
-Structure		
-Classification of medically important fungus		
-Laboratory diagnosis of fungal infection		
4- Laboratory strategy in diagnosis of bacterial		
infections.		
- Medically important bacteria :		

-Gram positive cocci:

- Staphylococcus aurous
- Coagulase negative Staphylococcus
- Micrococcus
- Streptococci

-Gram negative cocci

- Neisseria
- Moraxella

-Gram positive rods:

- * Non spore forming
- o Corynbacterium diphtheria
- Actinomycetes
- Listeria monocytogenes
- o Lactobacillus
- **Spore forming:**
- o Bacillus cereus
- Bacillus anthraces
- Clostridium tetani
- o Clostridium botulinum
- o Clostridium difficile
- Clostridium perfeingens

-Gram negative rods:

- o Bordetella
- o Brucella species
- o Haemophilus
- o HACEK
- o Pseudomonas
- Acinetobacter
- o Pasteuella
- o Leginoella
- o Francisella
- Vibro species
- Compylobacter and Helicobacter
- Enterobacteriaceae (Escherichieae, Klebsielleae Proteus, Salmonella, Shigella, Citrobacter and Yersiniea)
- Bacteroides

-Spirochaetes:	
Treponema species	
o Borrelia	
Leptospira	
_Poorly gram staining organisms:	
Mycobacteria	
Rickettsias	
o Chlamydia	
o Mycoplasma	
-Important fungal infections:	
 Superficical infections (keratinized 	
tissue)	
 Cutaneous fungal infections (Yeast & 	
dermatophytes)	
 Subcutaneous mycoses 	
 Deep fungal infections 	
Important viral infections:	
 Viral hepatitis 	
 DNA viral diseases 	
 RNA viral diseases 	
 Oncogenic viruses 	
-Antimicrobial chemotherapy:	
 Methods & interpretations 	
 Antibiotic groups & drug resistant 	
-Technologic advances in clinical microbiology	
- Immunologic methods in clinical microbiology	
-Molecular methods in clinical microbiology	
-Sterilization techniques	
-Nosocomial infection	
-Biological terrorism	
-Clinical infection diseases	
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	
-spirochaetes	
-Poorly gram staining organisms	
-Important fungal infections	
- Viral infection	
- Fungal infection	
C. State update and evidence based Knowledge of	
conditioned mentioned in A &B	
D. Explain the facts and principles of the relevant	
basic and clinically supportive sciences related to	
microbiology.	
E. Explain the facts and principles of the relevant	
basic and clinically supportive sciences related to	
microbiology	
F.Describe the basic ethical and medicolegal	
principles revenant to the microbiology.	
G.Describe the basics of quality assurance to ensure	
good clinical care microbiology.	
H. Explain the ethical and scientific principles of	
medical research	
I. Explain the impact of common health problems in	
the field of hematology on the society.	

B-Intellectual outcomes

ILOs	Methods of	Methods of
	teaching/	Evaluation
	learning	
A. Design / present case in common problem	seminars,	Checklist Log
related to microbiology.	tutorial, journal	Book,
Telated to interoclory.	club, case	Record
	presentation,	review,
	observation	Global rating,
	and	Simulations,
	supervision,	Portfolios,
	Written and	Standardized
	oral	oral

	assignments	examination, Written examination, Procedure exam. / case log MD students will be formally reviewed formative assessment log book
B. Apply the basic and clinically supportive sciences which are appropriate to the hematology related conditions / problem / topics.		
C.Demonstrate an investigatory and analytic thinking "problem – solving "approaches to clinical situation related to microbiology. D. Plan research projects.		
E. Write scientific papers.		
F.Lead risk management activities as a part of clinical govern.		
G.Plain quality improvement activities in the field of medical education and clinical practice in microbiology		
H.Create / innovate plans, systems, and other issues for improvement of performance in his practice.		
I.Present and defend his / her data in front of a panel of experts		
J. Formulate management plans and alternative decisions in different situations in the field of microbiology		

C-Practical skills (Patient Care)

C-1 l'actical skills (1 aut		3.6.41 1 0
ILOs	Methods of	Methods of
	teaching/	Evaluation
	learning	
A. Take history, examine and clinically	SEMINARS,	Checklist
diagnose different conditions related to	JOURNAL	Log Book,
microbiology.	CLUB,	Record
11110100101085	Service	review,
	teaching,	Global
		rating,
		Simulations,
		Portfolios,
		Standardized
		oral
		examination,
		Written
		examination,
		Procedure
		exam./
		case log
		MD students
		will be
		formally
		reviewed
		formative
		assessment
		log book
B. Recommend the following non invasive/		Procedure
diagnostic procedures	Clinical	presentation
1. Sampling and Specimens collection:	round with	- Log book
Blood, Urine, Pus, Sputum, Stool and	senior staff	- Chick list
biological fluid	Observation	
Techniques	Post graduate	
- Precautions	teaching	
- Containers	Hand on	
2- Transportation and Processing of	workshops	
Specimens:		
-	1	1

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

Novy mothoday DCD		
-New methods: PCR		
-Advanced Techniques :		
-PCR -PCR- RFLP		
- Automation in Microbiology :		
VITEK2		
BACT/ALERT	Clinical	Procedure
C. Interpret the following non invasive	Clinical	
diagnostic procedures mentioned in C.B	round with	presentation
	senior staff	- Log book
D. Perform the following non	Clinical	Procedure
invasive/invasive diagnostic procedures	round with	presentation
mentioned in C.B	senior staff	- Log book
	-Perform	- Chick list
	under 	
	supervision	
	of senior	
	staff	D 1
E. Prescribe the following non	Clinical	Procedure
invasive/invasive therapeutic procedures.	round with	presentation
	senior staff	- Log book
		- Chick list
F. Develop patient management plans for the		
following problems in microbiology		
G. Counsel and educate patients and their		
family about the condition mentioned in		
B.A		
H. Use information technology to support		
patient care decisions and patient education		
for microbiology related conditions.		
I. Provide health care services aimed at		
preventing the following conditions		
Related to infectious diseases		
I Work with health care much a street		
J. Work with health care professionals,		
including those from other disciplines, to		

provide patient-focused care about the condition mentioned in A.B	
K. Write competently all forms of professional reports related to the Microbiology (lab reports)	

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of	Methods of
	teaching/	Evaluation
	learning	
A . Perform practice-based improvement	Journal club, case	Procedure/case
activities using a systematic	presentation,	presentation
methodology in the common problems	observation and	-Log book and
(plain and conduct audit cycles)	supervision,	Portfolios
	Written and oral	
	assignments,	
	Conference	
B. Locate, appraises, and assimilates	Journal clubs	
evidence from scientific studies related	Discussions	
to patients' health problems.	in seminars and	
	clinical rounds	
C. Apply knowledge of study designs		
and statistical methods to the appraisal of		
clinical studies and other information on		
diagnostic and therapeutic effectiveness		
D. Use information technology to		
manage information, access on-line		
medical information; and support their		
own education		
E. Lead the learning of students and		
other health care professionals.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Create and sustain a therapeutic and ethically sound relationship with patients	Lectures, seminars, case presentation, observation and	Checklist Log Book, Record review, Global rating,
G.Perform the following oral communications and interpretation of results of different investigation related to the mentioned conditions	supervision, Written and oral assignments, Conference	Simulations, Portfolios, Standardized oral examination
H. Fill the following reports: hematological report related to the mentioned conditions		
I. Work effectively with others as a member or leader of a health care team e.g. in labor ward		

Professionalism

ILOs	Methods of	Methods of
	teaching/	Evaluation
	Learning	
J.Demonstrate respect, compassion, and integrity;	Lectures,	1. Objective
a responsiveness to the needs of patients and	seminars,	structured
society that supersedes self-interest.	case	clinical
society that superseces sen interest.	presentation,	examination
	observation	2. Patient
	and	survey
	supervision,	
	Written and	
	oral	
	assignments,	
	Conference	

k.Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices.	1. 360o global rating
L. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities	

Systems-Based Practice

ILOs	Methods of	Methods of
55	teaching/	Evaluation
	learning	
M. Work effectively in different health care delivery settings and systems related to the module.	Lectures, seminars, observation and supervision, Written and	- 360o global rating
N. Practice cost-effective health care and resource allocation that does not compromise quality of care in this module	oral assignments, Conference	- Check list evaluation of live or recorded performance
O. Advocate for quality patient care and assist patients in dealing with system complexities		- 360o global rating
P. Partner with health care managers and health care providers to assess, coordinate, and improve health care and predict how these activities can affect system performance		- Patient survey

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

Time Schedule: Second part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skill	General Skills
N	Module 1- He	matology		
Normal hematologic system	А,С-Е	B,E,G-J	-	С-Е
Disorders of red cells	A-I	A-J	A-L	A-P
Non malignant disorders of leukocytes and the spleen	A-I	A-J	A-L	A-P
Hematologic malignancies	A-I	A-J	A-L	A-P
Disorders of hemostasis	A-I	A-J	A-L	A-P
Transfusion medicine	A-I	A-J	A-L	A-P
Laboratory hematology and diagnostic approach to	A-I	A-J	A-L	A-P
Miscellaneous	A-I	A-J	A-L	A-P
Mod	ule 2- Clinica	al Chemistry		
Carbohydrates	A-I	A-J	A-K	A-P
Lipid chemistry	A-I	A-J	A-K	A-P
Amino acids and plasma proteins	A-I	A-J	A-K	A-P
Renal functions and non protein nitrogenous compounds	A-I	A-J	A-K	A-P
Physiology and disorders of water, electrolytes and acid base metabolism	A-I	A-J	A-K	A-P
Enzymes	A-I	A-J	A-K	A-P
Liver	A-I	A-J	A-K	A-P
Cardiac markers	A-I	A-J	A-K	A-P
Mineral and bone metabolism	A-I	A-J	A-K	A-P
Gastric, pancreatic and	A-I	A-J	A-K	A-P

intestinal functions				
Endocrinology	A-I	A-J	A-K	A-P
Errors of amino, organic and	A-I	A-J	A-K	A-P
fatty acids metabolism				
Pregnancy	A-I	A-J	A-K	A-P
Vitamins and trace elements	A-I	A-J	A-K	A-P
Body fluid analysis	A-I	A-J	A-K	A-P
Analytes of haemoglobin	A-I	A-J	A-K	A-P
metabolism and porphyrins				
Clinical chemistry of the	A-I	A-J	A-K	A-P
geriatrics and pediatrics				
Tumour markers	A-I	A-J	A-K	A-P
N	Module 3- Im	munology		
Cells, tissues and organs of	A,C-E	B,E,G-I	-	С-Е
_				
Anatomy and function of	A,C-E	B,E,G-I	-	С-Е
lymphoid tissue.				
Mechanism and Pathways of	A,C-E	B,E,G-I	-	С-Е
lymphocytes recirculation				
and homing				
Antigen	A,C-E	B,E,G-I		С-Е
Innate Immunity	A,C-E	B,E,G-I	-	С-Е
Complement	A,C-E	B,E,G-I	-	C-E
Antigen Presenting Cells and	A,C-E	B,E,G-I	-	С-Е
antigen presentation				
Adaptive Immunity	A,C-E	B,E,G-I	-	C-E
Immunoglobulin	A,C-E	B,E,G-I	-	C-E
Natural killer cells	A,C-E	B,E,G-I	-	C-E
Cytokines	A,C-E	B,E,G-I	-	C-E
The major histocompatibility	A,C-E	B,E,G-I	-	С-Е
complex				
Apoptosis	A,C-E	B,E,G-I	-	C-E
Clinical Immunology	A-I	A-J	A-K	A-P
Immunological Tolerance	A-I	A-J	A-K	A-P
Immune response to viral	A-I	A-J	A-K	A-P

Primary immunodeficiency	A-I	A-J	A-K	A-P
diseases	A T	Α.Τ.	A 17	A D
Acquired immunodeficiency	A-I	A-J	A-K	A-P
diseases	Α.Τ.	Α Τ	A 17	A D
Virus of the immune system	A-I	A-J	A-K	A-P
Rheumatic Diseases	A-I	A-J	A-K	A-P
Endocrine Diseases	A-I	A-J	A-K	A-P
Liver Diseases	A-I	A-J	A-K	A-P
Renal Diseases.	A-I	A-J	A-K	A-P
Hematological diseases	A-I	A-J	A-K	A-P
Reproduction and immune	A-I	A-J	A-K	A-P
system				
T	A T	Α.Τ.	A 17	A D
Tumour immunology	A-I	A-J	A-K	A-P
Immunologic therapy	A-I	A-J	A-K	A-P
Module	4- Microbio	logy		
General microbiology	A,C-E	B,E,G-I	-	С-Е
Basic Virology	A,C-E	B,E,G-I	-	С-Е
Basic Mycology	A,C-E	B,E,G-I	-	С-Е
Laboratory strategy in	A-I	A-J	A-K	A-P
diagnosis of bacterial				
infections				
Gram positive cocci	A-I	A-J	A-K	A-P
Gram negative cocci	A-I	A-J	A-K	A-P
Gram positive rods	A-I	A-J	A-K	A-P
Gram negative rods	A-I	A-J	A-K	A-P
Spirochaetes	A-I	A-J	A-K	A-P
Poorly gram staining	A-I	A-J	A-K	A-P
organisms				
Important fungal infections	A-I	A-J	A-K	A-P
Important viral infections	A-I	A-J	A-K	A-P
Antimicrobial chemotherapy	A-I	A-J	A-K	A-P
Technologic advances in	A-I	A-J	A-K	A-P
clinical microbiology				

Immunologic methods in	A-I	A-J	A-K	A-P
clinical microbiology				
Molecular methods in clinical	A-I	A-J	A-K	A-P
microbiology				
Sterilization techniques	A-I	A-J	A-K	A-P
Nosocomial infection	A-I	A-J	A-K	A-P
Biological terrorism	A-I	A-J	A-K	A-P
Clinical infection diseases	A-I	A-J	A-K	A-P

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
- 8. observation and supervision,
- 9. Written and oral assignments

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
- 8. observation and supervision,
- 9. Written and oral assignments

7. Course assessment methods:

i. Assessment tools:

- Clinical examination
- Written and oral examination
- Chick list
- ➤ log book & portfolio

- ➤ Procedure/case presentation
- ➤ One MCQ examination in f the second year and one in the third year
- ➤ Objective structured clinical examination
- > Check list evaluation of live or recorded performance
- ➤ Patient survey
- ➤ 360o global rating
- ii. Time schedule second part as specified in logbook.
- iii. Marks: 1200 marks (600 for written+240 for oral+360 for practical)

If it is main module in subspeciality, it represent ;70 % of course marks: and the remaining modules are Subsidiary module s representing 30% of total course marks as (10%) for each.

8. List of references

Hematology:

i. Lectures notes

Staff members print out of lectures and/or CD copies

ii. Essential books

Hematology

- 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 "

iii. Recommended books

- -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.
- 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

Iv. Periodicals, Web sites, ... etc

- American journal of hematology
- Journal of hematology oncology
- Journal of thrombosis and hemostasis
- Blood
- Hematologica

v. Others

None

Clinical Chemistry:

i. Lectures notes

Staff members print out of lectures and/or CD copies

ii. Essential books

- Tietz Fundamentals of Clinical Chemistry and Molecular 1 Diagnostics 8th Edition - June 22, 2018.

Contemporary Practice in Clinical Chemistry Fourth Edition 2020.

iii. Recommended books

Clinical Chemistry: Principles, Techniques and Correlations - 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 \mid Oct 5, 2006
- 3- Marshall Clinical chemistry.By William J. Marshall, Márta Lapsley, Andrew Day, Kate Shipman,9th edition,2021.
- 4- SBAs and EMQs in CLINICAL PATHOLOGY, By Sukhpreet Dubb, Neeral Patel, Nishma Manek, Dhruv Panchal, Shams Shamoon, 2013.

iv. Periodicals, Web sites, ... etc

- Journal of Clinical Chemistry
- Molecular and cellular endocrinology
- Atherosclerosis

Immunology:

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

Microbiology:

. 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

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:	Head of the Department:
Prof Dr / Aml Abdel Aal.	Prof Dr / Azza Mahmoud Ezz El
	Din
Date:	Date:

ANNEX 2 Program Academic Reference Standards (ARS)

1- Graduate attributes for medical doctorate in Clinical pathology

The Graduate (after residence training and medical doctorate years of study) must:

- **1-** Demonstrate competency and mastery of basics, methods and tools of scientific research and clinical audit in Clinical pathology
- **2-** Have continuous ability to add knowledge to Clinical pathology through research and publication.
- **3-** Appraise and utilise relevant scientific knowledge to continuously update and improve clinical practice.
- **4-** Acquire excellent level of medical knowledge in the basic biomedical, behavioural and clinical sciences, medical ethics and medical jurisprudence and apply such knowledge in patient care and scientific research.
- **5-** Function as a leader of a team to provide patient care that is appropriate, effective and compassionate for dealing with health problems and health promotion.
- **6-** Identify and create solutions for health problems in Clinical pathology.
- **7-** Acquire an in depth understanding of common areas of Clinical pathology, from basic clinical care to evidence based clinical application, and possession of required skills to manage independently all problems in these areas.
- 8- Demonstrate leadership competencies including 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.
- **9-** Function as teacher in relation to colleagues, medical students and other health professions.
- **10-** Master decision making capabilities in different situations related to Clinical pathology.
- 11- Show leadership 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.
- **12-** Demonstrate in depth awareness of public health and health policy issues including independent ability to improve health care, and identify and carryout systembased improvement of care.
- 13- Show model attitudes and professionalism.
- **14-** Demonstrate commitment for lifelong learning and maintenance of competence and ability for continuous medical education and learning in subsequent stages and in Clinical pathology or one of its subspecialties.
- **15-** Use recent technologies to improve his practice in Clinical pathology.
- **16-** Share in updating and improving clinical practice in Clinical pathology.

2- Competency based Standards for medical doctorate in Clinical pathology

22.1- Knowledge and understanding

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

- **2-1-A-** Established, updated and evidence- based theories, basics and developments of Clinical pathology and relevant sciences.
- **2-1-B-** Basics, methods and ethics of medical research.
- **2-1-C-** Ethical and medicolegal principles of medical practice related to Clinical pathology.
- **2-1-D-** Principles and measurements of quality in Clinical pathology.
- **2-1-E-** Principles and efforts for maintainace and improvements of public health.

2- Intellectual skills

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

- **2-2-A-** Application of basic and other relevant science to solve Clinical pathology related Problems.
- **2-2-B-** Problem solving based on available data.
- **2-2-C-** Involvement in research studies related to Clinical pathology.
- **2-2-D-** Writing scientific papers.
- **2-2-E-** Risk evaluation in the related clinical practice.
- **2-2-F-** Planning for performance improvement in Clinical pathology.
- **2-2-G-** Creation and innovation in Clinical pathology
- **2-2-H-** Evidence based discussion.
- **2-2-I-** Decision making in different situations related to Clinical pathology.

2.3- Clinical skills

By the end of the program, the graduate should be able to Competency-based outcomes for Patient Care:-

- **2-3-A-** MD students must be able to provide extensive level of patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health extensive level means in depth understanding and from basic science to evidence based clinical application and possession of skills to manage independently all problems in Clinical pathology.
- **2-3-B-** Master patient care skills relevant to Clinical pathology for patients with all diagnoses and procedures.
- **2-3-C-** Write and evaluate reports for situations related to the 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-**Master 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 competently all information sources and technology to improve his practice.
- **2-4-**C- Master skills of teaching and evaluating others.
 - Competency-based objectives for Interpersonal and Communication Skills
- **2-4-D-** Master interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals.

- **Lesson** Competency-based objectives for Professionalism
- **2-4-E-**Master Professionalism behavior, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.
 - **Lesson :** 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-** Participate in improvement of the education system.
- **2-4-H-** Demonstrate skills of leading scientific meetings including time management
- **2-4-O-** Demonstrate skills of self and continuous learning.

Annex 3, Methods of teaching/learning

Annex 3, Methods of teaching/learning

	Patient care	Medical knowledg e	based	Interpers onal and communic ation skills	Profession alism	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 MD students.

Method	Practic al skills	K	Intellect ual	General skills			
	Patient care	K	I	Practice- based learning/ Improve ment	onal and communi	Profession alism	Syste ms- based practi ce
Record review	X	X	Х		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	Х	X	X		X
Written examination	X	X	Х	Х			Х
Procedure/ case log	X	X					
OSCE	X	X	X	X	X	X	X

Annex 4, Glossary of MD students 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 MD doctor's patient records in an oral examination to assess clinical decisionmaking.
- ❖ 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 MD doctor's performance on checklists and provide feedback for history taking, physical examination, and communication skills. Physicians may also rate the MD doctor's performance.
- ❖ Objective Structured Clinical Examination (OSCE) A series of stations with standardized tasks for the MD doctors to perform. Standardized patients and other assessment methods often are combined in an OSCE. An observer or the standardized patient may evaluate the MD doctors.
- ❖ Procedure or Case Logs MD 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 MD 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 MD doctors, faculty, nurses, clerks, and other clinical staff evaluate MD doctors from different perspectives using similar rating forms.
- ❖ Portfolios A portfolio is a set of project reports that are prepared by the MD doctors to document projects completed during the MD 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 MD 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 MD doctors.

Annex 5, program evaluation tools

By whom	Method	sample
Quality Assurance	Reports	#1
Unit	Field visits	
External Evaluator	Reports	#2
(s):According to	Field visits	
department council		
External Examiner		
(s): According to		
department council		
Stakeholders	Reports	#5
	Field visits	
	questionnaires	
Senior students	questionnaires	#2
Alumni	questionnaires	#

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

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

1- Graduate attributes

E	NACAAE C
Faculty ARS	NAQAAE General ARS
	for postgraduate
	Programs
1- Demonstrate competency and mastery of	1-إتقان أساسيات و منهجيات البحث العلمي
basics, methods and tools of scientific research	
and clinical audit in Clinical pathology.	
2- Have continuous ability to add knowledge new	2-العمل المستمر علي الإضافة للمعارف في
developments to Clinical pathology through	"
research and publication.	مجال التخصص
3- Appraise and utilise scientific knowledge to	3-تطبيق المنهج التحليلي والناقد للمعارف في
continuously update and improve clinical	
practice and relevant basic sciences.	مجال التخصص و المجالات ذات العلاقة
4- Acquire excellent level of medical	4-دمج المعارف المتخصصة مع المعارف
knowledge in the basic biomedical, clinical,	ذات العلاقة مستنبطا و مطورا للعلاقات
behavioural and clinical sciences, medical	
ethics and medical jurisprudence and apply	البينية بينها
such knowledge in patient care and scientific	
5- Function as a leader of a team to	5-إظهار وعيا عميقا بالمشاكل الجارية و
Provide patient care that is appropriate,	النظريات الحديثة في مجال التخصص
compassionate for dealing with effective and	، سريات ، سيات عي نجال ،
health Problems and health promotion.	
7- Acquire an in depth understanding of	
common areas of speciality, from basic	
clinical care to evidence based clinical	
application, and possession of skills to	
manage independently all problems in these	
areas.	
6- Identify and create solutions for health	6-تحديد المشكلات المهنية و إيجاد حلولا
problems in Clinical pathology.	مبتكرة لحلها
5- Function as a leader of a team to	
provide patient care that is appropriate,	7-إتقان نطاقا واسعا من المهارات المهنية في مجال التخصص
effective and compassionate for dealing	مجال التخصص
with health problems and health	
promotion.	

	1
7- Acquire an in depth understanding of common areas of Clinical pathology,	
from basic clinical care to evidence based	
clinical application, and possession of	
skills to manage independently all	
problems in these areas.	
8 - Share in updating and improving clinical	milit the second O
practice in Clinical pathology.	8- التوجه نحو تطوير طرق و أدوات و
- Function as teacher in relation to colleagues,	أساليب جديدة للمزاولة المهنية
medical students and other health professions.	
9- Use recent technologies to improve his practice	1 " 1. 11" 1
in Clinical pathology.	9-استخدام الوسائل التكنولوجية المناسبة بما
in Chincal pathology.	يخدم ممارسته المهنية
8- Demonstrate leadership competencies including	10-التواصل بفاعلية و قيادة فريق عمل في
interpersonal and communication skills that	سياقات مهنية مختلفة
ensure effective information exchange with	
individual patients and their families and	
teamwork with other health professions, the	
scientific community and the public.	
5- Function as a leader of a team to	
provide patient care that is appropriate,	
effective and compassionate for dealing	
with health problems and health	
promotion.	
10- Master decision making capabilities in	11 اتخاذ القرار في ظل المعلومات المتاحة
different situations related to Clinical	" ' ' '
pathology.	
11- Show leadership responsiveness to the	12-توظيف الموارد المتاحة بكفاءة و تنميتها
larger context of the health care system,	والعمل على إيجاد موارد جديدة
including e.g. the organisation of health	والمعل هي إيجاد موارد جديده
care, partnership with health care	
providers and managers, practice of cost-	
effective health care, health economics,	
and resource allocations.	
12- Demonstrate in depth awareness of public	13-الوعي بدوره في تنمية المجتمع والحفاظ
health and health policy issues including	- " "
independent ability to improve health care,	على البيئة
and identify and carryout system-based	
improvement of care.	
13- Show model attitudes and professionalism.	14-التصرف بما يعكس الالتزام بالنزاهة و
	14-التصرف بما يعكس الالتزام بالنزاهة و المصداقية و قواعد المهنة

- 14- Demonstrate commitment for lifelong learning and maintenance of competence and ability for continuous medical education and learning in subsequent stages and in Clinical pathology or one of its subspecialties.
- 15- Use recent technologies to improve his practice in Clinical pathology.

15-الالتزام بالتنمية الذاتية المستمرة و نقل علمه و خبراته للآخرين

2- Academic standards

### NAQAAE General ARS for postgraduate Programs 2.1. A- Established, updated and evidence- based theories, basics and developments of Clinical pathology and relevant sciences. 2.1. B- Basic, methods and ethics of medical research. 2.1. C- Ethical and medicologal principles of medical practice related to Clinical pathology. 2.1. D- Principles and measurements of quality in Clinical pathology. 2.1. D- Principles and measurements of quality in Clinical pathology. 2.1. E- Principles and efforts for maintains and improvements of public health. 2.2. A- Application of basic and other relevant science to solve Clinical pathology related problems. 2.2. B- Problem solving based on available data. 2.2. C- Involvement in research studies related to Clinical pathology 2.2. D- Writing scientific papers. 2.2. F- Risk evaluation in the related clinical pathology ###################################	2- Academic star	
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2.2.F- Planning for performance improvement in Clinical pathology	2.2. E- Risk evaluation in the related clinical practice	2-2—ه تقييم المخاطر في الممارسات
Clinical pathology		المهنية
Clinical pathology التخصص		2-2-و التخطيط لتطوير الأداء في مجال
	Clinical pathology	التخصص

2-2-G- Creation and innovation in the Clinical pathology.	2-2-ز - الابتكار /الإبداع
2.2. H- Evidence – based discussion.	2-2-ح- الحوار والنقاش المبني علي البراهين والأدلة
2.2.I- Discussion making in different situations related to Clinical pathology.	2-2-ط اتخاذ القرارات المهنية في سياقات مهنية مختلفة
 2.3. A- MD students must be able to provide extensive level of patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health extensive level means in depth understanding and from basic science to evidence – based clinical application and possession of skills to manage independently all problems in Clinical pathology. 2.3. B- Master patient care skills relevant to Clinical pathology or patients with all diagnoses and procedures. 	2-3-أ -إتقان المهارات المهنية الأساسية و الحديثة في مجال التخصص
2.3. C- Write and evaluate reports for situations related to the field of Clinical pathology.	2-3-ب- كتابة و تقييم التقارير المهنية.
2.4.A-Master 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-ج -تقييم و تطوير الطرق و الأدوات القائمة في مجال التخصص
2.4.B- Use competently all information sources and technology to improve his practice.	3-2—د – استخدام الوسائل التكنولوجية بما يخدم الممارسة المهنية
2.4.A-Master 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.G- Participate in improvement of the education system.	2-3-هـ -التخطيط لتطوير الممارسة المهنية وتنمية أداء الآخرين

II-Program ARS versus program ILOs

Comparison between ARS- ILOS for medical doctorate

(ARS)	(ILOs)
2-1- Knowledge and understanding	2-1- Knowledge and understanding
2-1-A- Established, updated and evidence-based Theories, Basics and developments of Clinical pathology and relevant sciences.	2-1-A- Demonstrate in-depth knowledge and understanding of theories, basics and updated biomedical, clinical epidemiological and socio behavioral science relevant to his speciality as well as the evidence — based application of this knowledge to patient care.
2-1-B Basic, methods and ethics of medical research.	2-1-B- Explain basics, methodology, tools and ethics of scientific medical, clinical research.
2-1-C- Ethical and medicologal principles of medical practice related to Clinical pathology field.	2-1-C- Mention ethical, medico logical principles and bylaws relevant to his practice in the field of Clinical pathology.
2-1-D- Principles and measurements of quality in the Clinical pathology.	2-1-D- Mention principles and measurements of quality assurance and quality improvement in medical education and in clinical practice of Clinical pathology.
2-1-E-Principles and efforts for maintains and improvements of public health.	2-1-E- Mention health care system, public health and health policy, issues relevant to this speciality and principles and methods of system — based improvement of patient care in common health problems of the field of Clinical pathology.
2-2- Intellectual skills:	2-2- Intellectual skills:
2-2-A- Application of basic and other relevant science to solve Clinical pathology. related problems.	2-2-A- Apply the basic and clinically supportive sciences which are appropriate to Clinical pathology related conditions / problem / topics.

2-2-B-Problem solving based on available data.	2-2-B- Demonstrate an investigatory and analytic thinking "problem – solving "approaches to clinical situation related to Clinical pathology.
2-2-C- Involvement in research studies related to the Clinical pathology .	2-2-C- Plain research projects.
2-2-D Writing scientific papers.	2-2-D- Write scientific paper.
2-2-E- Risk evaluation in the related clinical practice.	2-2-E- Participate in clinical risk management as a part of clinical governance.
2-2-F- Planning for performance improvement in the Clinical pathology field.	2-2-F- Plan for quality improvement in the field of medical education and clinical practice in his speciality.
2-2-G- Creation and innovation in the speciality field.	2-2-G- Create / innovate plans, systems, and other issues for improvement of performance in his practice.
2-2-H- Evidence – based discussion.	2-2-H- Present and defend his / her data in front of a panel of experts.
2-2-I-Decision making in different situations related to Clinical pathology fields.	2-2-I- Formulate management plans and alternative decisions in different situations in the field of the Clinical pathology

continuous (ARS)

2-3- Clinical skills:

- 2-3-A- MD students must be able to provide extensive level of patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health extensive level means in depth understanding and from basic science to evidence based clinical application and possession of skills to manage independently all problems in his field of practice.
- **2-3-B-** Master patient care skills relevant to Clinical pathology for patients with all diagnoses and procedures.

continuous (ILOS)

<u> 2/3/1/Practical skills (Patient care :)</u>

- **2-3-1-A-** Provide extensive level of patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. *p.s.* Extensive level means in-depth understanding from basic science to evidence based clinical application and possession of skills to manage independently all problems in field of practice.
- **2-3-1-B-** Provide extensive level of patient care for patients with all common diagnoses and for uncomplicated procedures related to Clinical pathology
- 2-3-1-C- Provide extensive level of patient care for non-routine, complicated patients and under increasingly difficult circumstances, while demonstrating compassionate, appropriate and effective care.
- **2-3-1-D-** Perform diagnostic and therapeutic procedures considered essential in the field of Clinical pathology
- **2-3-1-E-** Handles unexpected complications, while demonstrating compassion and sensitivity to patient needs and concerns.
- **2-3-1-F-** Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families in the Clinical pathology related situations.
- **2-3-1-G-** Gather essential and accurate information about patients of the Clinical pathology related conditions.

	2-3-1-H Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence and clinical judgment for the Clinical pathology
	related conditions. 2-3-1-I- Develop and carry out patient management plans for Clinical pathology related conditions. 2-3-1-J- Counsel and educate patients and their families about Clinical pathology related conditions.
	2-3-1-K- Use information technology to support patient care decisions and patient education in all Clinical pathology related clinical situations.
	 2-3-1-L- Perform competently all medical and invasive procedures considered essential for the Clinical pathology related conditions / area of practices. 2-3-1-M- Provide health care services aimed at preventing the
	Clinical pathology related health problems. 2-3-1-N- Lead health care professionals, including those from other disciplines, to provide patient-focused care in
2-3-C- Write and evaluate reports for situations related to the field Clinical pathology.	2-3-1-O- Write competently all forms of professional reports related to the Clinical pathology (lab reports, experiments reports,).
2-4-A- Master 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-A- Demonstrate the competency of continuous evaluation of different types of care provision to patients in the different area of Clinical pathology

	2-3-2-B- Appraise scientific evidence.
	 2-3-2-C- Continuously improve patient care based on constant self-evaluation and <u>life-long learning</u>. 2-3-2-D. Participate in clinical audit and research projects.
	2-3-2-E- Practice skills of evidence-based Medicine (EBM).
	2-3-2-G- Design logbooks.
	 2-3-2-H- Design clinical guidelines and standard protocols of management. 2-3-2-I- Appraise evidence from scientific studies related to the patients' health problems.
2-4-B- Use competently all information source and technology to improve his practice.	2-3-2-J- Apply knowledge of study designs and statistical methods to the appraisal of clinical studies.
	2-3-2-K - Use information technology to manage information, access online medical information; for the important topics.
2-4-C- Master skills of teaching and evaluating others.	2-3-2-F- Educate and evaluate students, residents and other health professionals.
2-4-D- Master interpersonal and communication Skills that result in effective information exchange and teaming with patients, their families, and other health professionals.	communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals, including: • Present a case. • Write a consultation note. • Inform patients of a diagnosis and
	therapeutic plan Completing and maintaining comprehensive.

• Timely and legible medical records. Teamwork skills. 2-3-2-M- Create and sustain a therapeutic and ethically sound relationship with patients. 2-3-2-N- Elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills. 2-3-2-O- Work effectively with others as a member or leader of a health care team or other professional group. **2-4-E-** Master Professionalism behavior, as **2-3-2-P-** Demonstrate respect, compassion, and integrity; a responsiveness to the manifested through a commitment to carrying out professional responsibilities, needs of patients and society. adherence to ethical principles, and **2-3-2-Q-** Demonstrate a commitment to sensitivity to a diverse patient population. ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices. 2-3-2-S- Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities. 2-3-2-T- Work effectively in health care 2-4-F- Demonstrate an awareness of and delivery settings and systems responsiveness to the larger context and system of health care and the ability to related to Clinical pathology including effectively use system resources to provide good administrative and time care that is of optimal value. management. **2-3-2-U-** Practice cost-effective health **2-4-G**- Participate in improvement of the educ care and resource allocation that system. does not compromise quality of care. **2-3-2-U-** Advocate for quality patient care and assist patients in dealing with system complexities. 2-3-2-V- Design, monitor and evaluate specification of under and post graduate courses and programs.

2-4-H- Demonstrate skills of leading scientific meetings including time management	 2-3-2-W- Act as a chair man for scientific meetings including time management 2-3-2-U- Work effectively in health care delivery settings and systems related to Clinical pathology including good administrative and time management.
2-4-O- Demonstrate skills of self and continuous learning.	From A –H.

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	
Course 1 : Medical statistics		✓				
course 2: Research methodology		✓				
Course 3: Medicolegal Aspets and Ethics in Medical Practice and Scientific Research.			✓			
Course 4: Cytogentics	✓			✓		
Course 5: Molecular Biology	✓			✓		
Course 6: Instrumentation and Equipments	✓			✓		
Course 7: Clinical pathology (Advanced)	✓	√	√	√	√	

Intellectual

Course				Program	n covere	ed ILOs			
	2/2/A	2/2/B	2/2/C	2/2/D	2/2/E	2/2/F	2/2/G	2/2/H	2/2/I
Course 1 : Medical statistics			✓	✓				✓	
course 2 : Research methodology			✓	✓				√	
Course 3: Medicolegal Aspets and Ethics in Medical Practice and Scientific Research.								✓	
Course 4: Cytogentics	✓	✓							
Course 5: Molecular Biology	√	✓							
Course 6: Instrumentation and Equipments	√	√						√	
Course 7: Clinical pathology (Advanced)	✓	√	√	√	✓	√	√	√	√

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 : Medical statistics								
course 2 : Research methodology								
Course 3: Medicolegal Aspets and Ethics in Medical Practice and Scientific Research.								~
Course 4: Cytogentics								
Course 5: Molecular Biology	√	√	√	√				√
Course 6: Instrumentation and Equipments								
Course 7: Clinical pathology (Advanced)	√	√	√	√	√	√	√	√

Practical Skills (Patient care)

Course	Program covered ILOs						
	2/3/1/I	2/3/1/J	2/3/1/K	2/3/1/L	2/3/1/ M	2/3/1/N	2/3/1/0
Course 1: Medical statistics							
course 2 : Research methodology							
Course 3: Medicolegal Aspets and Ethics in Medical Practice and Scientific Research.							
Course 4: Cytogentics							
Course 5: Molecular Biology	√	✓	✓	√	✓	✓	✓
Course 6: Instrumentation and Equipments							
Course 7: Clinical pathology (Advanced)	√	√	√	√	√	√	√

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 : Medical statistics		√						
course 2 : Research methodology		✓		✓	~			
Course 3: Medicolegal Aspets and Ethics in Medical Practice and Scientific Research.								
Course 4: Cytogentics								
Course 5: Molecular Biology	√	✓	✓	✓	√	✓	✓	√
Course 6: Instrumentation and Equipments								
Course 7: Clinical pathology (Advanced)	√	✓	✓	✓	√	✓	✓	√

General skill

Course			Pr	ogram co	vered IL0	Os		
	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	2/3/2/ P
Course 1: Medical statistics	√	√	√					
course 2 : Research methodology	✓	✓						
Course 3: Medicolegal Aspets and Ethics in Medical Practice and Scientific Research.				√				
Course 4: Cytogentics			√	√		$\sqrt{}$		V
Course 5: Molecular Biology	√	√	√	√	√	√	√	√
Course 6: Instrumentation and Equipments			√	√		1		1
Course 7: Clinical pathology (Advanced)	- √	- √		<u>√</u>	<u>√</u>	<u>√</u>	<u>√</u>	- √

General Skills

Course	Program covered ILOs							
	2/3/2/Q	2/3/2/R	2/3/2/S	2/3/2/T	2/3/2/U	2/3/2/V	2/3/2/W	
Course 1 : Medical statistics								
course 2 : Research methodology								
Course 3: Medicolegal Aspets and Ethics in Medical Practice and Scientific Research.								
Course 4: Cytogentics			$\sqrt{}$					
Course 5: Molecular Biology	✓	✓	✓	✓	√	√	√	
Course 6: Instrumentation and Equipments			V					
Course 7: Clinical pathology (Advanced)	√	✓	✓	√	√	√	√	

Annex 7, Additional information:

Department information

Equipments and Specialized Units

- Total laboratory automation include **Chemistry Lab** (equipped 1800 and Cobas Integra 800), Hemaology lab(Advia 2120 and sysmex hematology analyzer

XL300, and Sibia electrophoresis).

- Hormone Lab (equipped with Immulite).
- **Hematology lab** (equipped with cell counters).
- Blood Bank
- Hemostasis Lab (SYSMEX Automated Coagulation Analyser (CA500, CA1500), St-Art Coagulometer, Platelet Function Analyser PF-100, Platelet aggregometer (BIO DATA)
- **Immunology Lab** (equipped with AxSym, Uni-cab 100, Nephelometry).
 - **PCR unit equipped** with Omngen thermal cycler, electrophoresis, Cobas amplicor, and real time PCR.
 - **Bacteriology Lab** (equipped with VITEK2, BACT/ALERT Blood Culture).
- **Emergency lab** (equipped with Spekol II, Spectrophotometer Erma,

Easylyte Na, K, Li, Easylyte Na, K, Ca, PH, Autoanalyser Dimension

Xpand plus, Immulite for treponin I, cell counters and coaggulometers).

- **Daily out patients lab** equipped with Erba XL300, Cobas integra 400, cell counters and coagulometers).
 - Seminar room with data show