كلية الطب
وحدة ضمان الجودة

Faculty of Medicine
QualityAssurance Unit

Medical Doctorate (M.D.) Degree Program and Courses Specification for Nuclear Medicine

According to Currently applied Credit point by law

Clinical Oncology and Nuclear Medicine

Faculty of Medicine

Aswan University

2019- 2020

Contents

A. Professional Information

1- Program aims

1/1 To enable candidates to master high level of clinical skills, bedside care skills, in addition to update medical knowledge as well as clinical experience and competence in the area of Nuclear Medicine and enabling the candidates of making appropriate referrals to a sub-specialist

1/2 Provide candidates with fundamental knowledge of Nuclear Medicine as regards; mastering dealing with patients, Nuclear Medicine equipments, techniques, indications, contraindications and training skills of different nuclear medicine procedures.

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 candidates to describe the basic ethical and medicolegal principles relevant to Nuclear Medicine

1/5 To enable candidates to have professional careers as a consultant in Egypt but recognized abroad.

1/6To enable candidates to continue self learning in subspecialties.

1/7 To enable candidates to master different research methodology 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 theories, basics and updated biomedical, clinical epidemiological and socio–behavioral science relevant to Nuclear medicine as well as the evidence–based application of this knowledge to patient care.

B. Explain basics, methodology, tools and ethics of scientific medical, clinical research.

C. Mention ethical, medico logical principles and bylaws relevant to his practice in the field of Nuclear Medicine.

D. Mention principles and measurements of quality assurance and quality improvement in medical education and in clinical practice of Nuclear Medicine

E. Mention health care system, public health and health policy, issues relevant to Nuclear Medicine and principles and methods of system –based improvement of patient care in common health problems of the field of Nuclear Medicine

2/2 Intellectual outcomes

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

2/3 Skills

2/3/1 Practical skills (Patient Care)

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.

B. provides extensive level of patient care for patients with all common diagnoses and for uncomplicated procedures Nuclear Medicine

C. provides extensive level of patient care for non-routine, complicated patients and under increasingly difficult circumstances, while demonstrating compassionate, appropriate and effective care.

D. Perform diagnostic and therapeutic procedures considered essential in the field of Nuclear Medicine

E. Handel unexpected complications, while demonstrating compassion and sensitivity to patient needs and concerns.

F. Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families in Nuclear Medicine related situations**.**

G, Gather essential and accurate information about patients of Nuclear Medicine related conditions.

H. Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence and clinical judgment for Nuclear Medicine related conditions.

I. Develop and carry out patient management plans for Nuclear Medicine related conditions.

J. Counsel and educate patients and their families about speciality related conditions.

K. Use information technology to support patient care decisions and patient education in all Nuclear Medicine related clinical situations.

L. Perform competently all medical and invasive procedures considered essential for Nuclear Medicine related conditions / area of practices.

M. Provide health care services aimed at preventing Nuclear Medicine related health problems.

N. Lead health care professionals, including those from other disciplines, to provide patient-focused care in Nuclear Medicine related conditions**.**

O. Write competently all forms of patient charts and sheets including reports evaluating these charts and sheets.(Write and evaluate a consultation note, Inform patients of a diagnosis and therapeutic plan, completing and evaluating comprehensive, timely and legible medical records)

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 care provision to patients in the different area of Nuclear Medicine

B. Appraise scientific evidence.

C. Continuously improve patient care based on constant self-evaluation and life-long learning.

D. Participate in clinical audit and research projects.

E. Practice skills of evidence-based Medicine (EBM).

F. Educate and evaluate, residents and other health professionals.

G. Design logbooks.

H. Design clinical guidelines and standard protocols of management.

I. Appraise evidence from scientific studies related to the patients' health problems.

J. Apply knowledge of study designs and statistical methods to the appraisal of clinical studies.

K. Use information technology to manage information, access on-line medical information; for the 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 therapeutic plan completing and maintaining comprehensive.
- Timely and legible medical records.

- Teamwork skills.

M. Create and sustain a therapeutic and ethically sound relationship with patients.

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 team or other professional group.

Professionalism

P. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients 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 Nuclear Medicine including good administrative and time management.

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 Medical Doctorate (MD) degree in Nuclear Medicine

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

In preparing these standards, the General Academic Reference Standards for post graduate programs (GARS) were adopted. These standards set out the graduate attributes and academic characteristics that are expected to be achieved by the end of the program. These standards were approved by the faculty council on 20/ 3/2010. These standards were revised and approved without changes by the Faculty Council

4- Program External References(Benchmarks)

2. ACGME (Accreditation Council for Graduate Medical Education).

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

3. American Board of Nuclear Medicine

http://en.wikipedia.org/wiki/American_Board_of_Nuclear_Medicine

Comparison between program and external reference		
Item	**Nuclear Medicine program**	**American Board of Nuclear Medicine**
Goals	Matched	Matched
ILOS	Matched	Matched
Duration	4-6 years	Different
Requirement	Different	Different
Program structure	Different	Different

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 CP (23.1%), practical 123 (76.9%), total 160 CP
Thesis and researches: 80 CP (33.3%)

First part
Didactic 10 (100%), practical 0 (0 %), 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 science courses	10	4.1%
Humanity and social courses	3	1.2%
Speciality 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

- Part 1

Program-related basic science courses

Program-related basic science 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 basic science 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

- Part 2

Program–related Speciality 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/practical exams of each course and 60% of summation of the written exams, oral and clinical .practical exams of each course

Total degrees 1700 marks.

500 marks for first part

1200 for second part

Written exam 40% - 70%.

Clinical/practical and oral exams 30% - 60%.

D- Curriculum Structure: (Courses):

Levels and courses of the program:

Courses and student work load list	Course Code	Credit points		
		didactic #	training	total
First Part				
Basic science courses (10 CP)				
Course 1: Medical Statistics	FAC309A	1		1
Course 2: Research Methodology	FAC309B	1		1
Course 3: Medicolegal Aspects & Ethics in Medical Practice and Scientific Research	FAC310C	1		1
Course 4:Pathology	CLO305	3		3
Course 5: Internal Medicine	CLO318	2		2
Course 6: General Surgery	CLO311	2		2
Elective courses*	3 CP			
- Elective course 1		1.5		1.5
- Elective course 2		1.5		1.5
Thesis	40 CP			
Published researches**	40 CP			
Second Part	Speciality courses 24 CP Speciality Clinical Work (log Book) 123 CP			
Speciality Courses **Course 5 " Nuclear Medicine"***	CLO327	24		24
Speciality Clinical Work (123 CP)	CLO327		123	123
Total of second part		24	123	147

#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.
- Evidence based medicine.
- Advanced infection control.
- Quality assurance of medical education.
- 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.

***Course 7 Nuclear Medicine**

Units' Titles' list	% from total	Level (Year)	Core Credit points		
			Didactic	training	Total
1) Unit 1 "Clinical Nuclear Medicine	66.7%	1,2&3	16	82	98
2) Unit 2 " Radio-isotopes therapy	33.3%	3&4	8	41	49
Total No. of Units:	2		24	123	147

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

I. General Requirements:

- Master degree in the nuclear medicine

II. Specific Requirements:

- 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 basic science, elective and speciality courses of this program as regulated by the post graduates approved rules by the faculty council.
2. Completing all scheduled CP and log book (minimum 80%).
3. Discussion and acceptance of the 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: Structured essay questions Objective questions MCQ Problem solving	K & I
Clinical: Long/short cases OSCE	K ,I, P &G skills
Structured oral	K ,I &G skills
Logbook assessment	All
Research assignment	I &G skills

Weighting of assessments:

Courses	**Degrees**				
Courses	Course Code	Written Exam	Oral *	Practical / Clinical Exam	Total
First Part					
Basic science courses:					
Medical Statistics	FAC309A	35	15		50
Research Methodology	FAC309B	35	15		50
Medicolegal Aspects & Ethics in Medical Practice and Scientific Research	FAC310C	35	15		50
Course 4:Pathology	CLO305	90	60		150
Course 5: Internal Medicine	CLO318	100			100
Course 6: General Surgery	CLO311	100			100
Total of the first part					500
Second Part					
	Course code	written	Oral *	Practical / Clinical Exam	total
Speciality Courses					
* "Nuclear Medicine " Paper 1 : Clinical Nuclear Medicine 1 Paper 2: Clinical Nuclear Medicine 2 Paper 3: Nuclear Medicine Therapeutic Paper 4: Elective subcourse in Nuclear Medicine	CLO327	 120 120 120 120	360	360	1200
Total of The second part		480	360	360	1200
Elective course 1		50	50		100
Elective course 2		50	50		100

*Nuclear Medicine

Units' Titles' list	% from total Marks	Degrees			
		Written Exam	Oral Exam	Practical / Clinical Exam	Total
1) Unit 1 "Clinical Nuclear Medicine	66.7%	320	240	240	800
2) Unit 2 " Radio-isotopes therapy	33.3%	160	120	120	400
Total No. of Units:	2	480	360	360	1200

* 25% of the oral exam for assessment of logbook

500 marks for first part

1200 for second part

Written exam 40% (480 marks)

Clinical /practical and oral exams 60% (720 marks)

Two elective courses 200

- **Examination system:**

➢ **First part:**

- Written exam 2 hours in Medical Statistics and Research Methodology + oral examination
- Written exam 1 hours in Medicolegal Aspects and Ethics in Medical Practice and Scientific Research + oral examination
- Written exam 3 hours in Pathology + oral exam
- Written exam 1 hour in Internal Medicine
- Written exam 1 hour in General Surgery

➢ **Second part:**

- Written exam four papers 3 hours for each in Nuclear Medicine (Paper 1 : Clinical Nuclear Medicine 1, Paper 2: Clinical Nuclear Medicine 2, Paper 3: Nuclear Medicine Therapeutic, Paper 4: Elective subcourse in Nuclear Medicine) + Oral exam+ Clinical/Practical exam

➢ **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 Unit	Reports Field visits	#
External Evaluator (s):According to department council External Examiner(s): According todepartment council	Reports Field visits	#
Stakeholders	Reports Field visits Questionnaires	#
Senior students	Questionnaires	#
Alumni	Questionnaires	#

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

11-Declaration

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

All course specifications for this program are in place.

Contributor	Name	Signature	Date
▪ **Program Principle Coordinator:**	Prof. Dr./ Mohammad A. Mekkawy		
▪ **Head of the Responsible Department (Program Academic Director):**	Prof Dr./ Samir Shehata		

Annex 1, Specifications for Courses / Modules

Annex 1: specifications for courses

First Part

1) Course 1: Medical Statistics
2) Course 2: Research Methodology
3) Course 3: Medicolegal Aspects and Ethics in Medical Practice and Scientific Research
4) Course 4: Pathology
5) Course 5: Internal Medicine
6) Course 6: General Surgery

Course 1: Medical statistics

Name of department: Public Health and Community Medicine

Faculty of medicine

Assiut University

2016-1017

1. Course data

- **Course Title: Medical statistics**
- **Course code: FAC309A**
- **Speciality: offered to all clinical and academic specialties**
- **Number of credit points: 1 credit point**
- **Department (s) delivering the course:** Pubic Health and Community Medicine
- **Coordinator (s):**
  - Course coordinator: Prof. Ahmed M. Hany
  - Assistant coordinator (s):
    Prof. Farag Mohammed Moftah
    Prof. Hosnia Saeed Abdel Majeed
- Date last reviewed: September 2017
- **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 teaching/ learning	Methods of Evaluation
A. List the types of variables	Lecture and discussion	Written examination
B. Identify the methods of data collection	Lecture and discussion	Written examination
C. Describe the different sampling strategies	Lecture and discussion	Written examination
D. Identify types of tabular and graphic presentation of data	Lecture and discussion	Written examination
E. Identify measures of central tendency and dispersion	Lecture and discussion	Written examination
F. Identify the characters of normal distribution curve.	Lecture and discussion	Written 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

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 A	**Intellectual B**	**Practical skills C**	**General Skills D**
Introduction	A-F	A-D	-	A&B
Tables and graphics	D	A-D	-	A&B
Sampling	C	-	-	A&B
Methodology of data collection	B	-	-	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 SPSSv.16

6. Course assessment methods:

i. Assessment tools:

1. Practical examination
2. Attendance and active participation
3. Assignments
4. SPSS examination
5. 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 oral exam).

7. List of references

i. Lectures notes

Department lecture notes

ii. Essential books

Medical statistics

iii. Recommended books

Discovering statistics using SPSS

iii. Periodicals, Web sites, etc

8. Signatures

Course Coordinator: - Prof. Ahmed M. Hany	**Head of the Department:** - Prof. Omaima El Gibaly
Date: 17- 9-2017	**Date**: 17- 9-2017

Course 2: Research Methodology

Name of department: All clinical and academic departments
Faculty of medicine
Assiut University
2015-2016/2016-2017

1. Course data

- **Course Title: Research methodology**
- **Course code: FAC309B**
- **Speciality: 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. Ali Zarzour**
  - **Assistant coordinator (s):**

    Prof. Mohamed H. Qayed

    Prof. Omaima El-Gibaly

- **Date last reviewed:** September 2017
- **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:

- Research proposal,
- Writing planning and implementing rigorous research,
- Writing and publishing scientific papers.

3. Intended learning outcomes (ILOs): To be able to write a rigorous research proposal

A knowledge and understanding

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Explain differences between different study designs	Lecture and discussion	Written examination
B. Identify sources and types of bias in research		
C. Describe the different sampling strategies, and compute sample size		
D. Select and design valid measurement tools for research		
E. Explain ethical issues in conducting research on human subjects		
F. describe the rules of authorship in scientific writing		
G. List the steps involved in proposal writing		

H. Identify a research problem within a conceptual framework	Lecture on Criteria to Consider to identify a research problem	discussion
I. Use the web sources to do a literature search	Practical tutorial on web	assignment
J. Select the appropriate study design for the research question	Lecture on various study designs	Written examination
K. Minimize bias in designing research	Lecture on the different types of bias	Written examination
L. Screening & theoretical background	Lectures on criteria for successful screening program& criteria for evaluation a screening test.	Written examination

B. intellectual

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. Apply basic science & knowledge for appraising scientific literature	Discussions &seminars	Written examination

C. Practical skills

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. Develop a budget and time line for the research	Tutorial	Assignments
B. Design a data entry file	Tutorial on Epi-info or Excel	Assignments Written exam
C. Identify steps required in fielding the study	Lecture	Assignments Written exam
D. Identify steps required for calculation Sensitivity, Specificity, positive predictive value, negative predictive value, Accuracy of a screening test	Lecture	Assignments Written exam

D general skills

Practice based learning improvement & professionalism

(Scientific Paper writing skills)

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. To be able to write an abstract	Tutorial	Written examination case study for critque
B. Write the introduction	Tutorial	Written examination
C. Write the methodology section	Tutorial	Written examination
D. Present the results	Tutorial	Written examination
E. Perform Discussion section	Tutorial	Written examination
F. Learn Authorship ethical rules	Tutorial	Written examination

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

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge A	Intellectual B	Practical skills C	General Skills D
Introduction & proposal writing	G	A	A	A-F
Epidemiological Study designs	A,J	A	B,C	-
Screening & theoretical background	L	A	-	-
Screening practical	L	A	D	-
Sample size calculation	B	A	B,C	-
Research bias	H	A	C	F
Ethics in research	E,F	A	C	F

5. Course Methods of teaching/learning:

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

6. Course assessment methods:

i. Assessment tools:

1. Written examination
2. Attendance and active participation
3. Class
4. Assignments

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

- Department lecture notes

ii. Essential books

- An epidemiologic Approach to Reproductive Health,CDC,FHI, and WHO Phyllis A. wingo, James E.Higgens, Goerge L. Rubin, and S.Christine Zahniser

iii. Recommended books

- Evidence Based Medicine How to practice and teach EBM.
- David Sachett, Sharon E. Straus, W.Scott Richardson , William Rosenberg R.Brain Haynes

iv. Periodicals, Web s ites,... etc

- Dissertation workshop open courseware JHSPH

8. Signatures

Course Coordinator: - Prof. .Ali Zarzour	**Head of the Department:** - Prof. Omaima El Gibaly
Date: 17-9-2017	**Date:** 17-9-2017

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
2016-2017

1. Course data

- **Course Title: Medicolegal Aspects and Ethics in Medical Practice and Scientific Research**
- **Course code: FAC310C**
- **Speciality:** ***General medicine, Special medicine, Pediatrics, Public health, Oncology and Rheumatology*** **(1st part).**
- **Number of credit points: 1 credit point**
- **Department (s) delivering the course: Forensic Medicine and Clinical Toxicology**

- **Coordinator (s):**
  - **Course coordinator:**
    Prof. Wafaa Mohamed Abdel Moneium
  - **Assistant coordinator (s) Assist.**
    Prof. Amal Ali. Mohammed

- **Date last reviewed: September 2017.**

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

2. Course Aims

To describe the basic ethical and medicolegal principles and bylaws relevant to practice in the field of General medicine, Special medicine, Pediatrics, Public health, Oncology and Rheumatology

3. Intended learning outcomes (ILOs):

A knowledge and understanding

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. Mention principals of Taking consent.	Lecture and discussion	Oral &Written exam
B. Mention principals of Writing a death certificate	Lecture and discussion	Oral &Written exam
C. Mention principals of diagnosing death.	Lecture and discussion	Oral &Written exam
D. Mention principals of writing toxicological reports.	Lecture and discussion	Oral &Written exam
E. Explain principals of medical reports.	Lecture and discussion	Oral &Written exam
F. List indications and principals of induced emesis, gastric lavage and samples collection.	Lecture and discussion	Oral &Written exam

B. intellectual

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. Present case, seminars in death certificate	Lecture and discussion	Oral &Written exam
B. Present case, seminars in toxicological cases	Lecture and discussion	Oral &Written exam

C. Practical skills

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. Identify medical ethics and ethics in research.	Lecture and discussion	Reading Discussion
B. Prepare and write consent.	Lecture and discussion	Reading Discussion
C. Identify medical responsibilities.	Lecture and discussion	Reading Discussion
D. Write death certificate.	Lecture and discussion	Reading Discussion and active participation
E. Deal with a case of Suspicious death	Lecture and discussion	Reading Discussion and active participation
F. Perform gastric lavage, induce emesis, and obtain samples.		
G. Write medical and toxicological reports	Lecture and discussion	Reading Discussion and active participation
H. Develop and carry out patient		

management plans for Euthanaesia, and Organ Transplantation		
I. Counsel patients and their families about speciality related conditionsincluding Permanent infirmities, Euthanasia, and Organ Transplantation		

D general skills

Competency and Skills	Methods of teaching/ learning	Methods of Evaluation
A. Present a case.	Lectureand discussion	Global rating logbook
B. Write a consultation note	Lecture and discussion	Global rating logbook
C. Inform patients and maintaining comprehensive.	Lecture and discussion	Global rating logbook
D. Make timely and legible medical records	Lectureand discussion	Global rating logbook
E. Acquire the teamwork skills	Lectureand discussion	Global rating logbook

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

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge A	Intellectual B	Practical skills C	General Skills D
1. Death and death certificate.	B,C	A	D,E	A
2. Medical Reports	A		G	A,D,E
3. Toxicological reports	D,F	B	G,F	A,E
4. Ethics in research.	A		A	
5. Medical ethics.	E		A,B,C,H,I	B,C,E

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

- Ballantyne B., Marrs T. and Syversen T.(1999):General and Applied Toxicology.2nd edition. MACMILLAN REFERENCE LTD.UK.
- Bernard Knight and Pekka Saukko (2004): Knight Forensic Pathology. Hodder Arnold press

iii. Recommended books

- Klassen D. (2001): Casarettand Doull s. Toxicology the basic science of poisons. McGrow. Hill press medical publishing division New York

iv. Journal and website

- 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 :
  Forensic Science International Journal.
  Toxicology Letter.

8. Signatures

- Course Coordinator: **Prof. Wafaa Mohamed Abdel Moneium**	**- Head of the Department:** **Prof. Wafaa Mohamed Abdel Moneium**
Date: 13- 9-2017	**Date: 13- 9-2017**

Course 4 Pathology

Name of department: of ***Clinical Oncology and Nuclear Medicine***
Faculty of medicine
Assiut University
2016-2017

1. Course data

- **Course Title: Pathology**
- **Course code:** CLO305
- **Speciality is Nuclear Medicine**
- **Number of credit points:** 3 credit point for didactic (100%)
- **Department (s) delivering the Course : Pathology in conjunction with Clinical Oncology and Nuclear Medicine**
- **Course coordinator:** Prof. Dr./ Mohamed A. Mekkawy

Assistant coordinator (s) Staff member of Pathology as approved by the Department council

- **Date last reviewed: September 2017**
- **Requirements (prerequisites) if any :**
  - **None**
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course aims

The student should acquire the professional knowledge and facts of pathology necessary for Nuclear Medicine.

3. Unit intended learning outcomes (ILOs):

A-Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Describe pathological *details* of: • General pathology of tumors • Thyroid diseases • Cardiology: Ischemic heart disease • Pulmonary embolism • Bone diseases -Tumors Osteomyelitis • Renal diseases -Obstructive Uropathy -Transplant Rejection • Liver diseases - Cirrhosis - Gall bladder diseases • Brain diseases -Tumors - Cerebral ischemia	-Didactic (lectures, seminars, tutorial)	- Written and oral examination - Log book

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Apply the basic (physiological) supportive sciences which are appropriate to Nuclear Medicine related problems.	-Didactic (lectures, seminars, tutorial)	-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 & oral communication	-Oral exam Logbook

Interpersonal and Communication Skills

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

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
B. Demonstrate a commitment to ethical principles.	- Observation and supervision Written & oral communication	Logbook Oral Exam

Systems-Based Practice

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

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

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge A	Intellectual B	Practical skills C	General Skills D
• General pathology of tumors	A	A	-	A-D
• Thyroid diseases	A	A	-	A-D
• Cardiology				
Ischemic heart disease	A	A	-	A-D
Pulmonary embolism	A	A	-	A-D
• Bone diseases				
-Tumors	A	A	-	A-D
-Osteomyelitis	A	A	-	A-D
• Renal diseases				
-Obstructive Uropath	A	A	-	A-D
-Transplant Rejection	A	A	-	A-D
• Liver diseases				
- Cirrhosis	A	A	-	A-D
- Gall bladder diseases	A	A	-	A-D
Brain diseases				
-Tumors	A	A	-	A-D
- Cerebral ischemia	A	A	-	A-D

5. Methods of teaching/learning:

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

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

1. Extra didactic (lectures, seminars, tutorial)

7. Assessment methods:

i. Assessment tools:

1. Written and oral examination
2. Log book

ii. Time schedule: After 12 months from applying to the M D degree.

iii. Marks: 150

8. List of references

i. Lectures notes

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

ii. Essential books

- Pathology text book

iii. Recommended books

- KUMAR, V., COTRAN, R.S., and ROBBINS, S.L. Robbins Basic Pathology. 7th ed. Saunders Publisher

iv. Periodicals, Web sites, … etc

➢ **Periodicals,**

- Human pathology
- Histopathology
- American Journal of surgical pathology

➢ **Web sites:** http://www.ncbi.nlm.nih.gov/pubmed/

iv. others : None

9. Signatures

Course Coordinator: Prof. Dr./ Mohammad A. Mekkawy	**Head of the Department:** Prof Dr./ Samir Shehata
Date:.....	**Date:**.....

Course 5 Internal Medicine

Name of department: of ***Clinical Oncology and Nuclear Medicine***
Faculty of medicine
Assiut University
2016-2017

1. Course data

- **Course Title: Internal Medicine**
- **Course code:** CLO3218
- **Speciality is Nuclear Medicine**
- **Number of credit points:** 2 credit point for didactic (100%)
- **Department (s) delivering the course :** Internal Medicine
- **Unit coordinator:** Prof. Dr./ Mohamed A. Mekkawy
  Assistant coordinator (s) Staff member of Internal Medicine as approved by the Department council
- **Date last reviewed: September 2017**
- **Requirements (prerequisites) if any :** None
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

Course aims

The student should acquire the general medical Background necessary for Nuclear Medicine in clinical reasoning, diagnosis and management of patients receiving radionuclide therapy.

3. Intended learning outcomes (ILOs):

A-Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Mention Principles of the following diseases and clinical conditions: • **Thyroid** Hypothyroidism Hyperthyroidism Thyroiditis Thyroid malignancies • **Heart** CAD Angina Infarction Cardiomyopathy • **Renal** Chronic renal failure Golmerulonephritis Pyelonephritis Kidney transplant Acute renal failure • **Suprarenal** Cushing Addison's	-Didactic (lectures, seminars)	-log book-written exam

Pheochromocytoma • **GIT** Liver cirrhosis Jaundice Causes of hepatosplenomegaly. GIT bleeding. • R**espiratory system** Bronchogenic Cancer Pulmonary embolism • **Parathyroid** Hyperparathyroidism&hypoparathyroidism		
A. Describe details of: • **Thyroid** Hypothyroidism Hyperthyroidism Thyroiditis • **Parathyroid** Hyperparathyroidism&hypoparathyroidism • **Suprarenal** Pheochromocytoma • **Renal:** Chronic renal failure Pyelonephritis Kidney transplant • **Heart** CAD Angina Infarction Cardiomyopathy • **Respiratory system** Bronchogenic carcinoma • **GIT:** Jaundice		
C. State update and evidence based Knowledge of Hypertension, Diabetes mellitus		

D. Memorize the facts and principles of the relevant basic supportive sciences related to topics mentioned in A.A		
E. Mention the basic ethical and medico-legal principles relevant to the topics mentioned in A.A.		
F. Mention the basics of quality assurance to ensure good clinical care in his field		
G. Mention the ethical and scientific principles of medical research		
H. State the impact of common health problems in the field of Internal Medicine on the society.		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Apply the basic and clinically supportive sciences which are appropriate to Nuclear Medicine related problems.	-Clinical rounds -Senior staff experience	-log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Nuclear Medicine.		
C-Formulate management plans and alternative decisions in different situations in the field of the Nuclear Medicine		

C. 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 & oral communication	Logbook

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
B. Write a report • Patients' medical reports	-Senior staff experience	-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	-Observation & supervision -Didactic	-Patient survey
D. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		-Patient survey

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
E. Work effectively in relevant health care delivery settings and systems.	-Observation & supervision -Didactic	-360o global rating
F. 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		-Check list evaluation of live or recorded performance

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

Time Schedule: First part

Topic	Covered ILOs			
	Knowledge A	**Intellectual B**	**Practical skills C**	**General Skills D**
• Thyroid				
-Hypothyroidism	A-H	A	-	-
-Hyperthyroidism	A-H	A-C	-	A-F
-Thyroiditis	A-H	A	-	-
- Thyroid malignancies	A-H	A	-	-
• Parathyroid -Hyperparathyroidism& Hypoparathyroidism	A-H	A-C	-	A-F
• Suprarenal				
-Cushing	A-H	A	-	-
-Addison's	A-H	A	-	-
-Pheochromocytoma	A-H	A-C	-	A-F
• Renal:				
-Chronic renal failure	A-H	A-C	-	A-F
-Golmerulonephritis	A-H	A-C	-	-
-Pyelonephritis	A-H	A-C	-	A-F
-Kidney transplant	A-H	A-C	-	A-F
-Acue renal failure	A-H	A-C	-	A-F
• *Heart*				
-CAD	A-H	A-C	-	A-F
-Angina	A-H	A-C	-	A-F
-Infarction	A-H	A-C	-	A-F
-Cardiomyopathy	A-H	A	-	-

• Respiratory system				
Bronchginec carcinoma	A-H	A	-	-
Pulmonary embolism				
• GIT				
-Liver cirrhosis	A-H	A	-	-
-Jaundice	A-H	A	-	A-F
-Causes of hepato-splenomegaly	A-H	A	-	-
- GIT bleeding.	A-H	A	-	-

5. Methods of teaching/learning:

1. Didactic ; Lectures
2. Clinical rounds
3. Seminars Clinical rotations
4. Post graduate teaching
5. Hand on workshops

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

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

7. Assessment methods:

i. Assessment tools:

1. Written
2. log book

iii. Time schedule: After 12 months from applying to the MD degree.

iv. Marks: 100

8. List of references

i. Lectures notes

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

ii. Essential books

- Davidson's Principles and Practice of Medicine - 20th Edition - 2006-07

iii. Recommended books

- Harrison's Principles of Internal Medicine, 17th Edition by Anthony Fauci, Eugene Braunwald, Dennis Kasper, and Stephen Hauser (Hardcover - Mar 6 2008)

iv. Periodicals, Web sites, … etc

➢ **Periodicals**

- Internal medicine journal
- Annals of Internal medicine journal
- Journal of General Internal Medicine

➢ **Web sites**

- www.pubmed. Com

V. others

None

9. Signatures

Course Coordinator: Prof. Dr./ Mohammad A. Mekkawy ……	**Head of the Department:** Prof. Dr./Samir Shehata ……
Date:……	**Date:**……

Course 6 General Surgery

Name of department: of ***Clinical Oncology and Nuclear Medicine***
Faculty of medicine
Assiut University
2016-2017

1. Course data

- **Course Title: General Surgery**
- **Course code: CLO211**
- **Speciality is Nuclear Medicine**
- **Number of credit points:** 2 credit point for didactic (100%)
- **Department (s) delivering the course : General Surgery**
- **Unit coordinator:** Prof. Dr./ Mohamed A. Mekkawy

Assistant coordinator (s) Staff member of General Surgery as approved by the Department council

Date last reviewed: September 2017

- **Requirements (prerequisites) if any :**
  - **None**
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Unit Aims

The student should acquire the basic surgical Knowledge necessary for clinical reasoning, diagnosis and management of diseases related to Nuclear Medicine.

3. Course intended learning outcomes (ILOs):

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Demonstrate principles of the following clinical conditions: • Thyrotoxicosis • Multinodular Goiter • Solitary thyroid nodule • Benign and malignant thyroid tumors • Parathyroid glands tumors • Suprarenal tumors • Lymphadenopathy • Lymphomas • Breast cancer • Jaundice • Cholecystitis and gall stones • Testicular torsion • Causes of swollen leg & diagnosis of lymphoedema • Clinical picture and diagnosis of osteomylitis Bone metastasis	-Didactic (lectures, seminars, tutorial)	Log book -Written exam
B. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to conditions mentioned in A.A.		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Apply the basic and clinically supportive sciences which are appropriate to Nuclear Medicine related problems.	-Clinical rounds -Senior staff experience	- Log book

C- Practical skills (Patient Care)

Practical Hours: 0 Hours

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	-Clinical round -Seminars -Lectures	-Global rating -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	- 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
E. 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 ILOs			
	Knowledge	Intellectual	Practical skill	General Skills
• Thyrotoxicosis	A,B	A	-	A-E
• Multinodular Goiter	A,B	A	-	A-E
• Solitary thyroid nodules	A,B	A	-	A-E
• Benign and malignant tthyroid tumors	A,B	A	-	A-E
• Parathyroid glands tumors	A,B	A	-	A-E
• Suprarenal tumors	A,B	A	-	A-E
• Lymphadenopathy	A,B	A	-	A-E
• Lymphomas	A,B	A	-	A-E
• Breast cancer	A,B	A	-	A–E
• Jaundice	A,B	A	-	A-E
Cholecystitis and gall stones	A,B	A	-	A-E
Testicular tortion	A,B	A	-	A-E
Causes of swollen leg & diagnosis of lymphoedema	A,B	A	-	A-E
Clinical picture and diagnosis of osteomylitis	A,B	A	-	A-E
Bone metastasis	A,B	A	-	A-E

5. Methods of teaching/learning:

1. Didactic ; Lectures
2. Clinical rounds
3. Seminars Clinical rotations
4. (service teaching) Observation
5. Post graduate teaching
6. Hand on workshops

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

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

7. Assessment methods:

i. Assessment tools:

1. Written examination
2. log book

ii. Time schedule: After 12 months from applying to the M D degree.

iii. Marks: 100 mark

8. List of references

i. Lectures notes

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

ii. Essential books

- (General surgery text books)

iii. Recommended books

- Management of Thyroid Cancer and Related Nodular Disease
- Bailey and love (short practice of surgery)
- Abd Elazeem Refaat

iv. Periodicals, Web sites, … etc

- Surgical Clinics of North America

v. others: None

9. Signatures

Course Coordinator: Prof. Dr./ Mohammad A. Mekkawy	**Head of the Department:** Prof. Dr./ Samir Shehata
Date:	**Date:**

Second Part

Course 7 Clinical Nuclear Medicine

- ***Name of department: Clinical Oncology and Nuclear Medicine***
- ***Faculty of medicine***
- ***Assiut University***
- ***2016-2017***

1. Course data

- **Course Title:** Diagnostic and Therapeutic Nuclear Medicine
- **Course code:** CLO3227A
- **Speciality is Nuclear Medicine**
- 147 credit point - didactic 24 credit point (16.3%) - practical 123 credit point (83.7%)
- Department of Clinical Oncology and Nuclear Medicine - Faculty of Medicine- Assiut- EGYPT
- **Coordinator (s)**

Course coordinator: Prof. Dr./ Mohamed A. Mekkawy

Assistant coordinator (s)

Dr./ Lamiaa Mahmoud

- **Date last reviewed:** September 2017
- **Requirements (prerequisites) if any : None**
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course Aims

1. To gain proficiency in the use of radiopharmaceuticals , performance and interpretation of different diagnostic Nuclear Medicine procedures emphasizing indications, complications and likelihood of successful outcome.
2. To enable MD students to master high level of clinical skills, in addition to update medical knowledge as well as clinical experience and competence in the area of Radio-isotopes therapy.

3. Course intended learning outcomes (ILOs):

Unit 1 (Module) Clinical Nuclear Medicine

A-Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Explain update and evidence based indications, contraindications, procedures and interpretation of the following common radionuclide studies: A. ENDOCRINE SYSTEM: ➢ Thyroid scintigraphy • Indications of thyroid uptake studies and thyroid scans: -Thyroid nodule -Goiter -Ectopic thyroid tissue -Thyrotoxicosis -Thyroiditis	-Didactic (lectures, seminars, tutorial) -Clinical rounds -Seminars -Clinical rotations -Service teaching	OSCE at the end of each year -log book & portfolio - One MCQ examination at the second half of the second year and another one in the third year

-Thyroid cancer • Other thyroid function studies: T_3 suppression, TSH stimulation, Perchlorate discharge test ➢ Parathyroid scintigraphy ➢ Adrenal scintigraphy • Adreno-medullary scintigraphy B.SKELETAL SCINTIGRAPHY: Clinical uses • Primary bone tumors • Metastatic disease • Metabolic bone disease • Skeletal trauma • Assessment of infection, Painful joint prosthesis Vascular manifestations C.HEPATOBILIARY SYSTEM: ➢ Cholescintigraphy - Acute and chronic cholecystitis - Biliary duct obstruction - Post operative biliary tract ➢ Tc-99m red blood cell liver scintigraphy ➢ Tc-99m sulphur colloid liver spleen imaging ➢ Tc-99m MAA hepatic arterial perfusion D- GENITOURINARY SYSTEM: ➢ Dynamic renal imaging, measuring renal function: GFR and ERPF • Obstructive uropathy • Reno vascular hypertension		-Written and oral examination

• Renal transplant evaluation ➢ Renal cortical imaging • Renal infection • Renal failure ➢ Radionuclide cystography • Vesico-ureteric reflux ➢ Scrotal imaging E- NUCLEAR MEDICINE IN TUMOR DIAGNOSIS: ➢ Ga-67 tumor imaging ➢ Thallium-201, Tc-99m MIBI and Tc-99m tetrofosmin tumor imaging ➢ Lymphoscintigraphy ➢ Lymphatic mapping and sentinel LN detection ➢ Positron emission tomography clinical uses - Lung carcinoma - Head and neck carcinoma - Lymphoma - Melanoma - Others (colorectal, breast, ...) F-GASTRO-INTESTINAL SYSTEM: • Gastrointestinal motility disorders • GIT bleeding G-INFECTION AND INFLAMMATION: Clinical applications: • Osteomyelitis • Infected joint prosthesis • Intra-abdominal infection • Fever of unknown origin H-CENTRAL NERVOUS SYSTEM: ➢ Cerebral perfusion imaging • Dementias • Cerebro-vascular diseases • Brain tumors ➢ Cisternography I-CARDIAC SYSTEM:		

➢ Myocardial perfusion imaging • cardiac stress testing • Diagnosis and evaluation of coronary artery disease • Viability studies • Prognosis and risk stratifications ➢ Radionuclide ventriculography ➢ Infarct avid imaging J-PULMONARY SYSTEM: • Ventilation perfusion scintigraphy in Pulmonary embolism • Interpretation and PIOPED criteria		
B. Mention the principles of : • Radionuclide production • Radio pharmacy • Radio pharmaceuticals: pharmacokinetics, methods of tracer localization and excretion, target organs,..... • Pathophysiology of diseases related to Nuclear Medicine Imaging studies • Image methodology, interpretation, and possible artifacts • Basic physics, detection and counting of radiation in nuclear medicine • Single photon emission computed tomography • Positron emission tomography • Molecular imaging fundamentals • Radiation protection and dosimetry in clinical practice • Nuclear medicine computers	Didactic (lectures, seminars, tutorial) -Clinical rounds -Seminars -Clinical rotations -Service teaching	OSCE at the end of each year -log book & portfolio - One MCQ examination at the second half of the second year and another one in the third year -Written and oral examination
C. Mention bases of the following rare radionuclide studies: ENDOCRINE SYSTEM: • Adrenal cortical scintigraphy	Didactic (lectures, seminars, tutorial)	OSCE at the end of each year -log book &

SKELETAL SCINTIGRAPHY: • Bone scintigraphy in sport medicine NUCLEAR MEDICINE IN TUMOR DIAGNOSIS: • Peptide receptor scintigraphy • Radio-labeled antibodies GASTRO-INTESTINAL SYSTEM: • Intestinal transit time • Heterotopic gastric mucosa CENTRAL NERVOUS SYSTEM: • Blood brain barrier studies • Brain death • Brain imaging in epilepsy psychiatric disorders CARDIAC SCINTIGRAPHY • SPECT for congenital heart disease • PET in cardiology I-123 MIBG imaging of the heart PULMONARY SYSTEM: • Role of scintigraphy in non-embolic lung disease • Radionuclide techniques in assessment of human thrombosis and atheroma APOPTOSIS IMAGING HYPOXIA IMAGING	-Clinical rounds -Seminars -Clinical rotations -Service teaching	portfolio - One MCQ examination at the second half of the second year and another one in the third year -Written and oral examination
D. Explain the facts and principles of the relevant basic supportive sciences related to Clinical Nuclear Medicine.		
E. explain the facts and principles of the relevant clinically supportive sciences related to Clinical Nuclear Medicine.		
F. Describe the basic ethical and medico-legal principles revenant to the Clinical Nuclear Medicine.		
G. describe the basics and measurements of quality assurance to ensure good clinical care in		

the field of Clinical Nuclear Medicine.		
H. Explain the ethical and scientific principles of medical research		
I. Explains the impact of common health problems in the field of Clinical Nuclear Medicine on the society.		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Design & present case in common problem related to Clinical Nuclear Medicine.	Clinical rounds -Senior staff experience	-Procedure and case presentation -Log book & Portfolio
B. Apply the basic and clinically supportive sciences which are appropriate to the Clinical Nuclear Medicine related conditions, problem and topics.		
C. Demonstrate an investigatory and analytic thinking "problem – solving "approaches to clinical situation related to Clinical Nuclear Medicine.		
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 Nuclear Medicine.		

H. Create and 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		

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Take history, examine and clinically diagnose different conditions related to Clinical Nuclear Medicine.	-Didactic (lectures, seminars, tutorial) -Clinical rounds Clinical rotations (service teaching)	OSCE at the end of each year -log book & portfolio - One MCQ examination at the second half of the second year and another one in the third year -Clinical exam
B. order the following non invasive and invasive diagnostic procedures • Blood picture. • Kidney function test. • Thyroid function test. • Other Lab tests according to the case • Tumor markers of thyroid cancer.	-Clinical round with senior staff Observation -Post graduate teaching	-Procedure presentation - Log book - Chick list

• Chest X ray. • Neck sonography • CT & MRI scans according to the case • Fine needle aspiration& True cut needle biopsy	-Hand on workshops -Perform under supervision of senior staff	
C. <u>Interpret the following invasive and non-invasive diagnostic procedures</u> • Nuclear medicine diagnostic procedures mentioned in A.A. • other diagnostic procedures according to the case : o Routine appropriate Lab investigations o X ray Chest, skeletal radiographs o Pulmonary function testing o CT & MRI scans o ECG		
D. Perform different diagnostic nuclear medicine procedures mentioned in A.A	Clinical round with senior staff Observation -Post graduate teaching -Hand on workshops -Perform under supervision of senior staff	Procedure presentation - Log book - Chick list

E. Develop and carry out patient management plans for the conditions mentioned in A.A.		
F. Counsel and educate patients and their family about his/her diagnostic procedure and required precautions	Clinical round with senior staff	
G. Use information technology to support patient care decisions and patient education for Clinical Nuclear Medicine related conditions.	Clinical round with senior staff	
H. Work with health care professionals, including those from other disciplines, to provide patient-focused care.	Clinical round with senior staff	
I. Write competently all forms of patient charts and sheets including reports evaluating these charts and sheets.(Write and evaluate a consultation note, Inform patients of a diagnosis plan, completing and evaluating comprehensive, timely and legible medical records)		

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 mentioned in A.A. (Plan and conduct audit cycles)	Simulations -Clinical round -Seminars -Lectures -Case presentation -Hand on workshops	Global rating -Procedure & case presentation -Log book & Portfolios - Chicklist
B. Locate, appraises, and assimilates evidence from scientific studies related to patients' health problems.	Simulations -Clinical round -Seminars -Lectures -Case presentation -Hand on workshops	Global rating -Procedure & case presentation -Log book & Portfolios - Chicklist
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	Simulations -Clinical round -Seminars -Lectures -Case presentation -Hand on workshops	Global rating -Procedure & case presentation -Log book & Portfolios - Chicklist
G. Perform the following oral communications: Interpretation of the results of different radionuclide scans, discussion with the referring doctor and correlation with other diagnostic imaging modalities		
H. Fill the following reports: -patient medical reports -Pre-test sheet -Report for diagnostic nuclear medicine studies mentioned in A.A.		
I. Work effectively with others as a member or leader of a health care team.		

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.	Observation - Senior staff experience -Case taking	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/ learning	Methods of Evaluation
M. Work effectively in different health care delivery settings and systems.	Observation - Senior staff experience	1. 360o global rating
N. Practice cost-effective health care and resource allocation that does not compromise quality of care		1. Check list evaluation of live or recorded performance
O. Advocate for quality patient care and assist patients in dealing with system complexities		1. 360o global rating 2. 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		

Unit 2 (Module) Radio-isotopes therapy

A-Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
1. Explain update and evidence based etiology, clinical picture, diagnosis and management of the following common diseases and clinical conditions: • Thyroid diseases: -Hyperthyroidism -Secondry toxic goiter -Autonomous toxic adenoma -Differentiated thyroid carcinoma • Neuro-endocrine tumors particularly: ○ Neuroblastoma ○ pheochromocytoma ○ Carcinoid ○ Medullary cancer thyroid • Palliation of metastatic bone pain • Radionuclide therapy of lymphoma • Radionuclide therapy of primary and metastatic hepatic tumors • Somatostatin receptor-targeted radiotherapy • Intracoronary brachytherapy • Radiation synovectomy • Myeloproliferative diseases and their radionuclide treatment (polycythemia vera and essential thrombocythemia)	-Didactic (lectures, seminars, tutorial) -Outpatient -Inpatient -Case presentation -Direct observation	- log book -Objective structure clinical examination (OSCE) One MCQ examination at the second half of the second year -Written and oral exam
<u>B. Mention the principles of:</u> • Cancer cell biology: the basics for nuclear	-Didactic (lectures,	- log book -Objective

oncology imaging and therapy • Principles of radionuclide therapy • Dosimetric and radiobiological considerations • Special considerations for pediatric patients • Alternative approaches to targeting therapy • Use of intra-operative probes in surgical oncology	seminars, tutorial) -outpatient -inpatient -case presentation -Direct observation	structure clinical examination (OSCE) One MCQ examination at the second half of the second year -Written and oral exam
C. Mention basics of the following rare diseases and conditions • Undifferentiated thyroid carcinoma • MEN syndromes	-Didactic (lectures, seminars, tutorial) -Clinical rounds -Seminars -Clinical rotations -Service teaching	-OSCE at the end of each year -log book & portfolio - One MCQ examination at the second half of the second year and another one in the third year -Written and oral examination
D. Explain the facts and principles of the relevant basic supportive sciences related to Radio-isotopes therapy.		
E. Explain the facts and principles of the relevant clinically supportive sciences related to Radio-		

isotopes therapy.		
F. Describe the basic ethical and medicolegal principles revenant to the Radio-isotopes therapy.		
G. Describe the basics and measurements of quality assurance to ensure good clinical care in Radio-isotopes therapy.		
H. Explain the ethical and scientific principles of medical research.		
G. Explain the impact of common health problems in the field of Radio-isotopes therapy.on the society.		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Design and present case in common problem related to therapeutic nuclear medicine, topics mentioned in A.A unit 2	-Clinical rounds -Senior staff experience	-Procedure and case presentation -Log book & Portfolio
B. Apply the basic and clinically supportive sciences which are appropriate to the Radio-isotopes therapy.		
C. Demonstrate an investigatory and analytic thinking "problem – solving "approaches to clinical situation related to Radio-isotopes therapy.		
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 Radio-isotopes therapy.		
H. Create and innovate plans, systems, and other issues for improvement of performance in Radio-isotopes therapy.		
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 Radio-isotopes therapy.		

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Take history, examine and clinically diagnose different conditions related to Radio-isotopes therapy.	Lecture - Seminar - Outpatient -Inpatient -Case presentation -Direct observation	-OSCE at the end of each year -log book & portfolio - One MCQ examination at the second half of the second year and another one in the third year -Clinical exam
B. Order the following non invasive and invasive diagnostic procedures	-Clinical round with senior staff	- Procedure presentation

• Complete blood picture.
• Kidney function test.
• Thyroid function test.
• Other Lab tests according to the case
• Tumor markers :
  ○ Serum thyroglobulin , anti-thyroglobulin antibodies
  ○ Serum calcitonin
  ○ Norepinephrine metabolites
• Chest X ray.
• Neck sonography
• CT & MRI scans according to the case
• Fine needle aspiration& True cut needle biopsy
	-Observation
	-Post graduate teaching
	-Hand on workshops
	-Perform under supervision of senior staff
		- Log book
		- Chick list

C. Interpret the following non invasive and invasive diagnostic procedures : • Appropriate Lab investigations according to the case • Chest X ray. • Neck sonography • CT & MRI scans according to the case • Different diagnostic radionuclide procedures according to the case - Bone scintigraphy - Thyroid scintigraphy - I-131 WBS - MIBG Whole body scan - Tumor imaging (Thallium, Gallium, Tc99m MIBI, DMSA-V, ...) - PET and PET/CT studies -Sentinel lymph node localization	-Clinical round with senior staff -Observation -Post graduate teaching -Hand on workshops -Perform under supervision of senior staff	- Procedure presentation - Log book - Chick list
D. Perform the following non invasive and	-Clinical round with	- Procedure

invasive diagnostic procedures • Different diagnostic radionuclide procedures according to the case	senior staff -Observation -Post graduate teaching -Hand on workshops -Perform under supervision of senior staff	presentation - Log book - Chick list
E. Develop and Carry out patient management plans for the following problems • Diseases mentioned in A.A in Unit 2	-Clinical round with senior staff	
F. Counsel and educate patients and their family about • Procedure of receiving radionuclide therapy doses • Possible side effects of radionuclides and methods of management • Precautions in dealing with patients receiving radionuclide therapy	-Clinical round with senior staff	
G. Use information technology to support patient care decisions and patient education for the Radio-isotopes therapy.	-Clinical round with senior staff	
H. Provide health care services aimed at preventing the following conditions • Prevention of undue radiation exposure through use of radiation protection rules	-Clinical round with senior staff	
I. Work with health care professionals, including those from other disciplines, to provide patient-focused care for the	-Clinical round with senior staff	

following • Tracheostomy tube care • Disinfection • Caring wounds		
J. Write competently all forms of patient charts and sheets including reports evaluating these charts and sheets.(Write and evaluate a consultation note, Inform patients of a therapeutic plan, completing and evaluating comprehensive, timely and legible medical records)		

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 (Plan and conduct audit cycles) in the following problems: • Thyrotoxicosis • Differentiated thyroid cancer • Neuroblastoma, pheochromocytoma • Palliation of bone pain	-Simulations -Clinical round -Seminars -Lectures -Case presentation -Hand on workshops	- Global rating -Procedure & case presentation -Log book & Portfolios - Chick list
B. Locate, appraises, and assimilates evidence health problems mentioned in A.A. Unit 2	-Simulations -Clinical round -Seminars -Lectures	- Global rating -Procedure & case presentation -Log book & Portfolios

	-Case presentation -Hand on workshops	- Chick list
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	-Simulations -Clinical round -Seminars -Lectures -Case presentation -Hand on workshops	- Global rating -Procedure & case presentation -Log book & Portfolios - Chick list
G. Perform the following oral communications: a. Deal with patient relatives b. Ordering residents c. Ordering nurses		

H. Fill the following reports: • Patients' medical reports • Pre test sheet • Final comment on the results of the therapeutic Nuclear Medicine procedures • Write a consultation note • Maintaining comprehensive and eligible medical records		
I. Work effectively with others as a member or leader of a health care team • A member of a health care team in nuclear medicine inpatient unit • A leader of a health care team in night shift		

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.	- Observation - Senior staff experience - Case taking	-Objective structured clinical examination - 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.		- 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.	- Observation - Senior staff experience	- 360o global rating
N. Practice cost-effective health care and resource allocation that does not compromise quality of care		- 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: Second part

Topic	Covered ILOs			
	Knowledge A	Intellectual B	Practical skills C	General Skills D
Unit 1 Clinical Nuclear Medicine				
A.ENDOCRINE SYSTEM:				
➢ Thyroid scintigraphy				
• Indications of thyroid uptake studies and thyroid scans:				
-Thyrotoxicosis	A, B, D-I	A-I	A-I	A-P
-Goiter	A,B, D-I	A-I	A-I	A-P
-Thyroid nodules	A, B, D-I	A-I	A-I	A-P
-Ectopic thyroid tissue	A, B, D-I	A-I	A-I	A-P
-Thyroiditis	A, B, D-I	A-I	A-I	A-P
-Thyroid cancer	A, B, D-I	A-I	A-I	A-P
• Other thyroid function studies: T_3 suppression, TSH stimulation, Perchlorate discharge test	A, B, D-I	A-I	A-I	B-P
➢ Parathyroid scintigraphy	A,B, D-I	A-I	A-I	A-P
➢ Adrenal scintigraphy				
• Adreno-medullary scintigraphy	A,B, D-I	A-I	A-I	A-P
• Adreno-cortical scintigraphy	C-I	B-I	B-I	B-P
B.SKELETAL SCINTIGRAPHY:				
• Primary bone tumors	A,B, D-I	A-I	A-I	A-P

• Patterns of metastatic disease	A,B, D-I	A-I	A-I	A-P
• Metabolic bone disease	A,B, D-I	A-I	A-I	A-P
• Skeletal trauma	A,B, D-I	A-I	A-I	A-P
• Assessment of infection, Painful joint prosthesis	A,B, D-I	A-I	A-I	A-P
• Vascular manifestations	A,B, D-I	A-I	A-I	A-P
• Sport injuries	C-I	B-I	B-I	B-P
C.HEPATOBILIARY SYSTEM:				
➢ Cholescintigraphy				
- Acute and chronic cholecystitis	A, B, D-I	A-I	A-I	A-P
- Biliary duct obstruction	A, B, D-I	A-I	A-I	A-P
- Post operative biliary tract	A, B, D-I	A-I	A-I	A-P
➢ Tc-99m red blood cell liver scintigraphy	A, B, D-I	A-I	A-I	A-P
➢ Tc-99m sulphur colloid liver spleen imaging	A, B, D-I	A-I	A-I	A-P
➢ Tc-99m MAA hepatic arterial perfusion	A, B, D-I	A-I	A-I	A-P
D- GENITOURINARY SYSTEM:				
➢ Dynamic renal imaging, measuring renal function: GFR and ERPF				
• Obstructive uropathy	A,B,D-I	A-I	A-I	A-P
• Reno vascular hypertension	A,B,D-I	A-I	A-I	A-P
• Renal transplant evaluation	A,B,D-I	A-I	A-I	A-P
➢ Renal cortical imaging				
• Renal infection	A,B,D-I	A-I	A-I	A-P

• Renal failure	A,B,D-I	A-I	A-I	A-P
➢ Radionuclide cystography: Vesico-ureteric reflux	A,B,D-I	A-I	A-I	A-P
➢ Scrotal imaging	A,B,D-I	A-I	A-I	B-P
E- NUCLEAR MEDICINE IN TUMOR DIAGNOSIS:				
➢ Thallium-201, Tc-99m MIBI and Tc-99m tetrofosmin tumor imaging	A,B,D-I	A-I	A-I	B-P
➢ Ga-67 tumor imaging	A,B,D-I	A-I	A-I	B-P
➢ Peptide receptor imaging	B-I	B-I	B-I	B-P
➢ Monoclonal antibody imaging	B-I	B-I	B-I	B-P
➢ Lymphoscintigraphy	A,B,D-I	A-I	A-I	A-P
• Lymphatic mapping and sentinel LN detection	A,B,D-I	A-I	A-I	A-P
➢ Positron emission tomography clinical uses				
-Lung carcinoma	A, B,D-I	A-I	A-I	B-P
-Head and neck carcinoma	A, B,D-I	A-I	A-I	B-P
- Lymphoma	A, B,D-I	A-I	A-I	B-P
- Melanoma	A, B,D-I	A-I	A-I	B-P
- Others (colorectal, breast, ...)	A, B,D-I	A-I	A-I	B-P
F-GASTRO-INTESTINAL SYSTEM:				
• Gastrointestinal motility disorders	A, B,D-I	A-I	A-I	A-P
• GIT bleeding	A, B,D-I	A-I	A-I	A-P
• Intestinal transit time	B-I	B-I	B-I	B-P
• Heterotopic gastric mucosa	B-I	B-I	B-I	B-P
G-INFECTION AND INFLAMMATION:				

• Osteomyelitis	A, B,D-I	A-I	A-I	A-P
• Infected joint prosthesis	A, B,D-I	A-I	A-I	A-P
• Intra-abdominal infection	A, B,D-I	A-I	A-I	A-P
• Fever ofunknown origin	A, B,D-I	A-I	A-I	A-P
H-CENTRAL NERVOUS SYSTEM:				
➢ Clinical applications of cerebral scintigraphy:				
• Dementias	A, B, D-I	A-I	A-I	A-P
• Cerebro-vascular diseases	A, B, D-I	A-I	A-I	A-P
• Brain tumors	A, B, D-I	A-I	A-I	A-P
• Brain death	A, B, D-I	A-I	A-I	A-P
➢ Cisternography	A, B, D-I	A-I	A-I	A-P
➢ Blood brain barrier studies	B-I	B-I	B-I	B-P
➢ Brain imaging in epilepsy psychiatric disorders	B-I	B-I	B-I	B-P
I-CARDIAC SYSTEM:				
➢ Myocardial perfusion imaging				
• cardiac stress testing	A,B-D-I	A-I	A-I	A-P
• Diagnosis and evaluation of coronary artery disease	A,B-D-I	A-I	A-I	A-P
• Viability studies	A,B-D-I	A-I	A-I	A-P
• Prognosis and risk stratifications	A,B-D-I	A-I	A-I	A-P
• SPECT for congenital heart disease	B-I	B-I	B-I	B-P
➢ Radionuclide	A,B-D-I	A-I	A-I	A-P

ventriculography				
➢ Infarct avid imaging	A,B-D-I	A-I	A-I	A-P
➢ PET in Cardiology	B-I	B-I	B-I	B-P
➢ I-123 MIBG imaging of the heart	B-I	B-I	B-I	B-P
J-PULMONARY SYSTEM:				
• Pulmonary embolism Ventilation/perfusion scintigraphy	A,B-D-I	A-I	A-I	A-P
• Non-embolic lung disease	B-I	B-I	B-I	B-P
• assessment of human thrombosis and atheroma	B-I	B-I	B-I	B-P
APOPTOSIS IMAGING	B-I	B-I	B-I	B-P
HYPOXIA IMAGING	B-I	B-I	B-I	B-P
BASIC SIENCES				
• Radionuclide production	B,D-I	D,E	-	-
• Radio pharmacy	B,D-I	D,E	-	-
• Radio pharmaceuticals : pharmacokinetics, methods of tracer localization and excretion, target organs,.....	B,D-I	D,E	-	-
• Pathophysiology of diseases related to Nuclear Medicine Imaging studies	B,D-I	D,E	-	-
• Image methodology, interpretation, and possible artifacts	B,D-I	D,E	-	-
• Basic physics, detection and counting of radiation in nuclear medicine	B,D-I	D,E	-	-

• Single photon emission computed tomography	B,D-I	D,E	-	-
• Positron emission tomography	B,D-I	D,E	-	-
• Molecular imaging fundamentals	B,D-I	D,E	-	-
• Radiation protection and dosimetry in clinical practice	B,D-I	D,E	-	-
• Nuclear medicine computers	B,D-I	D,E	-	-
UNIT (Module)2: Radio-isotopes therapy.				
• Thyroid diseases:				
• Hyperthyroidism	A,D-F	A-J	A-J	A-P
• Secondary toxic goiter	A, D-F	A-J	A-J	A-P
• Autonomous toxic adenoma	A, D-F	A-J	A-J	A-P
• Differentiated thyroid carcinoma	A, D-F	A-J	A-J	A-P
• Neuro-endocrine tumors :				
○ Neuroblastoma	A,D-F	A-J	A-J	A-P
○ pheochromocytoma	A, D-F	A-J	A-J	A-P
○ Carcinoid	A, D-F	A-J	A-J	B-P
○ Medullary cancer thyroid	A, D-F	A-J	A-J	B-P
• Palliation of metastatic bone pain	A, D-F	A-J	A-J	A-P
• Radionuclide therapy of lymphoma	A, D-F	A-J	A-J	B-P
• Radionuclide therapy of primary and metastatic hepatic tumors	A, D-F	A-J	-	-
• Somatostatin receptor-targeted radiotherapy	A, D-F	A-J	-	-

• Intracoronary brachytherapy	A, D-F	A-J	-	-
• Radiation synovectomy	A, D-F	A-J	-	-
• Myeloproliferative diseases and their radionuclide treatment (polycythemia vera and essential thrombocythemia)	A, D-F	A-J	-	-
• Cancer cell biology: the basics for nuclear oncology imaging and therapy	B, D-F	A-J	-	-
• Principles of radionuclide therapy	B, D-F	A-J	-	-
• Dosimetric and radiobiological considerations	B, D-F	A-J	-	-
• Special considerations for pediatric patients	B, D-F	A-J	-	-
• Alternative approaches to targeting therapy	B, D-F	A-J	-	-
• Use of intra-operative probes in surgical oncology	B, D-F	A-J	-	-
• Undifferentiated thyroid carcinoma	C	E	-	-
• MEN syndromes	C	E	-	-

5. Methods of teaching/learning:

1. Didactic ; Lectures
2. Clinical rounds
3. Seminars Clinical rotations
4. (service teaching) Observation
5. Post graduate teaching
6. Hand on workshops
7. Perform under supervision of senior staff
8. Simulations
9. Case presentation
10. Case Taking

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

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

7. 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: at the end of the second part

iii. Marks: 1200 Degrees

8. List of references

i. Lectures notes

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

ii. Essential books

- **Nuclear Medicine: The Requisites.** James H. Thrall, Harvey A. Ziessman 2006, third edition
- **Nuclear Medicine in clinical diagnosis and treatment**. Peter J. ELL, Sanjiv Sam Gambhir-2004 Third edition.
- **Clinical Nuclear Medicine :** Gary J. R. Cook, Michael N. Maisey, Keith E. Britton. fourth edittion 2006
- **OrthopedicNM :** Abdelhamid H. Elgazzar Springer-Verlag Berlin Heidelberg , 2004 printed in Germany

iii. Recommended books

- **Nuclear Medicine therapy:** Janet F. Eary, Winfried Brenner, 2007
- **Targeted Radionuclide Tumor Therapy: Bilogical aspects:** Torgny Stigbrand, Jorgen Carlsson, Gregory P. Adams - 2008 .
- **Essentials of thyroid cancer managment**: Robert J. Amdur, Ernest L. Mazzaferri, 2005 Springer Science
- **Thyroid Cancer A Comprehensive Guide to Clinical Management:** L. Wartofsky, Douglas Van Nostrand Second Edittion,2006
- **Radiation Safety in Nuclear Medicine:** Max H. Lombardi – Second Edittion,2007
- **Basics of PET Imaging: Physics, Chemistry, and Regulations:** Gopal B. Saha, Springer Science+ Business Media , 2010
- **Clinical PET and PET/CT:** H. Jadvar, J. Anthony Parker, Springer Verlag London , 2005

- **Pediatric PET Imaging:** Martin Charron (MD.), Martin Charron - 2006

iv. Periodicals, Web sites, … etc

- The Journal of Nuclear medicine
- Journal of clinical Nuclear Medicine
- European Journal of Nuclear Medicine and Molecular Imaging
- www.snm.org
- www.pubmed.com
- www.eanm.org

v. others

- **Atlas of PET-CT, A Quick Guide to Image Interpretation** : By Stefano Fanti, Mohsen Farsad, Luigi Mansi, Springer Verleg-Berlin Heidlberg, 2009

9. Signatures

Course Coordinator: : Prof. Dr./ Mohamed A. Mekkawy	**Head of the Department:** Prof. Dr./ **Samir Shehata**
Date:	**Date:**

ANNEX 2
Program Academic Reference Standards (ARS)

1- Graduate attributes for medical doctorate *in Nuclear Medicine*

***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 Nuclear Medicine.

2- Have continuous ability to add knowledge to Nuclear Medicine 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 Nuclear Medicine.

7- Acquire an in depth understanding of common areas of Nuclear Medicine, 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 Nuclear Medicine.

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 system-based 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 Nuclear Medicine or one of its subspecialties.

15- Use recent technologies to improve his practice in Nuclear Medicine.

16- Share in updating and improving clinical practice in Nuclear Medicine.

2- Competency based Standards for medical doctorate in Nuclear Medicine.

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 Nuclear Medicine 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 Nuclear Medicine.

2-1-D- Principles and measurements of quality in Nuclear Medicine.

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 Nuclear Medicine related Problems.

2-2-B- Problem solving based on available data.

2-2-C- Involvement in research studies related to Nuclear Medicine.

2-2-D- Writing scientific papers.

2-2-E- Risk evaluation in the related clinical practice.

2-2-F- Planning for performance improvement in Nuclear Medicine.

2-2-G- Creation and innovation in Nuclear Medicine.

2-2-H- Evidence– based discussion.

2-2-I- Decision making in different situations related to Nuclear Medicine.

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 Nuclear Medicine.

2-3-B- Master patient care skills relevant to Nuclear Medicine.for patients with all diagnoses and procedures.

2-3-C- Write and evaluate reports for situations related to the Nuclear Medicine.

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.

- ***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.

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

Teaching methods for knowledge

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

Teaching methods for patient care

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

Teaching methods for other skills

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

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

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

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

Annex 4, Assessment methods

Annex 4, ILOs evaluation methods for MD students.

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

Annex 4, Glossary of 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 decision-making.

- Mini clinical evaluation: Evaluation of Live/Recorded Performance (single event) – A single resident interaction with a patient is evaluated using a checklist. The encounter may be videotaped for later evaluation.

- Standardized Patients (SP) – Simulated patients are trained to respond in a manner similar to real patients. The standardized patient can be trained to rate the 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 Unit	Reports Field visits	#
External Evaluator (s):According to department council External Examiner (s): According to department council	Reports Field visits	#
Stakeholders	Reports Field visits questionnaires	#
Senior students	questionnaires	#
Alumni	questionnaires	#

Annex 6, Program Correlations:

مصفوفة توافق المعايير القومية القياسية العامة لبرامج الدكتوراه مع المعايير الأكاديمية المعتمدة من كلية الطب – جامعة أسيوط لدرجة الدكتوراه في الطب النووي

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

1- Graduate attributes

Faculty ARS	NAQAAE General ARS for Postgraduate Programs
1- Demonstrate competency and mastery of basics, methods and tools of scientific research and clinical audit in Nuclear Medicine.	1-إتقان أساسيات و منهجيات البحث العلمي
2- Have continuous ability to add knowledge new developments to Nuclear Medicine through research and publication.	2-العمل المستمر علي الإضافة للمعارف في مجال التخصص
3- Appraise and utilise scientific knowledge to continuously update and improve clinical practice and relevant basic sciences.	3-تطبيق المنهج التحليلي والناقد للمعارف في مجال التخصص و المجالات ذات العلاقة
4- Acquire excellent level of medical knowledge in the basic biomedical, clinical, behavioural and clinical sciences, medical ethics and medical jurisprudence and apply such knowledge in patient care and scientific	4-دمج المعارف المتخصصة مع المعارف ذات العلاقة مستنبطا و مطورا للعلاقات البينية بينها
5- Function as a leader of a team to provide patient care that is appropriate, compassionate for dealing with effective and 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.	5-إظهار وعيا عميقا بالمشاكل الجارية و النظريات الحديثة في مجال التخصص
6- Identify and create solutions for health problems in Nuclear Medicine.	6-تحديد المشكلات المهنية و إيجاد حلولا 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 with health problems and health promotion. 7- Acquire an in depth understanding of common areas of Nuclear Medicine , from basic clinical care to evidence based clinical application, and possession of skills to manage independently all problems in these areas.	
16- Share in updating and improving clinical practice in Nuclear Medicine. 9- Function as teacher in relation to colleagues, medical students and other health professions.	8- التوجه نحو تطوير طرق و أدوات و أساليب جديدة للمزاولة المهنية
15- Use recent technologies to improve his practice in Nuclear Medicine.	9-استخدام الوسائل التكنولوجية المناسبة بما يخدم ممارسته المهنية
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. 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-التواصل بفاعلية و قيادة فريق عمل في سياقات مهنية مختلفة
10- Master decision making capabilities in different situations related to Nuclear Medicine.	11-اتخاذ القرار في ظل المعلومات المتاحة
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-توظيف الموارد المتاحة بكفاءة و تنميتها والعمل على إيجاد موارد جديدة
12- Demonstrate in depth awareness of public health and health policy issues including	13-الوعي بدوره في تنمية المجتمع والحفاظ

independent ability to improve health care, and identify and carryout system-based improvement of care.	على البيئة
13- Show model attitudes and professionalism.	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 Nuclear Medicine or one of its subspecialties. 15- Use recent technologies to improve his practice in Nuclear Medicine.	15-الالتزام بالتنمية الذاتية المستمرة و نقل علمه و خبراته للآخرين

2- Academic standards

Faculty ARS	NAQAAE General ARS for Postgraduate Programs
2.1. A- Established, updated and evidence- based theories, basics and developments of Nuclear Medicine and relevant sciences.	2-1-أ- النظريات و الأساسيات والحديث من المعارف في مجال التخصص والمجالات ذات العلاقة
2.1. B- Basic, methods and ethics of medical research.	2-1-ب -أساسيات و منهجيات و أخلاقيات البحث العلمي و أدواته المختلفة
2.1. C- Ethical and medicologal principles of medical practice related to Nuclear Medicine.	2-1-ج- المبادئ الأخلاقية و القانونية للممارسة المهنية في مجال التخصص
2.1. D- Principles and measurements of quality in Nuclear Medicine.	2-1-د مبادئ و أساسيات الجودة في الممارسة المهنية في مجال التخصص
2.1. E- Principles and efforts for maintains and improvements of public health.	2-1-هـ - المعارف المتعلقة بآثار ممارسته المهنية على البيئة وطرق تنمية البيئة وصيانتها
2.2. A- Application of basic and other relevant science to solve Nuclear Medicine related problems.	2-2-أ -تحليل و تقييم المعلومات في مجال التخصص و القياس عليها و الاستنباط منها
2.2.B- Problem solving based on available data.	2-2-ب -حل المشاكل المتخصصة استنادا علي المعطيات المتاحة
2.2.C- Involvement in research studies related to Nuclear Medicine.	2-2-ج -إجراء دراسات بحثية تضيف إلى المعارف
2.2. D- Writing scientific papers.	2-2-د- صياغة أوراق علمية
2.2. E- Risk evaluation in the related clinical practice.	2-2-هـ تقييم المخاطر في الممارسات المهنية
2.2.F- Planning for performance improvement in Nuclear Medicine.	2-2-و -التخطيط لتطوير الأداء في مجال التخصص

2-2-G- Creation and innovation in the Nuclear Medicine.	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 Nuclear Medicine.	2-2-ط -اتخاذ القـــرارات المهنيـــة فـــي 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 Nuclear Medicine. 2.3. B- Master patient care skills relevant to Nuclear Medicine 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 Nuclear Medicine.	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.	2-3-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 for Nuclear Medicine

(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 Nuclear Medicine 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 Nuclear Medicine field.	**2-1-C-** Mention ethical, medico logical principles and bylaws relevant to his practice in the field of Nuclear Medicine.
2-1-D- Principles and measurements of quality in the Nuclear Medicine field.	**2-1-D-** Mention principles and measurements of quality assurance and quality improvement in medical education and in clinical practice of Nuclear Medicine.
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 Nuclear Medicine.
***2-2- Intellectual skills*:**	***2-2- Intellectual skills:***
2-2-A-Application of basic and other	**2-2-A-** Apply the basic and clinically supportive

relevant science to solve Nuclear Medicine related problems.	sciences which are appropriate to Nuclear Medicine 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 Nuclear Medicine.
2-2-C- Involvement in research studies related to the Nuclear Medicine.	**2-2-C-** Plan 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 Nuclear Medicine field.	**2-2-F-** Plan for quality improvement in the field of medical education and clinical practice in Nuclear Medicine.
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 Nuclear Medicine fields.	**2-2-I-** Formulate management plans and alternative decisions in different situations in the field of the Nuclear Medicine.

continuous (ARS)	continuous (ILOs)
2-3- Clinical skills:	***2/3/1/Practical skills (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 his field of practice.	**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-B- Master patient care skills relevant to Nuclear Medicine for patients with all diagnoses and procedures.	**2-3-1-B-** Provide extensive level of patient care for patients with all common diagnoses and for uncomplicated procedures related to Nuclear Medicine.
	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 Nuclear Medicine
	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 Nuclear Medicine related situations.

	2-3-1-G- Gather essential and accurate information about patients of the Nuclear Medicine 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 Nuclear Medicine related conditions. **2-3-1-I-** Develop and carry out patient management plans for Nuclear Medicine related conditions. **2-3-1-J-** Counsel and educate patients and their families about Nuclear Medicine related conditions. **2-3-1-K-** Use information technology to support patient care decisions and patient education in all Nuclear Medicine related clinical situations. **2-3-1-L-** Perform competently all medical and invasive procedures considered essential for the Nuclear Medicine related conditions / area of practices. **2-3-1-M-** Provide health care services aimed at preventing the Nuclear Medicine related health problems. **2-3-1-N-** Lead health care professionals, including those from other disciplines, to provide patient-focused care in Nuclear Medicine related conditions**.**

2-3-C- Write and evaluate reports for situations related to the field of Nuclear Medicine.	**2-3-1-O-** Write competently all forms of patient charts and sheets including reports evaluating these charts and sheets.(Write and evaluate a consultation note, Inform patients of a diagnosis and therapeutic plan, completing and evaluating comprehensive timely and legible medical records).
2-4- General skills **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 General skills*** **2-3-2-A-** Demonstrate the competency of continuous evaluation of different types of care provision to patients in the different area of Nuclear Medicine. **2-3-2-B-** Appraise scientific evidence. **2-3-2-C-** Continuously improve patient care based on constant self-evaluation and life-long learning. **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 sources 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 on-line 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.	**2-3-2-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 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 manifested through a commitment to carrying out professional responsibilities, adherence to ethical	**2-3-2-P-** Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society.

principles, and sensitivity to a diverse patient population.	**2-3-2-Q-** Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices. **2-3-2-R-** Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities.
2-4-F- Demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively use system resources to provide care that is of optimal value. **2-4-G**- Participate in improvement of the education system.	**2-3-2-S-** Work effectively in health care delivery settings and systems related to Nuclear Medicine including good administrative and time management. **2-3-2-T-** Practice cost-effective health care and resource allocation that 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-S-** Work effectively in health care delivery settings and systems related to Nuclear Medicine including good administrative and time management.
2-4-O- Demonstrate skills of self and continuous learning .	From A to 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 Aspects and Ethics in Medical Practice and Scientific Research			✓		
Course 4 :Pathology	✓				
Course 5 : Internal Medicine	✓	✓	✓	✓	✓
Course 6 : General surgery	✓				
Course 7 : Nuclear Medicine	✓	✓	✓	✓	✓

Intellectual

Course	Program covered 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 Aspects and Ethics in Medical Practice and Scientific Research								✓	
Course 4 :Pathology	✓	✓							
Course 5: Internal Medicine	✓	✓							✓
Course 6: General surgery	✓								
Course 7: Nuclear Medicine	✓	✓	✓	✓	✓	✓	✓	✓	✓

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 Aspects and Ethics in Medical Practice and Scientific Research				✓				✓
Course 4 :Pathology								
Course 5: Internal Medicine								
Course 6: General surgery								
Course 7: Nuclear Medicine	✓	✓	✓	✓	✓	✓	✓	✓

Course	Program covered lLOs						
	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 Aspects and Ethics in Medical Practice and Scientific Research	✓	✓					✓
Course 4 :Pathology							
Course 5: Internal Medicine							
Course 6: General surgery							
Course 7: Nuclear Medicine	✓	✓	✓	✓	✓	✓	✓

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 Aspects and Ethics in Medical Practice and Scientific Research								
Course 4 :Pathology								
Course 5: Internal Medicine								
Course 6: General surgery								
Course 7: Nuclear Medicine	✓	✓	✓	✓	✓	✓	✓	✓

Course	Program covered ILOs							
	2/3/2/I	2/3/2/J	2/3/2/K	2/3/2/L	2/3/2/M	2/3/2/N	2/3/2/O	2/3/2/P
Course 1: Medical statistics	✓	✓	✓					
Course 2: Research Methodology	✓	✓						
Course 3 : Medicolegal Aspects and Ethics in Medical Practice and Scientific Research				✓				
Course 4 :Pathology			✓	✓				
Course 5: Internal Medicine			✓	✓				✓
Course 6: General surgery			✓	✓				✓
Course 7: Nuclear Medicine	✓	✓	✓	✓	✓	✓	✓	✓

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 Aspects and Ethics in Medical Practice and Scientific Research							
Course 4 :Pathology	✓		✓				
Course 5: Internal Medicine		✓	✓				
Course 6: General surgery			✓				
Course 7: Nuclear Medicine	✓	✓	✓	✓	✓	✓	✓

(End of the program specifications)